

वार्षिक प्रतिवेदन ANNUAL REPORT 2019-20

01 अप्रैल 2019 – 31 मार्च 2020
(01 APRIL 2019 – 31 MARCH 2020)



भारतीय प्रौद्योगिकी संस्थान
(भारतीय खनि विद्यापीठ), धनबाद
INDIAN INSTITUTE OF TECHNOLOGY
(INDIAN SCHOOL OF MINES), DHANBAD

Published in 2020 © IIT (ISM), Dhanbad

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From the DIRECTOR'S DESK



The end of this year marks the completion of my two years as the Director of this Institute, which is the halfway point of my tenure and I put it on record with pride that I was fortunate to see the growth and development of the IIT(ISM) community in a truly exceptional way.

I am pleased to report a strong operating performance for the year delivered. We updated and re-accredited several academic programmes, introduced new didactic approaches in the teaching process, including the integration of online courses in the curriculum, witnessed advancements in the field of research and also achieved success in developing the global network of the Institute.

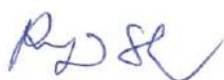
Since the launch of our new Strategy: IIT(ISM)@2026, we have only seen progress every passing year, with the efforts from everyone at the Institute. My broader vision for the Institute is to ensure that it advances steadily to register its presence among the top 200 leading knowledge enterprises in the world. I am grateful to all the people, who are constantly working towards achieving this goal.

I am happy to put on record that the much-anticipated project to develop a state-of-the-art-lab for promoting innovation culture on campus – *The Naresh Vashisht Centre for Tinkering and Innovation* – is now almost ready. I am delighted with this new development which is going to provide a wonderful innovation play workspace for our students, stimulating innovations combining science and technology. My thanks to all those who have helped to make it possible.

The past few months have truly been a roller-coaster ride for all of us. Despite the first quarter of the year having seen the onset of a global pandemic, we were able to overcome it and turn the tide to advance ourselves. The pandemic has disrupted the everyday lives of everyone across the globe and our institution has been no exception. It is a matter of pride that we made significant leaps in testing times like these. The Institute has undertaken some translational research for COVID-19 and emerged with successful projects that include safety systems to fight against it. In an unforeseen turn of events, the traditional methods of teaching have now been replaced with the online mode of education, to which we seamlessly adapted to, ensuring that circumstances like these cause no hindrances to the students' education.

The tireless efforts of the Institute in rendering the International Relations (IR) portal and the Alumni Affairs (AA) portal into existence, which aim at boosting the reputation of the Institute on an international stage and strengthening the bond between the esteemed alumni, will play a key role in unfolding new windows of opportunities for the Institute in the days to come.

Finally, IIT (ISM) remains committed to meeting the educational needs of our students and the well-being of the communities we serve. Excellence is what drives us. In doing so, I firmly believe that our steps will lead to success. I am highly confident that we shall either find a way or make one: *Aut inveniam viam aut faciam!* (Seneca).



(Prof. Rajiv Shekhar)
Director, IIT (ISM) Dhanbad

VISION

To be an internationally acclaimed premier institution of higher technical and scientific education with social commitment having an ethos for intellectual excellence, where initiative is nurtured, where new ideas, research and scholarship flourish and intellectual honesty is the norm, and from which will emerge the leaders and innovators of tomorrow in the realms of technology. While serving as a catalyst in a developing society, its goal as one of the premier technology education institution of the country would be to intimately involve itself not just in the technological development of the Nation but also in its overall development.

MISSION

- ❖ To educate and train manpower in various disciplines of engineering and technology, applied sciences, management and applied arts at the graduate, postgraduate and research levels.
- ❖ To foster the creation of new and relevant technologies in the areas of its core competency and to transfer them to industry for effective utilization.
- ❖ To participate directly in the planning and solving of engineering and managerial problems of relevance to industry and the society at large.
- ❖ To develop and conduct continuing education programmes for practicing engineers and managers.
- ❖ To develop strong collaborative and cooperative links with private and public-sector industries and government user departments.
- ❖ To develop comprehensive and intimate interaction with premier academic and research institutions within the country and abroad for mutual benefit.
- ❖ To develop programmes for faculty growth and development.
- ❖ To anticipate the technological needs of the Nation and to plan and prepare to cater to them.
- ❖ To interact with the community/society at large with a view to inculcate in them a feel for scientific and technological thoughts and endeavours.
- ❖ To develop the region in which the Institute is located through community development programmes including training and education.

Action Plan for the coming Academic Year 2020-21:

- 1. BOYS HOSTEL:** The present strength of male students in the campus is 6362 who have been accommodated in the hostel capacity of 3188 only i.e. utilization of existing boys' hostels is 199%. A 2000 seated boys' hostel is under construction which is likely to be completed in June 2021. Looking into the present scenario of over utilization of boys' hostels and additional intake due to implementation of EWS, Institute is proposing to construct one boys' hostel with 800 capacity.
- 2. FACULTY FLATS:** The present sanctioned strength of faculty is 781 and non-faculty is 859 against which filled positions are 327 and 235 respectively & 231 non-faculty positions are already advertised and further recruitment process is being conducted. Against total employee strength of 562, the available residential accommodations are 448 only. There is a shortage of faculty accommodation in the campus and Institute is unable to provide entitled accommodation to the faculty members who are joining the Institute. The upcoming 180 flats will be used for providing entitled accommodation to faculty members. The faculty recruitment process is on and it is expected that some new faculty will be joining the Institute. It is expected that 180 flats will be fully occupied in years to come. However, there is an urgent need of at least one more tower of 60 flats. Institute is going to initiate a proposal for the same.
- 3. SMART CLASSROOMS:** Institute is having one dedicated Lecture Hall Complex building and other lecture halls in different departments. None of the classrooms are equipped with smart classrooms gadgets. Smart Classrooms are technology enhanced classrooms that foster opportunities for teaching and learning by integrating learning technology, such as computers, specialized software, audience response technology, assistive listening devices, networking, and audio/visual capabilities. Institute is planning to equip some of the classrooms with smart classroom gadgets.
- 4. FACULTY MOBILITY PROGRAMME (FMP):** FMP is designed to encourage faculty members to spend two weeks in an industry leading to an industry sponsored project.
- 5. SANDWICH Ph.D. PROGRAMME:** Sandwich Ph.D. Programme is for PhD Students to provide them an opportunity to improve research abilities, and to establish and/or increase work opportunities in an international context where they can spend a minimum of six months in a top University or Laboratory of the world utilizing their contingency and Institute Support.
- 6.** To clear the back-log of recruitment of non-teaching staff and initiate the digitization of records.
- 7.** To improve the existing facilities in the Health Centre; facilitate more number of MoUs with reputed Hospitals in the country; and also to streamline the purchase and distribution of medicines.

Annual Report 2019-20

8. Emphasis is being given to recruit faculty not only with Ph.D. but also with Post-Doctoral experience. Moreover, focus is made for getting potential candidates with an International exposure in World's leading academic institutions.
9. To encourage faculty members to publish their research work in Q1 (quartile one) and Q2 (quartile two) journals of their respective fields. This may also lead to gain good citation of their published research work.
10. To develop new sports complex for students and other IIT(ISM) community/Flood lights in the Lower & Upper grounds/Renovation of Lower/Upper grounds.
11. To improve the existing facilities of outdoor synthetic basketball & tennis courts/hockey field with practice lights/ multipurpose indoor hall/reflooring of gymnasium.
12. Operationalization of Naresh Vashisht Centre for Tinkering and Innovation.
13. Organizing Grand Innovation Challenges, Hackathons including Samsung R&D Innovation Challenge for IITs and other Institution.
14. Formation of not-for-profit section 8 company in the Name of ACIC IIT (ISM) Dhanbad. Operationalization of Atal Community Innovation Centre (ACIC) with the funding from NITI Aayog.
15. Acknowledging Alumni for their significant contributions in supporting innovative student projects, internship programmes, infrastructure projects, Research Centre (Centre for Earth, Energy and Environmental Research (CEEER)), Centre for Advanced Computing and Simulation /Smart Class rooms/Modernization of Hostel Kitchens.
16. Initiate the invitation of nomination process for Distinguished Alumnus Award (DAA) and BASANT Samman and finalize the list of awardees for the year 2020. Awards to be conferred during BASANT 2021.
17. Finalizing the Umbrella MOUs with French Engineering Colleges; German Universities (Through DAAD), University of West Scotland, AGH University, Krakow, Poland, Kazimierz P University (Department of Electrical devices).
18. Organizing health awareness workshops (including menstrual hygiene workshop) and medical camp in nearby villages.
19. Promoting secondary education (school education) in Jharkhand by contributing innovation in teaching-learning methods/tools in association with state government of Jharkhand.
20. Operationalization of IIT (ISM) e-Merchandise Programme through Campus Mall.
21. Implementation of Online Teaching & Evaluation system.
22. Implementation of New Academic Programs under CBCS such as Minor, Double Major, Dual Degree.

PART - A

1. About (IIT) ISM, Dhanbad

1.1 Historical Purview, Campus and Objective

Historical Purview

Indian Institute of Technology (Indian School of Mines), Dhanbad was established in 1926 to address the need for trained manpower related to mining activities in the country with disciplines of Mining Engineering and Applied Geology. In 1967, it was granted status of a Deemed to be University under Section 3 of UGC Act, 1956. Over the last nine decades, IIT (ISM) has incorporated important core engineering disciplines and has acquired the status of a full-fledged institute of global standing for imparting higher education in engineering, science and management. The Institute has been conferred the status of Indian Institute of Technology (IIT) on 6th September 2016 by Government of India and has been renamed as Indian Institute of Technology (Indian School of Mines), Dhanbad.

Campus

Situated in the heart of the country's prime coking coal belt, 260 km from Kolkata with a campus spread over an area of 218 acres the fully residential IIT (ISM) has all the facilities of a world-class academic institute. What started as an institution to impart engineering education has steadily graduated into a full-fledged technical institution of national and international acclaim offering a host of programmes like Bachelor of Technology, Integrated Master of Technology, Master of Technology, Master of Science, Master of Science and Technology, and Master of Business Administration and awards Ph.D. Degree.

Objective

Since its inception and for more than nine decades, IIT(ISM) has been serving Indian industries in the Energy, Mining, Mineral and Petroleum sectors by providing high quality trained and specialized manpower in the form of Engineers, Scientists and Managers to develop and sustain the ever-increasing activities in these industrial sectors at various levels of Exploration, Exploitation, Management and Environmental Protection. In fact, it may be said with considerable confidence that a majority of the Mining and Mineral based industries in both the pre- and post- independence period of the nation have been planned and executed by the eminent alumni of IIT(ISM). The institute has also made an indelible mark for itself at the global level by providing quality trained technical manpower to the industry/academia in other contemporary engineering disciplines.

From the beginning, the Institute has had an all-India character and a national flavour. Admission to all undergraduate (UG) including 5 years integrated programme is through the IIT Joint Entrance Examination (IIT-JEE). Likewise, admissions to all its PG programmes including the Ph.D. programme are through either National level entrance tests like GATE, NET and CAT or, through ISM-conducted all-India level admission tests. Its faculty members have a national profile with performance being at par with that of well-established IITs in terms of various key performance parameters such as per faculty research contributions, the number of research publications, revenue outlay on industry sponsored consultancy projects for solving the real-life problems, laboratory testing assignments and the conduct of Executive Development Programmes for different industries.

About (IIT) ISM, Dhanbad

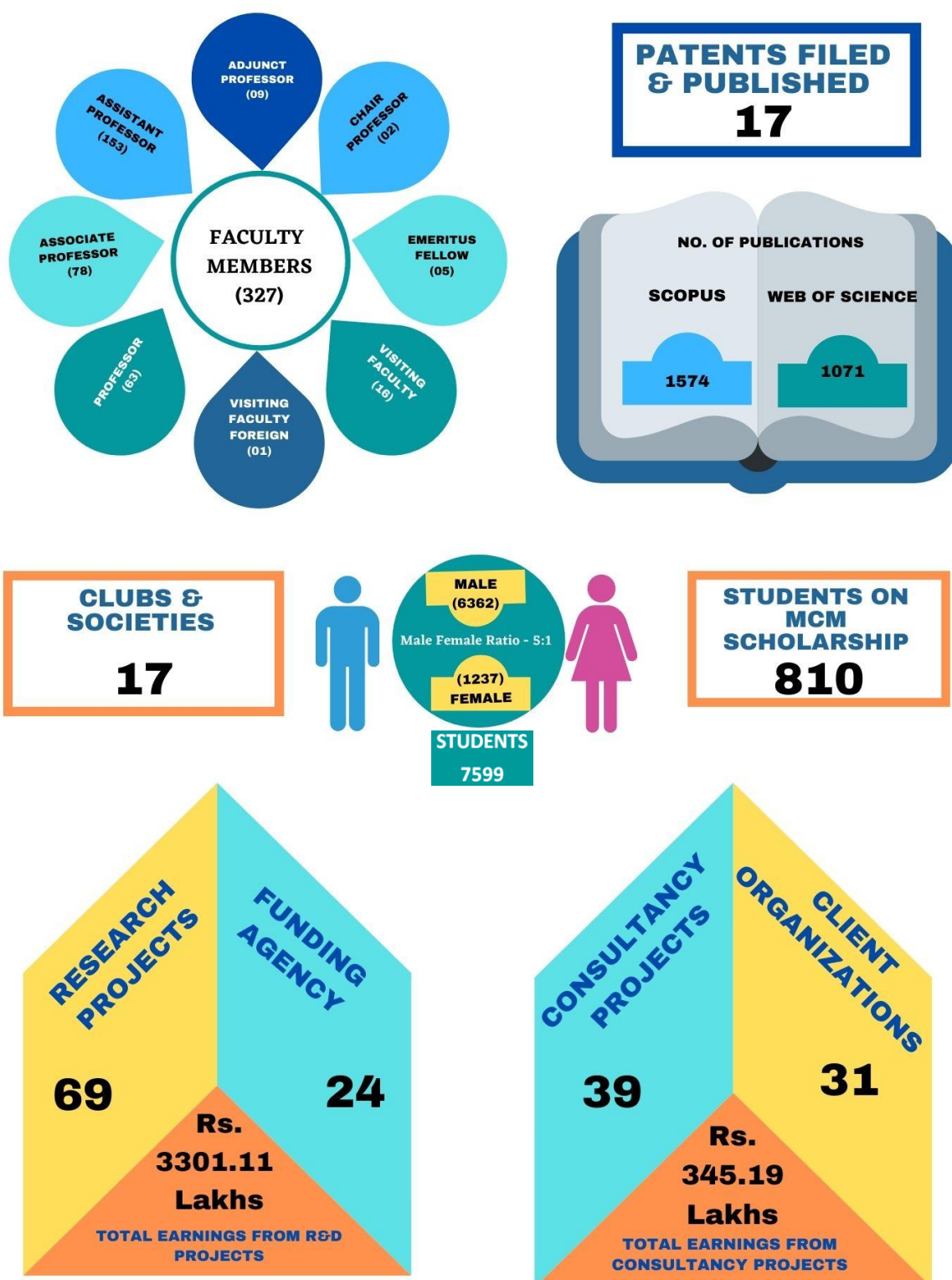
List of the departments in the Institute is as follow:

Department	Year of Establishment
Department of Applied Geology	1926
Department of Mining Engineering	1926
Department of Humanities and Social Science	1926
Department of Applied Geophysics	1957
Department of Petroleum Engineering	1957
Department of Mining Machinery Engineering	1975
Department of Fuel, Minerals and Metallurgical Engineering (Erstwhile Fuel and Mineral Engineering)	1976
Department of Management Studies (Erstwhile Industrial Engineering and Management)	1976
Department of Electronics Engineering	1977
Department of Chemistry (Erstwhile Applied Chemistry)	1989
Department of Physics (Erstwhile Applied Physics)	1989
Department of Mathematics and Computing (Erstwhile Applied Mathematics)	1989
Department of Computer Science and Engineering	1997
Department of Mechanical Engineering	1999
Department of Electrical Engineering	2005
Department of Environmental Science and Engineering	2007
Department of Chemical Engineering	2010
Department of Civil Engineering	2013

List of research centres in the Institute is as follow:

- Centre of Excellence in Safety, Occupational Health and Disaster Management
- Australia-India Joint Centre of Excellence in Mining Technology
- Centre of Advanced Study in Mining Engineering
- Centre for Rock Excavation Engineering
- Centre for Longwall Mine Mechanisation
- Centre for Climate Change and Atmospheric Studies
- Centre of Water Resource Management
- Key Resource Centre for Water and Sanitization
- Centre for Mining Environment
- Centre for Mineral Exploration
- Australia-India Joint Research Centre for Clean Coal and Energy Technology
- Reservoir Characterization Centre
- Centre of Policy Studies
- Centre of Excellence in Renewable Energy (CERE)
- Centre for Earth, Energy and Environmental Research (CEEER)

1.2 Info-graphics: Concurrent Purview



About (IIT) ISM, Dhanbad

1.3 Board of Governors

Chairman

Prof. D. D. Misra (upto 04/03/2020)
4, Arya Bhumi, Post - Patia, Bhubaneswar – 751024

Director (Ex-Officio)

Prof. Rajiv Shekhar
Director, IIT (ISM), Dhanbad – 826004

Council Nominees (Members)

Prof. Shailendra Singh
Director, Indian Institute of Management
Ranchi, Suchana Bhawan, Audrey House
Campus, Meur's Road, Ranchi - 834008,
Jharkhand

Prof. Pallab Banerji
Professor, Material Science Centre,
Indian Institute of Technology Kharagpur,
Kharagpur - 721302, West Bengal

Shri Gautam N. Mehra
Chairman & Managing Director
Savita Oil Technologies Limited, 66/67,
Nariman Bhavan, Nariman Point,
Mumbai - 400021, Maharashtra

Additional Secretary (TE) to the Govt. of India
Department of Higher Education,
Ministry of Human Resource Development,
Shastri Bhawan, New Delhi - 110015

Senate Nominees (Members)

Prof. N. R. Mandre (upto 31/12/2019)
Professor, Department of Fuel, Minerals and Metallurgical Engineering, IIT (ISM), Dhanbad

Prof. Rima Chatterjee (upto 31/12/2019)
Professor, Department of Applied Geophysics, IIT (ISM), Dhanbad

Prof. Subodh Kumar Maiti (from 01/01/2020)
Professor, Department of Environmental Science and Engineering, IIT (ISM), Dhanbad

Prof. Atul Kumar Varma (from 01/01/2020)
Professor, Department of Applied Geology, IIT (ISM), Dhanbad

State Government Nominees (Member)

Prof. Gopal Pathak
Vice Chancellor, Jharkhand University of Technology,
Science & Technology Campus, Sikh Roli, Namkum, Ranchi – 834010

Secretary

Dr. Pramod Mathur (upto 10/02/2020)
Registrar (Additional Charge), IIT (ISM), Dhanbad

Prof. Devendra Deo Pathak (from 11/02/2020)
Registrar (Additional Charge), IIT (ISM), Dhanbad

1.4 Finance Committee

Chairman

Prof. D. D. Misra
4, Arya Bhumi, Post - Patia, Bhubaneswar – 751024

(upto 04/03/2020)

Director (Ex-Officio)

Prof. Rajiv Shekhar
Director, IIT (ISM), Dhanbad – 826004

Nominated By BOG (Members)

Prof. Shailendra Singh
Director, Indian Institute of Management,
Suchana Bhawan, Audrey House Campus,
Meur's Road, Ranchi - 834008, Jharkhand

Prof. Pallab Banerji
Professor, Material Science Centre,
Indian Institute of Technology Kharagpur,
Kharagpur - 721302, West Bengal

Prof. Rima Chatterjee **(upto 31/12/2019)**
Professor, Department of Applied Geophysics,
IIT(ISM), Dhanbad

Prof. Atul Kumar Varma **(from 01/01/2020)**
Professor, Department of Applied Geology,
IIT(ISM), Dhanbad

Central Government Nominees (Members)

Additional Secretary (TE) to the Govt. of India
Department of Higher Education,
Ministry of Human Resource Development,
Shastri Bhawan, New Delhi – 110015

Joint Secretary & Financial Advisor
Department of Higher Education,
Integrated Finance Division,
Ministry of Human Resource Development,
Shastri Bhawan, New Delhi - 110015

Secretary

Dr. Pramod Mathur
Registrar (Additional Charge), IIT (ISM), Dhanbad

(upto 10/02/2020)

Prof. Devendra Deo Pathak
Registrar (Additional Charge), IIT (ISM), Dhanbad

(from 11/02/2020)

About (IIT) ISM, Dhanbad

1.5 The Senate

S. No.	Name of Members	
(a)	Prof. Rajiv Shekhar, Director	Chairman
(b)	Prof. J. K. Pattanayak, Deputy Director	Member
(c)	Professors	
1.	Prof. D. C. Panigrahi, Dept. of Mining Engineering	Member
2.	Prof. Gurdeep Singh, Dept. of Environmental Science and Engineering	Member
3.	Prof. R. Venugopal, Dept. of Fuel, Minerals and Metallurgical Engineering	Member
4.	Prof. U. K. Singh, Dept. of Mining Engineering	Member
5.	Prof. T. Kumar, Dept. of Petroleum Engineering	Member
6.	Prof. M. Jawed, Dept. of Mining Engineering	Member
7.	Prof. S. K. Paul, Dept. of Electronics Engineering	Member
8.	Prof. S. Mohanty, Dept. of Applied Geology	Member
9.	Prof. B. C. Sarkar, Dept. of Applied Geology	Member
10.	Prof. A. K. Pathak, Dept. of Petroleum Engineering	Member
11.	Prof. P. Pathak, Dept. of Management Studies	Member
12.	Prof. Chandan Bhar, Dept. of Management Studies	Member
13.	Prof. J. Manam, Dept. of Physics	Member
14.	Prof. N. Suresh, Dept. of Fuel, Minerals and Metallurgical Engineering	Member
15.	Prof. K. Dasgupta, Dept. of Mining Machinery Engineering	Member
16.	Prof. A. K. Mukhopadhyay, Dept. of Mining Machinery Engineering	Member
17.	Prof. V. M. S. R. Murthy, Dept. of Mining Engineering	Member
18.	Prof. Sumantra Bhattacharya, Dept. of Fuel, Minerals and Metallurgical Engineering.	Member
19.	Prof. P. R. Mohanty, Dept. of Applied Geophysics	Member
20.	Prof. A. K. Varma, Dept. of Applied Geology	Member
21.	Prof. V. K. Saxena, Dept. of Chemical Engineering	Member
22.	Prof. N. R. Mandre, Dept. of Fuel, Minerals and Metallurgical Engineering	Member
23.	Prof. G.P. Biswas, Dept. of Computer Science and Engineering.	Member
24.	Prof. Subrata Bhattacharya, Dept. of Electronics Engineering	Member
25.	Prof. G. Udayabhanu, Dept. of Chemistry	Member
26.	Prof. S. Gupta, Dept. of Mathematics & Computing	Member
27.	Prof. G. N. Singh, Dept. of Mathematics & Computing	Member
28.	Prof. Somnath Pan, Dept. of Electrical Engineering	Member
29.	Prof. D. D Pathak, Dept. of Chemistry	Member
30.	Prof. A. S. Venkatesh, Dept. of Applied Geology	Member
31.	Prof. P. K. Jana, Dept. of Computer Science and Engineering	Member
32.	Prof. Shalivahan, Dept. of Applied Geophysics	Member

S. No.	Name of Members	
33.	Prof. D. Mitra, Dept. of Electronics Engineering	Member
34.	Prof. P. K. Sadhu, Dept. of Electrical Engineering	Member
35.	Prof. R. K. Das, Dept. of Mechanical Engineering	Member
36.	Prof. S. K Maity, Dept. of Environmental Science and Engineering	Member
37.	Prof. G. S. Pathak, Dept. of Management Studies	Member
38.	Prof. R. K. Upadhyay, Dept. of Mathematics & Computing	Member
39.	Prof. Anil Kumar Nirala, Dept. of Physics	Member
40.	Prof. Vineet Kumar, Dept. of Chemical Engineering	Member
41.	Prof. S. C. Dutta, Dept. of Civil Engineering	Member
42.	Prof. Rima Chatterjee, Dept. of Applied Geophysics	Member
43.	Prof. A. K. Mishra, Dept. of Mining Engineering	Member
44.	Prof. S. K. Gupta, Dept. of Environmental Science and Engineering	Member
45.	Prof. P. K. Khan, Dept. of Applied Geophysics	Member
46.	Prof. Satish Kumar Sinha, Chairman, Career Development Center	Member
47.	Prof. Biswajit Choudhary, Dept. of Chemistry	Member
48.	Prof. Ashutosh Kumar, Dept. of Petroleum Engineering	Member
49.	Prof. Chiranjeev Kumar, Dept. of Computer Science and Engineering	Member
50.	Prof. Dheeraj Kumar, Dept. of Mining Engineering	Member
51.	Prof. M. K. Singh, Dept. of Mathematics & Computing	Member
52.	Prof. S. K. Das, Dept. of Civil Engineering	Member
53.	Prof. S. Chaterjee, Dept. of Mathematics & Computing	Member
54.	Prof. Vikas Mahto, Dept. of Petroleum Engineering	Member
55.	Prof. Keka Ojha, Dept. of Petroleum Engineering	Member
56.	Prof. Ajay Mandal, Dept. of Petroleum Engineering	Member
57.	Prof. Akhilesh Prasad, Dept. of Mathematics & Computing	Member
58.	Prof. Vineet Kumar Rai, Dept. of Physics	Member
59.	Prof. Jitendra Kumar, Dept. of Electronics Engineering	Member
60.	Prof. Bobby K Antony, Dept. of Physics	Member
61.	Prof. V. Kumar, Dept. of Electronics Engineering	Spl. Invitee
62.	Prof. T. K. Chatterjee, Dept. of Mining Machinery Engineering	Spl. Invitee
63.	Prof. G. S. Seth, Dept. of Mathematics & Computing	Spl. Invitee
64.	Prof. R. M. Bhattacharya, Mining Engineering	Spl. Invitee
65.	Prof. D. Asthana, Dept. of Applied Geology	Spl. Invitee
66.	Prof. Rakesh Kumar, Dept. of Fuel, Minerals and Metallurgical Engineering.	Spl. Invitee
67.	Prof. Om Prakash, Dept. of Mining Engineering	Spl. Invitee
68.	Prof. S. C. Bhowmik, Dept. of Mining Engineering	Spl. Invitee
69.	Prof. S. S. Rai, Dept. of Mining Engineering	Spl. Invitee

About (IIT) ISM, Dhanbad

S. No.	Name of Members	
(d) Three person nominated by Chairman, BOG for a period of 2 years		
1.	Dr. Pradeep Kumar Singh, Director, CSIR-CIMFR Dhanbad	External Members
2.	Prof. (Dr.) D. K. Singh, Director, BIT Sindri, Dhanbad	
3.	Prof. Utpal Baul, Professor, BIT Mesra, Mesra, Ranchi	
(e) Head of All Departments/Centres (other than Professors)		
1.	Prof. Mahendra Yadav, HOD, Dept. of Chemistry	Member
2.	Prof. Haider Banka, HOD, Dept. of Computer Science & Engineering	Member
3.	Prof. Rajni Singh, HOD, Dept. of Humanities & Social Sciences	Member
4.	Prof. S. N. Singh, HOD, Dept. of Mechanical Engineering	Member
5.	Prof. L. A Kumaraswamidhas, HOD, Dept. of Mining Machinery Engineering	Member
6.	Prof. Kalyan Chatterjee, HOD, Dept. of Electrical Engineering	Member
7.	Prof. Saumya Singh, HOD, Dept. of Management Studies	Member
8.	Prof. S. K. Sharma, HOD, Dept. of Physics	Member
Head of Academic Centers		
1.	Prof. Anup Krishna Prasad, Centre for Climate Change and Atmosphere Studies	Member
2.	Prof. Mukul Kumar Das, Centre of Excellence in Renewable Energy	Member
3.	Prof. Sagar Pal, Central Research Facility	Member
(f) Associate Deans other than Professors		
1.	Prof. Alok Sinha, Assoc. Dean (Infra)- Planning & Projects, Dept. of Environmental Science and Engineering	Member
2.	Prof. A. R. Dixit, Assoc. Dean (Infra)-Campus Management, Dept. of Mechanical Engineering	Member
3.	Prof. S. P. Tiwari, Assoc. Dean (SW)-Hostel Management, Dept. of Mathematics & Computing	Member
4.	Prof. K. K. Singh, Assoc. Dean (Monitoring & Review), Dept. of Mechanical Engineering	Member
5.	Prof. Rajeev Upadhyay, Assoc. Dean (IRRA)-Alumni Affairs, Dept. of Petroleum Engineering	Member
6.	Prof. Vivekananda Mukharjee, Assoc. Dean (Academic)-PG, Dept. of Electrical Engineering	Member
7.	Prof. Chandan Guria, Assoc. Dean (Administration), Dept. of Petroleum Engineering	Member
8.	Prof. Ashis Mallick, Assoc. Dean (SW)-Scholarships, Insurance and Welfare Activities, Dept. of Mechanical Engineering	Member
9.	Prof. Pankaj Mishra, Assoc. Dean (IRAA)-Innovation & Incubation, Dept. of Physics	Member
10.	Prof. R. K. Gangwar, Assoc. Dean (R&D)-Sponsored Research, Dept. of Electronics Engineering	Member

S. No.	Name of Members	
11.	Prof. Badam Singh Kushvah, Assoc. Dean (Information Systems)-Networking & Automation, Dept. of Mathematics & Computing	Member
12.	Prof. Abhishek Kumar Singh, Assoc. Dean (Information Systems)-Automation, Dept. of Mathematics & Computing	Member
13.	Prof. Rohith P. John, Assoc. Dean (Academic)-Administration & Coordination, Dept. of Chemistry	Member
14.	Prof. Sahendra Singh, Assoc. Dean (Faculty)- Selection Career Progression, Dept of Applied Geology	Member
(g)	Librarian	
1.	Dr. Partha De	Member
(h)	One Chief Warden by rotation to be nominated by the Director for a period of one year with effect from 21.12.2018	
	Prof. A. C. S. Rao, Chief Warden, Dept. of Computer Science and Engineering	Member
(i)	Four Academic staff nominated by Chairman, BOG for a period of 2 years from 24.05.2018	
1.	Prof. H. P. Nayek, Assoc. Professor, Dept. of Chemistry	Member
2.	Prof. Sukanta Das, Assistant Professor, Dept. of Electrical Engineering	Member
3.	Prof. Sheeja Jagadevan, Assistant Professor, Dept. of Environmental Science and Engineering	Member
4.	Prof. Md. Irfan, Assistant Professor, Dept. of Management Studies	Member
(j)	Students representatives as invitees:	
1.	Mr Nikhil Swaraj, President, SG, 16JE001873	Invitee
2.	Mr. Aranya Samaiyar, Chairperson, SG, 16JE002055	Invitee
(k)	Registrar	
1.	Dr. Pramod Mathur	Secretary

About (IIT) ISM, Dhanbad

1.6 Administration

Prof. Rajiv Shekhar, Director
Prof. J. K. Pattanayak, Deputy Director

Academic Administration

Prof. G. Udayabhanu, Dean (Academic)
Prof. Rohith P. John, Associate Dean (Academic) - Administration and Coordination
Prof. Vivekananda Mukherjee, Associate Dean (Academic) – Postgraduate
Prof. Saumya Singh, Associate Dean (Academic) - Undergraduate (**upto 30/04/2019**)
Prof. Keka Ojha, Associate Dean (Academic) - Undergraduate (**from 01/05/2019**)

General Administration

Prof. D. D. Pathak, Dean (Administration)
Prof. Chandan Guria, Associate Dean (Administration)

Faculty Affairs

Prof. Jairam Manam, Dean (Faculty)
Prof. Subhasis Chatterjee, Associate Dean (Faculty) – Recruitment
Prof. Atul Kumar Varma, Associate Dean (Faculty) - Selection & Career Progression (**upto 09/01/2020**)
Prof. Sahendra Singh, Associate Dean (Faculty) - Selection & Career Progression (**from 10/01/2020**)

Information System

Prof. Chiranjeev Kumar, Dean (Information System)
Prof. Abhishek Kumar Singh, Associate Dean (Information System) - Automation
Prof. Badam Singh Kushvah, Associate Dean (Information System) - Network & Systems

Infrastructure

Prof. J. K. Pattanayak, Dean (Infrastructure)
Prof. Amit Rai Dixit, Associate Dean (Infrastructure) - Campus Management
Prof. Alok Sinha, Associate Dean (Infrastructure) - Planning & Projects

International Relations and Alumni Affairs

Prof. Dheeraj Kumar, Dean (International Relations and Alumni Affairs)
Prof. Rajeev Upadhyay, Associate Dean (IRAA) - Alumni Affairs
Prof. Pankaj Mishra, Associate Dean (IRAA) - Innovation & Incubation
Prof. Biswajit Chowdhury, Associate Dean (IRAA) - International Relation

Monitoring & Review

Prof. K. K. Singh, Associate Dean (Monitoring & Review)

Research & Development

Prof. Shalivahan, Dean (Research & Development)

Prof. Sagar Pal, Associate Dean (R&D) - Research Infrastructure

Prof. Ravi Kumar Gangwar, Associate Dean (R&D) - Sponsored Research

Students Welfare

Prof. M. K. Singh, Dean (Students Welfare)

Prof. S. P. Tiwari, Associate Dean (Students Welfare) - Hostel Management

Prof. Ashis Mallick, Associate Dean (Students Welfare) - Scholarship, Insurance & Welfare

Prof. Bobby K. Antony, Associate Dean (Students Welfare) - Students Activities

2. Performance Highlights

2.1 Rankings



ATAL RANKING OF INSTITUTIONS ON INNOVATION ACHIEVEMENTS



IIT (ISM), Dhanbad is categorized as 'Band A' institution (rank between 11-25) in category of 'Institute of National Importance, Central Universities & CFTIs' in ARIIA-2020.

Performance Highlights

2.2 Admissions

Programmes Offered:

The Institute offers 12 numbers of B. Tech Courses in different disciplines of Chemical Engineering, Civil Engineering, Computer Science, Electrical Engineering, Electronics and Communication Engineering, Engineering Physics, Environmental Science and Engineering, Mechanical Engineering, Mineral Engineering, Mining Engineering, Mining Machinery Engineering and Petroleum Engineering. It also offers five year Integrated M.Tech in Applied Geology, Applied Geophysics and Mathematics & Computing. Admission to these courses is done by Joint Entrance Examination (Advanced).

The Institute offers 29 numbers of M. Tech Courses in various streams offered by different departments. Admission to all these 2 year M. Tech Courses are done through GATE Examination conducted at All India level. The Institute also offers 3 year M.Sc. Tech courses in Applied Geology and Applied Geophysics, 2 year M.Sc. courses in Physics, Chemistry and Mathematics & Computing. Admission to these courses are based on JAM Score (Joint Admission Test for M. Sc) held at All India Level. 2 year M.B.A. Programme is also offered where the admission is based on combined scores of CAT and personal interview/ group discussion of candidates.

The Institute offers research opportunities in various disciplines of 18 departments. Admission to PhD is done through NET/JRF/Internal Examinations. The Post-Doctoral Fellowships (PDFs) and Quality Improvement Programme (QIP) opportunities are also available in the Institute for a maximum period of three years.

Admissions in various programmes during the Academic Year 2019-20:

4 Year Bachelor of Technology				
S. No.	Name of the Discipline	Academic Year of its Inception	Sanctioned Strength A.Y. 2019-20	Students Admitted A.Y. 2019-20
1	Chemical Engineering	2011	46	44
2	Civil Engineering	2013	59	57
3	Computer Science and Engineering	1988	117	116
4	Electrical Engineering	2006	103	101
5	Electronics and Communication Engineering	1988	103	103
6	Engineering Physics	2014	27	25
7	Environmental Engineering	2006	40	33
8	Mechanical Engineering	1999	111	108
9	Mineral Engineering	1984	37	31
10	Mining Engineering	1926	100	99
11	Mining Machinery Engineering	1975	49	44
12	Petroleum Engineering	1957	77	75
		Total	869	836

5 Year Integrated Master of Technology				
S. No.	Name of the Discipline	Academic Year of its Inception	Sanctioned Strength A.Y. 2019-20	Students Admitted A.Y. 2019-20
1	Applied Geology	2014	18	14
2	Applied Geophysics	2014	19	18
3	Mathematics and Computing	2012	46	45
		Total	83	77

3 Year Master of Science and Technology				
S. No.	Name of the Discipline	Academic Year of its Inception	Sanctioned Strength A.Y. 2019-20	Students Admitted A.Y. 2019-20
1	Applied Geology	1926	54	53
2	Applied Geophysics	1957	44	34
		Total	98	87

2 Year Master of Science				
S. No.	Name of the Discipline	Academic Year of its Inception	Sanctioned Strength A.Y. 2019-20	Students Admitted A.Y. 2019-20
1	Chemistry	2006	54	47
2	Mathematics and Computing	2000	44	37
3	Physics	2006	44	38
		Total	142	122

2 Year Master of Business Administration				
S. No.	Name of the Discipline	Academic Year of its Inception	Sanctioned Strength A.Y. 2019-20	Students Admitted A.Y. 2019-20
1	Master of Business Administration	1997	62	23
		Total	62	23

Performance Highlights

2 Year Master of Technology				
S. No.	Name of the Discipline	Academic Year of its Inception	Sanctioned Strength A.Y. 2019-20	Students Admitted A.Y. 2019-20
1	Chemical Engineering	2014	21	16
2	Communication and Signal Processing	2018	21	9
3	Computer Science and Engineering	2012	42	20
4	Computer Science and Engineering (Spl: Information Security)	2014	40	16
5	Data Analytics	2019	15	7
6	Earthquake Science and Engineering	2015	21	13
7	Engineering Geology	1983	14	9
8	Environmental Science & Engineering	1989	35	24
9	Fuel Engineering	1978	15	9
10	Geoexploration	2019	16	8
11	Geomatics	2005	15	5
12	Geotechnical Engineering	2018	15	12
13	Industrial Engineering & Management	1977	34	14
14	Mechanical Engineering (Spl: Machine Design)	2012	34	19
15	Mechanical Engineering (Spl: Maintenance Engineering & Tribology)	1999	20	11
16	Mechanical Engineering (Spl: Manufacturing Engineering)	2012	33	22
17	Mechanical Engineering (Spl: Thermal Engineering)	2014	38	19
18	Mineral Engineering	1976	23	6
19	Mining Engineering	2004	15	9
20	Mining Machinery Engineering	1999	23	15
21	Opencast Mining	2014	15	8
22	Optoelectronics and Optical Communication Engineering	2018	21	11
23	Petroleum Engineering	1983	32	27
24	Power Electronics and Electrical Drives	2014	33	19
25	Power System Engineering	2012	33	21
26	RF & Microwave Engineering	2016	15	9
27	Structural Engineering	2015	21	10
28	Tunnelling & Underground Space Technology	2006	15	6
29	VLSI Design	2018	26	17
		Total	701	391

Student Strength of various programmes during the Academic Year 2019-20:

Total Student Strength in 4 year B. Tech Programme 2019-20						
S. No.	Discipline	Year				Total
		I	II	III	IV	
1	Chemical Engineering	45	37	27	22	131
2	Civil Engineering	57	47	46	43	193
3	Computer Science & Engineering	118	124	154	159	555
4	Electrical Engineering	101	95	96	96	388
5	Electronics & Communication Engineering	103	104	107	109	423
6	Electronics & Instrumentation Engineering	0	32	40	29	101
7	Engineering Physics	26	19	16	10	71
8	Environmental Engineering	36	30	25	23	114
9	Mechanical Engineering	109	107	121	111	448
10	Mineral Engineering	34	34	21	29	118
11	Mining Engineering	104	83	62	75	324
12	Mining Machinery Engineering	50	46	25	33	154
13	Petroleum Engineering	76	69	72	58	275
Total		859	827	812	797	3295
Male		708	714	748	755	2925
Female		151	113	64	42	370
General		418	410	392	400	1620
OBC		230	245	221	220	916
SC		130	127	128	107	492
ST		81	45	71	70	267
EWS		86	0	0	0	86
PwD		12	7	14	13	46

Total Student Strength in 5 year Dual Degree Programme 2019-20							
S. No.	Discipline	Year					Total
		I	II	III	IV	V	
1	B. Tech (Computer Science and Engg.) + M. Tech (Computer Science and Engg.)	-	21	20	21	19	81
2	B. Tech (Mining Engg.) + M. Tech (Mining Engg.)	-	-	1	2	8	11
3	B. Tech (Mineral Engg.) + M. Tech (Mineral Engg.)	-	-	-	1	6	7
Total		-	21	21	24	33	99
Male		-	18	21	24	32	95
Female		-	3	0	0	1	4
General		-	12	10	13	15	50
OBC		-	5	7	5	11	28
SC		-	3	3	5	6	17
ST		-	1	1	1	1	4
EWS		-	0	0	0	0	0
PwD		-	0	1	1	2	4

Performance Highlights

Total Student Strength in 5 year Integrated M. Tech Programme 2019-20							
S. No.	Discipline	Year					Total
		I	II	III	IV	V	
1	Integrated M. Tech (Applied Geology)	15	12	9	10	7	53
2	Integrated M. Tech (Applied Geophysics)	18	10	10	8	7	53
3	Integrated M. Tech (Mathematics and Computing)	46	44	48	43	43	224
Total		79	66	67	61	57	330
Male		63	58	61	56	53	291
Female		16	8	6	5	4	39
General		41	39	32	33	31	176
OBC		18	16	19	15	17	85
SC		13	8	9	10	9	49
ST		7	3	7	3	0	20
EWS		12	0	0	0	0	12
PwD		0	0	3	0	1	3

Total Student Strength in 2 year M. Sc. Programme 2019-20				
S. No.	Discipline	Year		Total
		I	II	
1	Chemistry	47	46	93
2	Mathematics and Computing	37	32	69
3	Physics	38	32	70
Total		122	110	232
Male		95	87	182
Female		27	23	50
General		63	51	114
OBC		31	34	65
SC		17	15	32
ST		11	10	21
EWS		0	0	0
PwD		2	1	3

Total Student Strength in 2 year M. Sc. Tech Programme 2019-20					
S. No.	Discipline	Year			Total
		I	II	III	
1	Applied Geology	53	48	69	170
2	Applied Geophysics	34	35	39	108
Total		87	83	108	278
Male		64	58	83	205
Female		23	25	25	73
General		46	32	49	127
OBC		21	30	35	86
SC		14	14	16	44
ST		6	7	8	21
EWS		0	0	0	0
PwD		1	0	0	1

Total Student Strength in 2 year M. Tech Programme 2019-20				
S. No.	Discipline	Year		Total
		I	II	
1	Chemical Engineering	16	11	27
2	Communication & Signal Processing	9	14	23
3	Computer Science & Engineering	20	31	51
4	Computer Science & Engineering (Spl. In Information Security)	16	33	49
5	Data Analytics	7	0	7
6	Earthquake Science & Engineering	13	16	29
7	Engineering Geology	9	9	18
8	Environmental Science & Engineering	24	35	59
9	Fuel Engineering	9	8	17
10	Geoexploration	8	0	8
11	Geomatics	5	6	11
12	Geotechnical Engineering	12	12	24
13	Industrial Engineering & Management	14	29	43
14	Mechanical Engineering (Spl: Maintenance Engineering & Tribology)	11	32	43
15	Mechanical Engineering (Spl. Machine Design)	19	24	43
16	Mechanical Engineering (Spl. Manufacturing Engineering)	22	24	46
17	Mechanical Engineering (Spl. Thermal Engineering)	19	27	46
18	Mine Electrical Engineering	0	10	10
19	Mineral Engineering	6	10	16
20	Mineral Exploration	0	3	3
21	Mining Engineering	9	5	14
22	Mining Machinery Engineering	15	25	40
23	Opencast Mining	8	7	15
24	Optoelectronics & Optical Communication Engineering	11	16	27
25	Petroleum Engineering	27	30	57
26	Petroleum Exploration	0	4	4
27	Power Electronic & Electrical Drives	19	25	44
28	Power System Engineering	21	24	45
29	RF & Microwave Engineering	9	9	18
30	Structural Engineering	10	19	29
31	Tunnelling & Underground Space Technology	6	5	11
32	VLSI Design	17	18	35
Total		391	521	912
Male		344	458	802
Female		47	63	110
General		180	248	428
OBC		124	167	291
SC		58	78	136
ST		29	28	57
EWS		18	0	18
PwD		0	3	3

Total Student Strength in 2 year MBA Programme 2019-20									
S. No.	Year	Total	Male	Female	General	OBC	SC	ST	PwD
1	I	23	19	4	16	4	1	2	3
2	II	44	31	13	29	9	5	1	0
Total		67	50	17	45	13	6	3	3

Performance Highlights

Total Student Strength in Ph.D. Programme 2019-20										
	Total	Male	Female	GEN	OBC	SC	ST	EWS	PwD	Foreign Students
Full Time	1094	737	357	616	280	156	42	2	10	7
Full Time Project Fellows	98	70	28	63	29	6	0	0	1	0
Part Time	1194	1005	189	1020	124	37	13	0	7	0
Total	2386	1812	574	1699	433	199	55	2	18	7

Department wise distribution of Ph.D. Scholars				
Department	Full Time	Part Time	Full Time Project Fellows	Total
Applied Geology	69	109	10	188
Applied Geophysics	52	87	4	143
Chemical Engineering	22	15	3	40
Chemistry	88	29	14	131
Civil Engineering	33	14	2	49
Computer Science and Engineering	74	77	2	153
Electrical Engineering	54	125	2	181
Electronics Engineering	90	111	5	206
Environmental Science and Engineering	76	76	2	154
Fuel, Minerals and Metallurgical Engineering	42	36	1	79
Humanities and Social Sciences	42	35	3	80
Management Studies	43	89	1	133
Mathematics and Computing	93	39	24	156
Mechanical Engineering	109	141	6	256
Mining Engineering	48	132	6	186
Mining Machinery Engineering	28	48	0	76
Petroleum Engineering	35	16	6	57
Physics	96	15	7	118
Total	1094	1194	98	2386

2.3 Convocation

The 40th Convocation of the Institute was held on 21st December, 2019. Shri Shashi Shanker, Chairman, ONGC delivered his Convocation Address to the graduating students of 2018-19 batch. A total number of 1,988 students were conferred on to their degree.



Details of Degrees Awarded during 40 th Convocation	
Name of Degree	No. of Degrees Awarded
Doctor of Philosophy	107
4 Year - Bachelor of Technology	777
5 Year - Dual Degree	45
5 Year - Integrated Master of Science and Technology	1
5 Year - Integrated Master of Technology	61
2 Year - Master of Science	128
3 Year - Master of Science and Technology	103
2 Year - Master of Business Administration	36
3 Year - Master of Business Administration	13
2 Year - Master of Technology	669
3 Year - Master of Technology	48
Total	1988

Performance Highlights

Details of Medals and Awards during 40th Convocation

Presidents Gold Medal (01 Student)

Institute Gold Medals (58 Students)

- M. Tech Programme: 27 Students
- M. Tech (3 Years) Programme: 05 Students
- MBA Programme: 02 Students
- 5 Year Dual Degree Programme: 03 Students
- 5 Year Integrated Programme: 03 Students
- M. Sc. Tech Programme: 02 Students
- M. Sc. Programme: 03 Students
- B. Tech Programme: 13 Students

Institute Silver Medal (17 Students)

- M. Tech Programme: 06 Students
- M. Sc. Tech Programme: 02 Students
- M. Sc. Programme: 03 Students
- B. Tech Programme: 06 Students

Sponsored Medals/Prizes conferred to the students in the convocation:

- Prof. S. Srinivasan Gold Medal
- Kaushalya Devi Gold Medal
- L. J. Johnson Gold Medal
- Smt. Sneha Lata Srivastava Memorial Gold Medal
- Late Mrs. Poonam (Khanna) Singh Memorial Cash Award
- Late Mitali Sen Memorial Award
- Prof. S. P. Banerjee Gold Medal
- ISMAA Best UG Student (admitted through IIT-JEE) Award
- ISMAA Best Sports Person Award
- Prof. N. L. Sharma Gold Medal
- Late Jagdish Mitter Dhawan Memorial Gold Medal
- Smt. Nirja Sahay Memorial Gold Medal
- Smt. Renuka Rajhans Memorial Gold Medal
- Mata Gurdev Kaur Memorial Award
- Late Mrs. Chitra Bhattacharya Memorial Gold Medal
- State Bank of India Award for IIT (ISM) Student
- ISMAA Best PG Student Award

2.4 Ph.D. Degree Awarded

A list of Ph.D. degrees awarded during 2019-20 is given below:

S. No.	Name, Admission No. & Date of Award	Title of the Thesis; Guide(s); Department
1	Ashish Kumar Sinha 2013/DR/0163 01.04.2019	WAVELET TRANSFORM AND ANN BASED FAULT DIAGNOSIS SCHEME FOR SIMULTANEOUS DETECTION OF BROKEN ROTOR BARS AND BEARING DAMAGES IN SQUIRREL CAGE INDUCTION MOTOR Prof. T. K. Chatterjee (Guide); Dr. Sukanta Das (Co-Guide); Mining Machinery Engineering

S. No.	Name, Admission No. & Date of Award	Title of the Thesis; Guide(s); Department
2	Nikhil Kumar 2014/DR/1022 01.04.2019	STABILITY ANALYSIS OF ROAD CUT SLOPES IN HIMALAYAN REGIONS OF INDIA Dr. Amit Kumar Verma (Guide); Mining Engineering
3	Vivek Kumar Verma 2014/DR/0015 01.04.2019	CONSUMER PREFERENCE TOWARDS SUSTAINABLE PRACTICES IN HOTEL INDUSTRY IN INDIA - A STUDY Dr. Bibhas Chandra (Guide); Management Studies
4	Sujit Kumar 2013/DR/0244 01.04.2019	PERFORMANCE INVESTIGATION OF HYDRO-MOTOR DRIVE SYSTEM USING PROPORTIONAL AND PRIORITY VALVES Prof. K. Dasgupta (Guide), Dr. Jayanta Das (Co-Guide); Mining Machinery Engineering
5	Anupam Kumar 2014/DR/0271 01.04.2019	STRUCTURES AND PHASE TRANSITION IN MODEL SOFT MATTER SYSTEMS: THEORY AND SIMULATION Dr. Pankaj Mishra (Guide); Applied Physics
6	Manojkumar Gudala 2015/DR/1050 01.04.2019	STUDIES ON HYDRODYNAMICS OF HEAVY OIL-WATER FLOWS THROUGH PIPELINES USING BIO-ADDITIVES: EXPERIMENTAL AND SIMULATIONS Dr. Tarun Kumar Naiya (Guide), Dr. Ajay Mandal (Co-Guide), Prof. T. Ramamohan Rao (External Guide), VCE, Hyderabad; Petroleum Engineering
7	Rabesh Kumar Singh 2014/DR/0203 01.04.2019	INVESTIGATION ON THE EFFECT OF NANO-PARTICLE MIXED CUTTING FLUID ON METAL CUTTING PROCESS Dr. A. R. Dixit (Guide); Mechanical Engineering
8	Komal Rani 16/DP/000022 01.04.2019	INTEGRATED USE OF EMISSIVITY, THERMAL INERTIA AND GEOPHYSICAL DATA FOR GEOLOGICAL MAPPING IN PARTS OF BANSWARA, RAJASTHAN, INDIA Dr. Sanjit Kumar Pal (Guide), Dr. Arindam Guha (External Guide), NRSC (ISRO), Hyderabad; Applied Geophysics
9	Manu Mehta 2015/DR/1141 04.05.2019	A GLOBAL STUDY ON SPATIO-TEMPORAL VARIABILITY OF AEROSOLS INFERRED FROM SPACE BORNE MEASUREMENTS Dr. Anshumali (Guide), Dr. Narendra Singh (External Guide), ARIES, Nainital; Environmental Science and Engineering
10	Subha Ranjan Paul 2012/DR/0158 04.05.2019	PERFORMANCE EVALUATION OF COARSE COAL CLEANING JIGS IN OPERATING PLANTS Prof. S. Bhattacharya (Guide); Fuel and Mineral Engineering
11	Sunita Sinha 2014/DR/0033 04.05.2019	DESIGN OF FLOW AND PRESSURE TRANSDUCERS AND THEIR PERFORMANCE OPTIMIZATION USING ANN FOR INDUSTRIAL APPLICATION Dr. Nirupama Mandal (Guide); Electronics Engineering
12	Pawan Kumar Singh 2014/DR/1115 04.05.2019	TO INVESTIGATE THE CORPORATE SOCIAL RESPONSIBILITY (CSR) PRACTICE OF INDIAN COAL MINING INDUSTRY AND SCALING ITS INFLUENCE ON SUSTAINABLE DEVELOPMENT Prof. A. K. Mishra (Guide), Prof. Pramod Pathak (Co-Guide), Dr. Hardeo Prasad (External Guide), BCCL Dhanbad; Mining Engineering
13	Alok Kumar Shrivastav 2015/DR/1046 04.05.2019	POWER QUALITY ESTIMATION AND DISTURBANCE MITIGATION OF POWER SYSTEMS Prof. P. K. Sadhu (Guide), Prof. Ankur Ganguly (External Guide), Techno India Batanagar, Kolkata; Electrical Engineering
14	Pasupati Paul 2015/DR/1087 04.05.2019	PROPAGATION OF ELASTIC WAVES IN LAYERED MEDIA Dr. Santimoy Kundu (Guide), Dr. Dinbandhu Mandal, Govt. Engineering College, Chaibasa (External Guide); Applied Mathematics

Performance Highlights

S. No.	Name, Admission No. & Date of Award	Title of the Thesis; Guide(s); Department
15	Sayed Mohammed Zeeshan 2013/DR/0177 18.06.2019	SOME EFFICIENT ESTIMATION PROCEDURES FOR POPULATION MEAN IN SAMPLE SURVEYS Dr. G. K. Vishwakarma (Guide); Applied Mathematics
16	Swapan Suman 2014/DR/0056 18.06.2019	STUDIES ON COMBUSTION AND CARBONIZATION CHARACTERISTICS OF AGRICULTURAL WASTES FOR THERMAL AND METALLURGICAL PURPOSES Dr. Shalini Gautam (Guide); Fuel and Mineral Engineering
17	Naveen Mishra 2014/DR/0050 18.06.2019	INVESTIGATIONS ON DIFFERENT MICROWAVE METAMATERIAL STRUCTURES AND THEIR APPLICATIONS Dr. Raghendra Kumar Chaudhary (Guide); Electronics Engineering
18	Rakesh Kumar Mishra 2013/DR/1002 18.06.2019	DETECTION, ANALYSIS OF FIRE AND ITS EFFECT ON ENVIRONMENT IN MINING AREA USING REMOTE SENSING AND GEOPHYSICAL TECHNIQUES Prof. P. N. Singha Roy (Guide), Dr. J. K. Pandey & Dr. V. K. Singh (External Guides), CSIR-CIMFR, Dhanbad; Applied Geophysics
19	Auchitya Kumar Pandey 2014/DR/0057 18.06.2019	ASSESSMENT OF SEISMIC HAZARD FOR THE NORTHEAST INDIA Prof. P. N. Singha Roy (Guide); Applied Geophysics
20	Satya Narayan 2014/DR/0184 18.06.2019	NEW INSIGHTS INTO THE STRUCTURAL AND TECTONIC SETTINGS OF BAY OF BENGAL OFFSHORE REGION USING COMBINED GLOBAL GRAVITY MODEL DATA Dr. Sanjit Kumar Pal (Guide); Applied Geophysics
21	Rupesh Rajak 2013/DR/0247 18.06.2019	DEVELOPING A FRAMEWORK OF EMPLOYEES' BURNOUT AND WORK ENGAGEMENT - A STUDY OF HIGHER EDUCATIONAL INSTITUTIONS IN INDIA Dr. Bibhas Chandra (Guide); Management Studies
22	Tanuj Kumar 2015/DR/0314 18.06.2019	AN INVESTIGATION AND DEVELOPMENT OF A PAIR OF LINEAR CANONICAL HANKEL TRANSFORMS AND SOME ALLIED INTEGRAL OPERATORS Dr. Akhilesh Prasad (Guide); Applied Mathematics
23	Hema Srivastava 2013/DR/0109 18.06.2019	DEPOSITIONAL ENVIRONMENT, BIOSTRATIGRAPHY AND HYDROCARBON GENERATION POTENTIALITY OF MESOZOIC AND CENOZOIC SEDIMENTS OF THE KACHCHH BASIN: FORAMINIFERAL, NANNOPLANKTON AND GEOCHEMICAL STUDIES Dr. Ajoy Kumar Bhaumik (Guide); Prof. S. Mohanty, (Co-Guide); Applied Geology
24	Anand Govind More 2014/DR/0253 18.06.2019	INVESTIGATING FEASIBILITY OF BIO-ELECTROCHEMICAL REACTOR FOR REMOVAL OF HEXAVALENT CHROMIUM FROM ELECTROPLATING EFFLUENTS Prof. S. K. Gupta (Guide); Environmental Science and Engineering
25	Sumit Kumar 2014/DR/1003 18.06.2019	DEVELOPMENT OF HYBRID ORGANIC-INORGANIC NANOMATERIALS FOR APPLICATION IN OPTOELECTRONICS AND BIOSENSORS Dr. Jitendra Kumar (Guide), Dr. Shailesh N. Sharma (External Guide), CSIR-NPL, New Delhi; Electronics Engineering
26	Ranjan Kumar Ray 2012/DR/1097 13.08.2019	HYDROGEOLOGICAL FRAMEWORK AND GROUNDWATER RESOURCES ASSESSMENT OF SEONATH-KHARUN INTERFLUVE AREA IN CHHATTISGARH STATE Dr. T. H. Syed (Guide), Prof. B. C. Sarkar (Co-Guide) Dr. Dipankar Saha (External Guide), Member (Retd.), CGWB, Faridabad; Applied Geology

S. No.	Name, Admission No. & Date of Award	Title of the Thesis; Guide(s); Department
27	Smita 2014/DR/0005 13.08.2019	MATHEMATICAL ANALYSIS OF PLANE AND SURFACE WAVES IN ANISOTROPIC STRATIFIED MEDIA Prof. S. Gupta (Guide); Mathematics & Computing
28	Chandrani Sarkar 2014/DR/1135 13.08.2019	SYNTHESIS OF CELLULOSE-HYDROXYAPATITE BASED TERNARY COMPOSITES FOR POSSIBLE ORTHOPEDIC APPLICATIONS Dr. Sumanta Kumar Sahu (Guide); Chemistry
29	Kumari Bimla Mardi 2013/DR/0226 13.08.2019	MECHANICAL AND MACHINING CHARACTERIZATION OF Mg-BASED NANOCOMPOSITES Dr. A. R. Dixit (Guide), Dr. Ashis Mallick (Co-Guide); Mechanical Engineering
30	Choudhary Shyam Prakash 2014/DR/0055 13.08.2019	TECHNIQUES ON TRANSFORM DOMAIN DIGITAL IMAGE FORENSICS Dr. Hari Om (Guide), Dr. Sushila Maheshkar (External Guide), NIT, Delhi; Computer Science and Engineering
31	Puja Rajhans 2014/DR/0145 13.08.2019	SUSTAINABLE DEVELOPMENT OF SCC FROM C&D WASTE BY ADOPTING EMV MIX DESIGN METHOD ALONG WITH TWO STAGE MIXING APPROACH Dr. Sarat Kumar Panda (Guide), Dr. Sanket Nayak (Co-Guide); Civil Engineering
32	Lalathendu Muduli 2015/DR/0077 13.08.2019	DESIGN OF WIRELESS SENSOR NETWORK BASED MONITORING SYSTEM FOR UNDERGROUND COAL MINES Prof. P. K. Jana (Guide), Dr. D. P. Mishra (Co-Guide); Computer Science and Engineering
33	Rishikesh Dutta Tiwary 2013/DR/0285 13.08.2019	ORBITS AROUND LIBRATION POINTS IN THE SUN-EARTH SYSTEM Dr. B. S. Kushvah (Guide); Mathematics & Computing
34	Reena Kumari 2013/DR/0187 13.08.2019	INVESTIGATION ON CIRCULARLY POLARIZED DIELECTRIC RESONATOR ANTENNAS FOR WIDEBAND AND MULTIBAND APPLICATIONS Dr. R. K. Gangwar (Guide); Electronics Engineering
35	Prasenjit Das 2014/DR/0117 13.08.2019	RESISTIVITY AND SEISMIC IMAGING FOR DETECTION OF SUBSURFACE CAVITIES ASSOCIATED WITH OLD COAL WORKING Prof. P. R. Mohanty (Guide); Applied Geophysics
36	S. Kannan 2014/DR/1024 13.08.2019	A STUDY ON TUBE TO TUBE PLATE USING FRICTION WELDING AND TIG WELDING PROCESS Dr. L. A. Kumaraswamidhas (Guide), Dr. S. Senthilkumaran (External Guide), RVS School of Engineering & Technology, Dindigul; Mining Machinery Engineering
37	Akhil Avchar 2016/DR/1054 18.09.2019	AN INVESTIGATION INTO THE INFLUENCE OF LATERITE ROCK PROPERTIES ON THE PERFORMANCE OF RIPPERS WITH RESPECT TO GEO-MINING CONDITIONS OF GOA Dr. B. S. Choudhary (Guide), Dr. G. Budi (Co-Guide); Mining Engineering
38	Vallisree S 2015/DR/1100 18.09.2019	DESIGN AND ANALYSIS OF SILICON-CZTS TANDEM SOLAR CELLS FOR EFFICIENCY ENHANCEMENT Dr. R. Thangavel (Guide), Dr. T. R. Lenka (External Guide), NIT, Silchar; Physics
39	Shivesh Kishore Karan 2014/DR/0190 18.09.2019	DEVELOPMENT OF A SPATIALLY EXPLICIT FRAMEWORK FOR VULNERABILITY ASSESSMENT OF WATER RESOURCES DUE TO COAL MINING IN INDIA Dr. S. R. Samadder (Guide); Environmental Science and Engineering

Performance Highlights

S. No.	Name, Admission No. & Date of Award	Title of the Thesis; Guide(s); Department
40	Divya Pal 2015/DR/0036 18.09.2019	HEAVY METAL POLLUTION, ASSOCIATED RISK CHARACTERIZATION IN DIFFERENT COMPONENTS (SEDIMENT, WATER, AND FISH) OF LENTIC AND LOTIC HABITAT AND ITS REMEDIATION IN LENTIC HABITAT Prof. S. K. Maiti (Guide); Environmental Science and Engineering
41	Indrajeet Gupta 2014/DR/0060 18.09.2019	DESIGN OF EFFICIENT ALGORITHMS FOR TASK SCHEDULING IN CLOUD COMPUTING Prof. P. K. Jana (Guide); Computer Science and Engineering
42	Amit Kumar 2015/DR/0074 18.09.2019	DESIGNING OF SECURE SEAMLESS HANDOVER AUTHENTICATION TECHNIQUES FOR WIRELESS NETWORKS Dr. Hari Om (Guide); Computer Science and Engineering
43	Abhinav Gautam 2014/DR/0195 18.09.2019	ANALYTICAL AND EXPERIMENTAL DAMAGE GROWTH STUDIES ON AISI 1020, AISI 1030 STEELS AND AL 2024 ALLOY DURING LARGE DEFORMATION AND LOW CYCLE FATIGUE Prof. P. K. Sarkar (Guide); Mechanical Engineering
44	Ashok Kumar 2014/DR/0035 18.09.2019	DESIGN OF ANALOG FILTERS: A CURRENT MODE BUILDING BLOCK APPROACH Prof. S. K. Paul (Guide); Electronics Engineering
45	Prashanta Kumar Mandal 2014/DR/0192 18.09.2019	ANALYTICAL AND NUMERICAL STUDY OF HYDROMAGNETIC FLOW THROUGH POROUS AND NON-POROUS MEDIA Prof. G. S. Seth (Guide); Mathematics & Computing
46	Ritu Raj Singh 2015/DR/0275 18.09.2019	DESIGN AND MODELING OF SILICON NANOWIRE OPTICAL WAVEGUIDE SENSORS Prof. Vishnu Priye (Guide); Electronics Engineering
47	Alka Damodhar Kamble 2014/DR/1129 03.10.2019	STUDIES ON FUEL BLENDING EFFECTS ON THE CO-GASIFICATION OF HIGH ASH COAL AND BIOMASS Prof. V. K. Saxena (Guide), Dr. Prakash Dhondiram Chavan (External Guide), CSIR-CIMFR, Dhanbad; Chemical Engineering
48	Mamta Besra 2014/DR/0058 03.10.2019	STUDYING THE ANTIBACTERIAL ACTIVITIES OF HERBAL PLANTS EXTRACT WITH SPECIAL EMPHASIS ON DENTAL CARIES Dr. Vipin Kumar (Guide); Environmental Science and Engineering
49	Utpal Goswami 2015/DR/1054 03.10.2019	PERFORMANCE IMPROVEMENT OF SUPER CRITICAL CAPTIVE POWER PLANT UNDER ISLANDING MODE Prof. Pradip Kumar Sadhu (Guide); Electrical Engineering
50	Ashwani Kumar 2014/DR/0149 03.10.2019	HEALTH MONITORING OF HEAVY EARTH MOVING MACHINERY THROUGH USED OIL ANALYSIS Dr. Subrata Kumar Ghosh (Guide); Mechanical Engineering
51	Hemant Agrawal 2014/DR/1114 03.10.2019	ASSESSMENT AND PREDICTION OF BLAST INDUCED GROUND VIBRATION WITH VARIATION IN DELAY TIME ACCURACY OF DETONATORS BY DEVELOPING INNOVATIVE APPROACH - MODIFIED SCALE DISTANCE ANALYSIS, SEISMIC ENERGY AND SIMPLIFIED SIGNATURE HOLE ANALYSIS Prof. A. K. Mishra (Guide); Mining Engineering
52	Pranab Kanti Roy 2013/DR/1079 03.10.2019	HEAT TRANSFER ANALYSIS OF LONGITUDINAL FINS WITH MULTIPLE NON-LINEARITIES Dr. Ashis Mallick (Guide); Mechanical Engineering
53	Priyanka Singh 2015/DR/1101 03.10.2019	AN INTEROPERABILITY MODEL FOR BIO-RESOURCE DISTRIBUTED DATABASE USING DATA SCIENCE Prof. Dheeraj Kumar (Guide), Dr. Sameer Saran (External Guide), IIRS, Dehradun; Mining Engineering
54	Sankar Mukherjee 2012/DR/1020 15.11.2019	MAC AND ROUTING PROTOCOLS FOR MANET AND WIRELESS SENSOR NETWORKS Prof. G. P. Biswas (Guide); Computer Science and Engineering

S. No.	Name, Admission No. & Date of Award	Title of the Thesis; Guide(s); Department
55	Dipesh Kumar 2014/DR/0205 15.11.2019	ACTIVE POWER CONTROL STRATEGIES FOR WIND ENERGY SYSTEM Dr. Kalyan Chatterjee (Guide); Electrical Engineering
56	Suvam Singh 2015/DR/0279 15.11.2019	ELECTRON AND POSITRON SCATTERING DYNAMICS IN ATOMS AND MOLECULES Prof. Bobby Antony (Guide); Physics
57	Gokul Kumar Saha 2013/DR/1076 15.11.2019	SEISMIC IMAGING OF CRUST AND UPPERMOST MANTLE BENEATH SOUTH ASIA, TIBET AND NORTH INDIAN OCEAN Prof. Shalivahan (Guide), Prof. S. S. Rai (External Guide), IISER, Pune; Applied Geophysics
58	Akhilesh Kumar Pathak 2015/DR/0059 15.11.2019	TO DESIGN AND CHARACTERIZE DIFFERENT TYPES OF FIBER SENSORS Dr. V. K. Singh (Guide); Physics
59	Ashish Kumar 2016/DR/1014 15.11.2019	ATMOSPHERIC STUDIES USING REMOTE SENSING TECHNIQUES AND IN-SITU MEASUREMENTS OVER THE HIMALAYAN REGION Dr. Anshumali (Guide), Dr. Narendra Singh (External Guide), ARIES, Nanital; Environmental Science and Engineering
60	Bibhuti Mary Kachhap 2014/DR/0272 15.11.2019	FROM MUMMERY OF POLITICS TO MOULDERING LIFE: A STUDY OF SELECT SRI LANKAN NOVELS Dr. Aju Aravind (Guide); Humanities and Social Sciences
61	Priyanka Jaiswal 2014/DR/0114 15.11.2019	DESIGN OF SOME ECC BASED GROUP KEY ESTABLISHMENT PROTOCOLS Dr. Sachin Tripathi (Guide); Computer Science and Engineering
62	Sumangal Dasgupta 2015/DR/1057 15.11.2019	ORIGIN OF OVERPRESSURE AND PREDICTION OF PORE PRESSURE IN EXTENSIONAL AND COMPRESSIONAL BASINS OF INDIA: ANALYSIS FROM THE KRISHNA-GODAVARI, CAUVERY AND ASSAM BASINS Prof. S. Mohanty (Guide), Prof. Rima Chatterjee, (Co-Guide); Applied Geology
63	P. Balamadeswaran 2015/DR/1022 15.11.2019	INVESTIGATIONS INTO THE BLAST DESIGN PARAMETERS INFLUENCING FRAGMENTATION AND BLAST-INDUCED GROUND VIBRATIONS IN OPENCAST MINES Prof. A. K. Mishra (Guide), Prof. Phalguni Sen (Co-Guide); Mining Engineering
64	Kamlesh Kumar Pankaj 2015/DR/0106 15.11.2019	DYNAMICS OF POLARISED SEISMIC WAVES (LOVE-TYPE WAVES AND TORSIONAL WAVES) IN PRE-STRESSED STRATIFIED MEDIA WITH DISTINCT INTERFACIAL CONDITIONS Dr. Sanjeev A. Sahu (Guide); Mathematics & Computing
65	Joby Antony 2015/DR/1004 15.11.2019	DESIGN AND DEVELOPMENT OF INTELLIGENT DATA ACQUISITION SYSTEM FOR A CRYOGENIC APPLICATION USING INDIGENOUSLY DEVELOPED INSTRUMENTS Dr. Tanmoy Maity (Guide); Mining Machinery Engineering
66	Lipi Midya 2015/DR/0249 15.11.2019	POLYMERIC NANOCOMPOSITES DERIVED FROM FUNCTIONALIZED CHITOSAN: DEVELOPMENT AND APPLICATION Dr. Sagar Pal (Guide); Chemistry
67	Juli Kumari 2014/DR/0019 09.12.2019	EVALUATION OF SEDIMENT YIELD CHARACTERISTICS AND FIXED NUTRIENT IN MIDDLE STRETCH OF DAMODAR RIVER, EASTERN INDIA Dr. Biswajit Paul (Guide); Environmental Science and Engineering
68	Chiranjit Ghosh 2015/DR/0310 09.12.2019	DESIGN AND PERFORMANCE ANALYSIS OF FBG BASED SYSTEMS FOR APPLICATIONS IN OPTICAL COMMUNICATION AND SENSORS Prof. Vishnu Priye (Guide); Electronics Engineering

Performance Highlights

S. No.	Name, Admission No. & Date of Award	Title of the Thesis; Guide(s); Department
69	Nishit Malviya 2014/DR/0031 09.12.2019	NONLINEAR SLOT WAVEGUIDE FOR SILICON PHOTONIC DEVICES Prof. Vishnu Priye (Guide); Electronics Engineering
70	Shireen Quereshi 2014/DR/0132 09.12.2019	PRODUCTION OF FUELS AND VALUE ADDED CHEMICALS FROM RENEWABLE BIOMASS SOURCES Dr. Suman Dutta (Guide), Dr. T. K. Naiya, Petroleum Engineering (Co-Guide); Chemical Engineering
71	Santosh Ghosh 2014/DR/1071 09.12.2019	MITIGATION OF ENVIRONMENTAL IMPACT ON PHOTOVOLTAIC PERFORMANCE Dr. V. Mukherjee (Guide), Dr. V. K. Yadav (External Guide), DTU, Delhi; Electrical Engineering
72	Ashmi Chakraborty Das 2013/DR/1016 09.12.2019	ANALYSIS OF T-JUNCTIONS, COUPLERS, MULTIPLEXERS AND ORTHOMODE TRANSDUCERS USING CAVITY MODEL Dr. Santanu Dwari (Guide); Electronics Engineering
73	Satabdi Misra 2014/DR/0041 09.12.2019	PETROGRAPHICAL AND ORGANO-GEOCHEMICAL STUDIES OF COAL AND SHALE OF RANIGANJ & BARJORA BASINS, WEST BENGAL, INDIA Prof. Atul Kumar Varma (Guide), Dr. Supriyo Kumar Das (External Guide), Presidency University, Kolkata; Applied Geology
74	Pranab Kumar Das 2015/DR/0017 09.12.2019	ASSESSING SEISMIC SUSCEPTIBILITY THROUGH DAMAGE SURVEY AND RVS WITH A SPECIAL FOCUS ON BEHAVIOUR OF IRREGULAR BUILDINGS Prof. S. C. Dutta (Guide); Civil Engineering
75	Md. Safiullah 2014/DR/0089 09.12.2019	EFFICACY OF POLITICAL ADVERTISING - A STUDY OF INDIAN ELECTIONS Prof. Pramod Pathak (Guide), Dr. Saumya Singh (Co-Guide); Management Studies
76	Sumit Kumar 2014/DR/0235 09.12.2019	SIGNIFICATORS OF CONSUMER CHOICE BEHAVIOUR TOWARDS PRIVATE LABEL BRANDS: A STUDY IN INDIAN e-MARKET Dr. Bibhas Chandra (Guide); Management Studies
77	Pawan Kumar 2013/DR/0189 09.12.2019	DESIGN AND DEVELOPMENT OF ADVANCED MULTIBAND PRINTED ANTENNAS Dr. Santanu Dwari (Guide); Electronics Engineering
78	Anand Gaurav 2015/DR/0038 09.12.2019	AN EXPERIMENTAL AND STATISTICAL ANALYSIS ON FATIGUE BEHAVIOUR OF MWCNT BASED GFRP NANOCOMPOSITES Dr. K. K. Singh (Guide); Mechanical Engineering
79	Thota Sivasankar 2015/DR/1159 09.12.2019	VEGETATION BIOPHYSICAL PARAMETERS RETRIEVAL USING RISAT - 1 HYBRID POLARIMETRIC SAR DATA Prof. Dheeraj Kumar (Guide), Dr. H. S. Srivastava (External Guide), IIRS, ISRO, Dehradun; Mining Engineering
80	Sunil Kumar Chaudhary 2013/DR/1045 09.12.2019	DEVELOPMENT AND MECHANICAL CHARACTERIZATION OF MULTIWALL CARBON NANOTUBES DOPED GLASS FIBER REINFORCED POLYMER COMPOSITES Dr. K. K. Singh (Guide), Prof. R. Venugopal, (Co-Guide); Mechanical Engineering
81	Shubhashri Kumari 2013/DR/0268 09.12.2019	DYNAMIC SPECKLE IMAGING AND THEIR APPLICATIONS Prof. A. K. Nirala (Guide); Applied Physics
82	Sneha Shah 2015/DR/0088 19.12.2019	DEVELOPMENT OF SOLID ACID CATALYST FOR DEHYDRATION AND C-H ACTIVATION REACTION Prof. Biswajit Chowdhury (Guide); Chemistry

S. No.	Name, Admission No. & Date of Award	Title of the Thesis; Guide(s); Department
83	Balakrushna Panda 2015/DR/1033 19.12.2019	STUDY ON MORPHOMETRY AND WATER CHEMISTRY OF THE KEN RIVER SYSTEM, CENTRAL INDIA Dr. Anshumali (Guide); Environmental Science and Engineering
84	Archana Kumari 2016/DR/1049 19.12.2019	STUDIES FOR THE RECOVERY OF LANTHANIDE GROUP METALS FROM PRIMARY AND SECONDARY RESOURCES Prof. D. D. Pathak (Guide), Dr. Manis Kumar Jha (External Guide), CSIR-NML, Jamshedpur; Chemistry
85	Uday Sankar Chattopadhyay 2012/DR/1090 19.12.2019	LABORATORY AND PILOT PLANT FLOTATION STUDIES ON RECOVERY OF COAL VALUES FROM A SETTLING POND SLURRY AND ITS COKING PROPENSITY Prof. R. Venugopal (Guide), Dr. T. Gouricharan (External Guide), CSIR-CIMFR, Dhanbad; Fuel, Minerals and Metallurgical Engineering
86	Alok Vardhan 2015/DR/0242 19.12.2019	PERFORMANCE INVESTIGATION OF HYDRAULIC DRIVE SYSTEMS USED IN THE ROTARY HEAD OF THE BLASTHOLE DRILL MACHINE Prof. K. Dasgupta (Guide); Mining Machinery Engineering
87	Bhubon Chandra Mech 2014/DR/0046 20.01.2020	ANALOG AND RF PERFORMANCE OF NANOSCALE FETs WITH EMERGING CHANNEL MATERIALS Dr. Jitendra Kumar (Guide); Electronics Engineering
88	Rabi Narayan Senapati 2011/DR/0121 20.01.2020	HETEROPOLY ACID BASED CATALYSTS FOR AMMOXIDATION AND DEHYDROCYCLIZATION REACTIONS Prof. D. D. Pathak (Guide), Dr. Pashupati Dutta (External Guide), CSIR-CIMFR, Dhanbad; Chemistry
89	Samaresh Layek 2014/DR/0169 20.01.2020	SYNTHESIS AND CHARACTERIZATION OF TRANSITION METAL SCHIFF BASE COMPLEXES OF Cu(II), Ni(II) & Pd(II): APPLICATIONS IN SELECTED ORGANIC REACTIONS Prof. D. D. Pathak (Guide); Chemistry
90	Surbhi Suman 2014/DR/0162 20.01.2020	ESTIMATION PROCEDURES OF PARAMETERS OF SENSITIVE AND NON-SENSITIVE CHARACTERISTICS UNDER NON-RESPONSE IN SAMPLE SURVEYS Prof. G. N. Singh (Guide); Mathematics & Computing
91	Bijendra Kumar 2014/DR/0286 20.01.2020	PHOSPHORUS FRACTIONATION IN SURFACE SEDIMENTS: AN IMPLICATION IN RESTORATION AND CONSERVATION OF GOVIND BALLABH PANT SAGAR, SINGRAULI, M. P. Dr. Anshumali (Guide); Environmental Science and Engineering
92	Richa Vinayak 2014/DR/0139 20.01.2020	ORGANOTIN(IV) COMPLEXES FOR BIOLOGICAL STUDIES AND SENSING OF TRANSITION METAL IONS Dr. Hari Pada Nayek (Guide); Chemistry
93	Rahul Kumar 2015/DR/0232 04.02.2020	COMPUTATIONAL ANALYSIS OF RAYLEIGH STEP BEARING OPERATING UNDER ELASTOHYDRODYNAMIC LUBRICATION Dr. S. K. Ghosh (Guide); Mechanical Engineering
94	Ravi Shankar Prasad 2011/DR/0136 04.02.2020	NUMERICAL INVESTIGATION OF NATURAL CONVECTION AND SURFACE RADIATION IN CAVITIES Dr. S. N. Singh (Guide); Mechanical Engineering
95	Vishal Saxena 2015/DR/1133 04.02.2020	EXPERIMENTAL INVESTIGATIONS ON THE FEASIBILITY OF EMULSIFIED BIODIESEL WITH NANOPARTICLES ADDITIVES (MODIFIED FUEL) IN A MODIFIED COMPRESSION IGNITION ENGINE Prof. V. K. Saxena (Guide); Fuel, Minerals and Metallurgical Engineering

Performance Highlights

S. No.	Name, Admission No. & Date of Award	Title of the Thesis; Guide(s); Department
96	Nitish Kumar Gautam 2013/DR/0235 04.02.2020	MODELING OF WATER DISTRIBUTION PIPE NETWORK FOR INDIAN SEMI-URBAN AREA Dr. Shibayan Sarkar (Guide); Mechanical Engineering
97	Rakesh Ranjan Kumar 2014/DR/0181 04.02.2020	QoS AWARE CLOUD SERVICE SELECTION FRAMEWORK USING MCDM TECHNIQUES Prof. Chiranjeev Kumar (Guide); Computer Science and Engineering
98	Govind Murmu 2010/DR/0040 04.02.2020	TRANSFORM-DOMAIN ADAPTIVE FILTERS - PERFORMANCE STUDY THROUGH SIMULATION AND REAL-TIME IMPLEMENTATION Prof. Subrata Bhattacharya (Guide); Electronics Engineering
99	Mohd Khalid 2015/DR/0025 04.02.2020	SOME EFFICIENT ESTIMATION PROCEDURES IN PRESENCE AND ABSENCE OF COMPLETE RESPONSE IN SAMPLE SURVEYS Prof. G. N. Singh (Guide); Mathematics & Computing
100	Pradeepika Verma 2014/DR/0147 04.02.2020	DOCUMENT SUMMARIZATION TECHNIQUES USING META-HEURISTIC APPROACHES Dr. Hari Om (Guide); Computer Science and Engineering
101	Akanksha Mishra 2014/DR/1030 04.02.2020	GASIFICATION KINETIC STUDIES ON LOW VOLATILE WEAKLY CAKING COAL AND JHAMA COAL FOR SYNGAS PRODUCTION AND ITS UTILISATION FOR REDUCTION OF IRON ORE PELLETS Dr. Shalini Gautam (Guide); Fuel, Minerals and Metallurgical Engineering
102	Manoj Kumar Senapati 2015/DR/1195 04.02.2020	NEW CONTROL STRATEGIES FOR POWER MANAGEMENT IN GRID CONNECTED AND STANDALONE RENEWABLE SYSTEMS Dr. Paresh Kumar Nayak (Guide); Electrical Engineering
103	Neelima Bhengra 2014/DR/0143 04.02.2020	DISPERSIVE ATTRIBUTES OF TORSIONAL, SH AND LOVE-TYPE WAVE INFLUENCED BY ANISOTROPY, INHOMOGENEITY AND MAGNETOELASTICITY Prof. S. Gupta (Guide); Mathematics & Computing
104	Hasanuzzaman 2014/DR/0221 04.02.2020	SUSTAINABILITY ISSUES IN SURFACE COAL MINING OF INDIA vis-à-vis IMPROVEMENT STUDIES Prof. Chandan Bhar (Guide); Management Studies
105	Rupa Rani 2014/DR/0138 04.02.2020	BIODEGRADATION OF ENDOSULFAN BY PLANT GROWTH PROMOTING RHIZOBACTERIA Dr. Vipin Kumar (Guide); Environmental Science and Engineering
106	Abhinav Singhal 2015/DR/0047 04.02.2020	ANALYSIS OF SEISMIC WAVE TRANSFERENCE IN LAYERED ELASTIC STRUCTURES INCLUDING PIEZO-COMPOSITES WITH DISTINCT INTERFACIAL CONDITIONS Dr. Sanjeev A. Sahu (Guide); Mathematics & Computing
107	Ashes Banerjee 2014/DR/0124 04.02.2020	APPLICABILITY AND BEHAVIOR OF THE FORCHHEIMER AND WILKINS EQUATIONS FOR THE VELOCITY AND HYDRAULIC GRADIENT CHARACTERISTICS IN POST-LAMINAR FLOW THROUGH POROUS MEDIA SUBJECTED TO PARALLEL AND CONVERGENT BOUNDARIES Dr. Srinivas Pasupuleti (Guide); Civil Engineering
108	Sourav Kumar Mondal 2013/DR/0077 04.02.2020	TREATMENT OF SYNTHETIC PHARMACEUTICAL WASTEWATER CONTAINING CIPROFLOXACIN AND GABAPENTIN DRUGS BY MODIFIED ADVANCED OXIDATION PROCESSES (AOPs) Dr. Alok Sinha (Guide); Environmental Science and Engineering

S. No.	Name, Admission No. & Date of Award	Title of the Thesis; Guide(s); Department
109	Kunal Modak 2012/DR/0118 27.02.2020	STRUCTURAL GEOMETRY, KINEMATICS OF DEFORMATION, LOW GRADE METAMORPHISM AND PALEOPIEZOMETRY OF THE MESOPROTEROZOIC BASIN INFILLS OF THE EAST-CENTRAL PART OF KALADGI BASIN, SOUTHWESTERN INDIA Dr. M. K. Mukherjee (Guide); Applied Geology
110	Ritesh Kumar 2013/DR/0183 27.02.2020	DESIGN OF SOCIAL BOOK SEARCH: TECHNIQUES AND EVALUATION Dr. Rajendra Pamula (Guide); Computer Science and Engineering
111	Mohd. Azam 2014/DR/0220 27.02.2020	OPTICAL SPECTROSCOPY OF RARE EARTH DOPED MULTIFUNCTIONAL HEAVY METAL OXIDE GLASSES Dr. Vineet Kumar Rai (Guide); Applied Physics
112	Madan Kumar Das 2014/DR/0006 27.02.2020	A REDUCED COMPONENT SINGLE-PHASE ASYMMETRICAL MULTILEVEL INVERTER FOR A GRID CONNECTED PHOTOVOLTAIC SYSTEM Dr. K. C. Jana (Guide); Electrical Engineering
113	Mousoma Khatun 2013/DR/0118 27.02.2020	GEOLOGICAL CONSTRAINTS ON THE GOLD MINERALIZATION WITHIN THE CARBONACEOUS METASEDIMENATRY UNITS OF DALMA VOLCANO-SEDIMENTARY BELT, EASTERN INDIA Dr. Sahendra Singh (Guide); Applied Geology

2.5 Placements

STUDENTS PLACEMENT STATISTICS 2019-2020 BATCH			
4-Year B.Tech Programmes			
Programmes	Total Student Strength	Total Students Placed (Through In-Campus)	% of placement of Students in each branch
Chemical Engineering	22	11	50.00
Civil Engineering	43	14	32.56
Computer Science & Engineering	148	137	92.57
Electrical Engineering	96	60	62.50
Electronics & Communication Engg.	104	81	77.88
Electronics & Instrumentation Engg.	29	22	75.86
Engineering Physics	10	3	30.00
Environmental Engg.	23	12	52.17
Mechanical Engineering	103	59	57.28
Mineral Engineering	29	14	48.28
Mining Engineering	78	26	33.33
Mining Machinery Engineering	33	14	42.42
Petroleum Engineering	52	40	76.92
Total	770	493	64.03

Performance Highlights

5-Year Dual Degree Programmes			
Programmes	Total Student Strength	Total Students Placed (Through In-Campus)	% of placement of Students in each branch
B.Tech & M.Tech (Computer Science & Engg.)	17	13	76.47
B.Tech & M.Tech (Mineral Engineering)	6	4	66.67
B.Tech & M.Tech (Mining Engineering)	11	2	18.18
Total	34	19	55.88

5-Year Integrated M.Tech Programmes			
Programmes	Total Student Strength	Total Students Placed (Through In-Campus)	% of placement of Students in each branch
Applied Geology	7	4	57.14
Applied Geophysics	8	2	25.00
Mathematics & Computing	31	29	93.55
Total	46	35	76.09

3-Year M.Sc Tech Programmes			
Programmes	Total Student Strength	Total Students Placed (Through In-Campus)	% of placement of Students in each branch
Applied Geology	67	15	22.39
Applied Geophysics	39	7	17.95
Total	106	22	20.75

2-Year M.Sc Programmes			
Programmes	Total Student Strength	Total Students Placed (Through In-Campus)	% of placement of Students in each branch
Chemistry	45	1	2.22
Mathematics & Computing	43	1	2.33
Physics	32	0	0.00
Total	120	2	1.67

2-Year MBA Program			
Programmes	Total Student Strength	Total Students Placed (Through In-Campus)	% of placement of Students in each branch
MBA	44	15	34.09
Total	44	15	34.09

2-Year M.Tech Programmes			
Programmes	Total Student Strength	Total Students Placed (Through In-Campus)	% of placement of Students in each branch
Chemical Engineering	16	0	0.00
Computer Science & Engineering	48	21	43.75
Earthquake Science & Engineering	18	0	0.00
Engineering Geology	10	0	0.00
Environmental Science & Engineering	35	9	25.71
Geotechnical Engineering	12	1	8.33
Fuel Engineering	6	1	16.67
Geomatics	8	0	0.00
Industrial Engineering & Management	29	2	6.90
Mechanical Engineering	99	5	5.05
Mine Electrical Engg.	9	1	11.11
Mineral Exploration	4	0	0.00
Mineral Engineering	9	2	22.22
Mining Engineering	5	0	0.00
Mining Machinery Engineering	26	2	7.69
Opencast Mining	14	0	0.00
Petroleum Engineering	29	1	3.45
Petroleum Exploration	4	0	0.00
Power Electronics & Electrical Drives	20	3	15.00
Power System Engineering	21	6	28.57
Electronics & Communication Engineering	43	4	9.30
RF and Microwave Engineering	8	0	0.00
Structural Engineering	15	9	60.00
Tunneling & Underground Space Technology	9	0	0.00
Total	497	67	13.48

Performance Highlights

2.6 Scholarships

- Programme wise number of students benefitted with MCM Scholarship and Freeship for the Financial Year 2019-20:

S. No.	Programme	No. of Students				
		First Year	Second Year	Third Year	Fourth Year	Grand Total
1	Bachelor of Technology	84	151	210	184	629
	Freeship only	-	-	47	26	73
	Scholarship and Freeship	50	94	108	100	352
	Scholarship only	34	57	55	58	204
2	Integrated Master of Technology	7	8	17	17	49
	Freeship only	-	-	4	4	8
	Scholarship and Freeship	4	5	8	8	25
	Scholarship only	3	3	5	5	16
3	Master of Business Administration	1	9	-	-	10
	Freeship only	-	3	-	-	3
	Scholarship and Freeship	1	6	-	-	7
4	Master of Science	27	28	-	-	55
	Freeship only	4	7	-	-	11
	Scholarship and Freeship	23	21	-	-	44
5	Master of Science and Technology	20	19	28	-	67
	Freeship only	2	3	8	-	13
	Scholarship and Freeship	18	16	20	-	54
Grand Total		139	215	255	201	810

- Following students of Department of Mining Engineering received SME scholarships of USD 7200 organized by SME International.

Mr. Biblab Ghosh	Mr. Aditya Himanshu
Mr. Vishal Raj	Mr. Vivek Oraon
Mr. Chappidi Jagadeesh	Mr. Anant Singhal
Mr. Satyam Kumar	Mr. Nagam Ramsai

- Mr. Aditya Himanshu received Education Foundation Scholarship of USD \$4500 organized by Jerry McDowell Scholarship Fund.
- Mr. Vivek Oraon received Education Foundation Scholarship of USD \$4500 organized by Alex Senules Scholarship Fund.

2.7 Awards & Recognition

Awards and Recognition – Faculty Members

- Prof. D. P. Mishra was nominated as mining expert for the Forestry Research Advisory Committee in the Department of Forest, Environment & Climate Change, Govt. of Jharkhand by Conservator of Forest, Plantation, Research & Development, Jharkhand, Ranchi for Expertise in mine environment on April 9, 2019.
- Prof. Biswajit Chowdhury was awarded TUBITAK 2221 Fellowship by Republic of Turkey for Teaching and Research on May 22, 2019.
- Prof. B. S. Choudhary was awarded MEAI-2019 best paper by Mining Engineers association of India for best paper published in the journal on June 29, 2019.
- Prof. Bhabesh C. Sarkar was awarded MEAI-SRG Information Technology Award by Mining Engineers' Association of India for significant contributions in Information Technology for Mining and Mineral Industries on June 30, 2019.
- Prof. Sanjeev Kumar Raghuwanshi was awarded Rula International Research Peace Award by Idamas Learning Center, Malaysia for Research on Optical fibre sensor technology on August 15, 2019.
- Prof. Sowmiya Chawla was awarded IEI Young Engineers Award by Institution of Engineers India for Contribution in the field of Civil Engineering on September 1, 2019.
- Prof. Tajdarul Hassan Syed was awarded National Geoscience Award by Ministry of Mines for Applied Geology on September 19, 2019.
- Prof. M. K. Jain was awarded Prof (Dr) H. R. Anireddy Award for Mining Engineering Research for 2018 by The Indian Mining and Engineering Journal for Research in the field of Environment concerning Mining and allied areas, on September 21, 2019.
- Prof. Raghvendra Kumar Chaudhary was awarded Young Engineers Award by The Institution of Engineers, India in 2019-20 on October 19, 2019.
- Prof. Suresh Pandian Elumalai's Prototype of altered tail pipe design for Particulate Matter emission control was selected for display at an exhibition on clean air technologies, IIT Delhi, on November 6, 2019.
- Prof. N. R. Mandre was awarded Indian Institute of Mineral Engineers Awards 2018 by Indian Institute of Mineral Engineers for Research Achievement, on December 16, 2019.

Performance Highlights

- Prof. Keka Ojha was awarded Distinguished Faculty Achievement Award by Society of Petroleum Engineer for Outstanding contribution as Petroleum Engineering Faculty on November 29, 2019.
- Prof. Ajay Mandal was awarded Reservoir Description and Dynamics by Society of Petroleum Engineer for Outstanding contribution in Enhanced Oil Recovery on November 29, 2019.
- Prof. V. M. S. R. Murthy received the Institute of Engineers' "The Institution Prize" for a joint paper titled "Numerical modelling of pot-hole subsidence due to shallow underground coal mining in structurally disturbed ground" on December 27, 2019.
- Prof. Gajendra K. Vishwakarma was awarded Associate Fellow by International Academy of Physical Sciences, India for Valuable Contribution to Statistics on December 29, 2019.
- Prof. Ejaz Ahmad's article was selected for "Cover Page" in ACS Sustainable Chemistry and Engineering Journal of American Chemical Society, 2020 by American Chemical Society, USA for Publication on January 7, 2020.
- Prof. Ravi Kumar Gangwar was awarded INSA visiting Scientist fellowship for the year 2020-21, by Indian National Science Academy on March 2, 2020.
- Prof. Raghvendra Kumar Chaudhary was selected as Associate Editor by IET Microwaves, Antennas & Propagation, U.K, in September, 2019.
- Prof. Raghvendra Kumar Chaudhary was selected as Associate Editor by Microwave and Optical Technology Letters, Wiley, USA in July 2020.
- Prof. Anshumali was selected as Member of NERCS (Network of Experts & Resources for Subsurface Investigations and Remediation of Contaminated Sites), Network List, Ministry of Environment, Forest & Climate Change, Government of India for Network of Experts & Resources for Subsurface Investigations and Remediation of Contaminated Sites in 2019.
- Prof. V. M. S. R. Murthy was selected as Member, Board of Mining Examinations (Metal), Reg.11, MMR1961 by MoLE for the period 2017-2020.
- Prof. V. M. S. R. Murthy was selected as Member, Standing Committee on Mine Plan and Mine Closure Plan, MoC, Govt. of India by MoC up to October 31, 2019.
- Prof. R. M. Bhattacharjee was selected as Member, Board of Mining Examinations(Coal), Reg.10, CMR2017 by DGMS, MoLE for Member, Board of Mining Examinations(Coal), Reg.10, CMR2017 from February 24, 2020.

- Prof. R. M. Bhattacharjee was selected as Member, Standing Committee on Mine Plan and Mine Closure Plan, MoC, Govt. of India by MoC for Member, Standing Committee on Mine Plan and Mine Closure Plan, MoC, Govt. of India from November 1, 2019.

Awards and Recognition – Students

- Mr. Prithvi Singh Chauhan was the winner of SPE South Asia Regional Student Paper Contest organized by Society of Petroleum Engineers (SPE) International at Mumbai, on April 11, 2019.
- Mr. Ahmad Nawaz received Shastri Research Student Fellowship (SRSF) from Shastri Indo-Canadian Institute on November 21, 2019.
- Mr. Narendra Kumar Rawat received Best Research (Published technical paper with highest impact factor journal in year 2018-2019) organized by Inder Mohan Thapar Foundation Trust (Karam Chand Thapar Group) at Golden Jubilee Lecture Hall, IIT(ISM), Dhanbad, on December 9, 2019.
- Mr. Anupam Patel received Mitacs Internship Award organized by Global link at Western University, Ontario on December 15, 2019.
- Mr. Debosmit Banerjee secured 1st position among 20 international teams in the Schlumberger's Case Study organized by International Petroleum Technology Conference (IPTC) at Dhahran, Kingdom of Saudi Arabia on January 13, 2020.
- Mr. Vishnu Dhiren Gor received Toastmasters International Educational Awards organized by Toastmasters World Headquarters in Colorado, US on March 25, 2020.
- Mr. Vikash Kumar (Mechanical Engineering) secured GATE AIR-1.
- Mr. Priyanshu Maheswari (Mining Engineering) secured GATE AIR-1.
- Mr. Gaurav Kumar (Petroleum Engineering) secured GATE AIR-1.
- Mr. Rupam Raj (Electrical Engineering) secured GATE AIR-2.

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3.1 Research Publications

List of Publications Indexed in Web of Science Database for the Calender Year 2019:

- ❖ Abdalla, Mahmoud A.; Choudhary, Dilip Kumar; Chaudhary, Raghvendra Kumar, "A compact reconfigurable bandpass / lowpass filter with independent transmission zeros based on generalized NRI metamaterial", *International Journal of RF and Microwave Computer-Aided Engineering*, (30:3), 2020.
- ❖ Abdullahi, Mukaila; Kumar, Raj; Singh, Upendra K., "Magnetic basement depth from high-resolution aeromagnetic data of parts of lower and middle benue trough (Nigeria) using scaling spectral method", *Journal of African Earth Sciences*, (150), 2019, pp. 337-345.
- ❖ Abdullahi, Mukaila; Singh, Upendra K.; Roshan, Ravi, "Mapping magnetic lineaments and subsurface basement beneath parts of lower benue trough (LBT), Nigeria: insights from integrating gravity, magnetic and geologic data", *Journal of Earth System Science*, (128:1), 2019.
- ❖ Adhikari, Mainak; Amgoth, Tarachand, "An intelligent water drops-based workflow scheduling for IaaS cloud", *Applied Soft Computing*, (77), 2019, pp. 547-566.
- ❖ Adhikari, Mainak; Amgoth, Tarachand; Srirama, Satish Narayana, "A survey on scheduling strategies for workflows in cloud environment and emerging trends", *ACM Computing Surveys*, (52:4), 2019.
- ❖ Adhikari, Mainak; Nandy, Sudiirshan; Amgoth, Tarachand, "Meta heuristic-based task deployment mechanism for load balancing in IaaS cloud", *Journal of Network and Computer Applications*, (128), 2019, pp. 64-77.
- ❖ Adhikari, Sharmistha; Ray, Sangram; Biswas, Gosta P.; Obaidat, Mohammad S., "Efficient and secure business model for content centric network using elliptic curve cryptography", *International Journal of Communication Systems*, (32:1), 2019.
- ❖ Agarwal, Nirmal Kumar; Sadhu, Pradip Kumar; Chakraborty, Suprava, "MPPT based PMSG wind turbine system using sliding model control (SMC) and artificial neural network (ANN) based regression analysis", *IETE Journal of Research*, 2019.
- ❖ Agarwal, Saurabh; Mishra, Jitendra K.; Priye, Vishnu, "Augmenting performance of a MEMS cantilever-based photonic crystal waveguide for switching applications", *Applied Optics*, (58:31), 2019, pp. 8449-8456.
- ❖ Agasthian, A.; Pamula, Rajendra; Kumaraswamidhas, L. A., "Fault classification and detection in wind turbine using cuckoo-optimized support vector machine", *Neural Computing & Applications*, (31:5), 2019, pp. 1503-1511.
- ❖ Agrahari, Bhumika; Layek, Samaresh; Ganguly, Rakesh; Dege, Necmi; Pathak, Devendra D., "Synthesis, characterization and single crystal X-ray studies of pincer type Ni(II)-Schiff base complexes: application in synthesis of 2-substituted benzimidazoles", *Journal of Organometallic Chemistry*, (890), 2019, pp.13-20.
- ❖ Agrawal, Amit; Shrivastava, Ashish; Jana, Kartick C., "A universal input, single-stage AC-DC LED driver for an auditorium light", *Journal of Circuits Systems and Computers*, (28:2), 2019.
- ❖ Agrawal, Anil Kumar; Murthy, V. M. S. R.; Chattopadhyaya, Somnath, "Investigations into reliability, maintainability and availability of tunnel boring machine operating in mixed ground condition using Markov chains", *Engineering Failure Analysis*, (105), 2019, pp. 477-489.

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- ❖ Agrawal, Hemant; Mishra, A. K., "Modified scaled distance regression analysis approach for prediction of blast-induced ground vibration in multi-hole blasting", *Journal of Rock Mechanics and Geotechnical Engineering*, (11:1), 2019, pp. 202-207.
- ❖ Agrawal, Mohit; Pulliam, Jay; Sen, Mrinal K.; Grand, Stephen P., "Lithospheric removal beneath the eastern flank of the Rio grande rift from receiver function velocity analysis", *Geochemistry Geophysics Geosystems*, (20:2), 2019, pp. 974-991.
- ❖ Ahirwal, Bhagirath; Prasad, Rashmi; Kashyap, Sudhir Kumar; Banerjee, Gautam, "Stress analysis due to internal explosion pressure of designed flameproof enclosure for hazardous area", *Process Safety Progress*, (39:2), 2020.
- ❖ Ahmad, Ejaz; Rai, Surabhi; Padhi, Sumanta Kumar, "Proton reduction by a Ni(II) catalyst and foot-of-the wave analysis for H-2 evolution", *International Journal of Hydrogen Energy*, (44:31), 2019, pp. 16467-16477.
- ❖ Ahmad, I; Jayswal, Anurag; Al-Homidan, S.; Banerjee, Jonaki, "Sufficiency and duality in interval-valued variational programming", *Neural Computing & Applications*, (31:8), 2019, pp. 4423-4433.
- ❖ Aich, Subhajit; Nandi, Barun Kumar; Bhattacharya, Sumantra, "Effects of eucalyptus leaves blending on combustion characteristics of an Indian reject coal", *Energy Sources Part A-Recovery Utilization and Environmental Effects*, 2019.
- ❖ Aich, Subhajit; Nandi, Barun Kumar; Bhattacharya, Sumantra, "Utilization of sal leaves and sal leaves char to improve the combustion performance of reject coal", *Energy Sources Part A-Recovery Utilization and Environmental Effects*, (41:19), 2019, pp. 2299-2312.
- ❖ Akanksha; Singh, A. K.; Mohanty, D.; Jena, H. M.; Panwar, Deepak Singh, "Prospective evaluation of hydrocarbon generation potential of umarsar lignite, India", *Energy Sources Part A-Recovery Utilization and Environmental Effects*, (42:6), 2020, pp. 664-675.
- ❖ Akhtar, Fatima; Das, Niladri, "Predictors of investment intention in Indian stock markets extending the theory of planned behaviour", *International Journal of Bank Marketing*, (37:1), 2019, pp. 97-119.
- ❖ Alam, Jenifer; Chatterjee, Rima; Dasgupta, Sumangal, "Estimation of pore pressure, tectonic strain and stress magnitudes in the upper Assam basin: a tectonically active part of India", *Geophysical Journal International*, (216:1), 2019, pp. 659-675.
- ❖ Alam, Md Intaf; Kanagarajan, Baburaj; Jana, Prasun, "Optimal design of thin-walled open cross-section column for maximum buckling load", *Thin-Walled Structures*, (141), 2019, pp. 423-434.
- ❖ Alam, P.; Kundu, S.; Badruddin, I. A.; Khan, T. M. Y., "Dispersion and attenuation characteristics of love-type waves in a fiber-reinforced composite over a viscoelastic substrate", *Physics of Wave Phenomena*, (27:4), 2019, pp. 281-289.
- ❖ Alam, Shamshad; Das, Sarat Kumar; Rao, B. Hanumantha, "Strength and durability characteristic of alkali activated GGBS stabilized red mud as geo-material", *Construction and Building Materials*, (211), 2019, pp. 932-942.
- ❖ Alam, Tanjir; Thummalur, Sreenath Reddy; Chaudhary, Raghvendra Kumar, "Integration of MIMO and cognitive radio for sub-6 & x00A0 GHz 5G applications", *IEEE Antennas and Wireless Propagation Letters*, (18:10), 2019, pp. 2021-2025.
- ❖ Alam, Tanweer; Kumar, Rakesh, "Heat flux measurement analysis from thin film gauge in convective heat transfer mode", *Transactions of the Institute of Measurement and Control*, (41:1), 2019, pp. 64-73.
- ❖ Alamgir, Md.; Mallick, Ashis; Nayak, G. C.; Tiwari, Santosh K., "Development of PMMA/TiO₂ nanocomposites as excellent dental materials ", *Journal of Mechanical Science and Technology*, 2019.

- ❖ Alamgir, Md.; Mallick, Ashis; Nayak, G. C.; Tiwari, Santosh K., "Development of PMMA/TiO₂ nanocomposites as excellent dental materials", *Journal of Mechanical Science and Technology*, (33:10), 2019, pp. 4755-4760.
- ❖ Ali, S. Faizan; Mandal, N., "Design and development of an electronic level transmitter based on hydrostatic principle", *Measurement*, (132), 2019, pp. 125-134.
- ❖ Ali, Sayyed Faizan; Mandal, Nirupama, "Design and development of an electronic level transmitter using inter digital capacitor", *IEEE Sensors Journal*, (19:13), 2019, pp. 5179-5185.
- ❖ Ameen, M.; Ahmad, O.; Chaudhary, R. K., "Wideband circularly-polarised high-gain diversity antenna loaded with metasurface reflector for small satellite applications", *Electronics Letters*, (55:15), 2019, pp. 829-830.
- ❖ Ameen, M.; Chaudhary, R. K., "Metamaterial-based wideband circularly polarised antenna with rotated V-shaped metasurface for small satellite applications", *Electronics Letters*, (55:7), 2019, pp. 365-366.
- ❖ Ameen, Mohammad; Kalraiya, Sachin; Chaudhary, Raghvendra Kumar, "Coplanar waveguide-fed electrically small dual-polarized short-ended zeroth-order resonating antenna using omega-shaped capacitor and single-split ring resonator for GPS/WiMAX/WLAN/C-band applications", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:12), 2019.
- ❖ Antczak, Tadeusz; Jayswal, Anurag; Jha, Shalini, "The modified objective function method for univex multiobjective variational problems", *Bulletin of The Iranian Mathematical Society*, (45:1), 2019, pp. 267-282.
- ❖ Appasani, Bhargav; Prince, Pallav; Ranjan, Rajeev Kumar; Gupta, Nisha; Verma, Vijay Kumar, "A simple multi-band metamaterial absorber with combined polarization sensitive and polarization insensitive characteristics for terahertz applications", *Plasmonics*, (14:3), 2019, pp. 737-742.
- ❖ Aryan, Yash; Yadav, Pooja; Samadder, Sukha Ranjan, "Life cycle assessment of the existing and proposed plastic waste management options in India: a case study", *Journal of Cleaner Production*, (211), 2019, pp. 1268-1283.
- ❖ Asif, Mohammad; Naveen, Paul; Panigrahi, D. C.; Kumar, Sumit; Ojha, Keka, "Adsorption isotherms of CO₂ - CH₄ binary mixture using IAST for optimized ECBM recovery from sub-bituminous coals of Jharia coalfield: an experimental and modeling approach", *International Journal of Coal Preparation and Utilization*, (39:8), 2019, pp. 403-420.
- ❖ Asif, Mohammad; Panigrahi, D. C.; Naveen, Paul; Ojha, Keka, "Construction of high-pressure adsorption isotherm: a tool for predicting coalbed methane recovery from Jharia coalfield, India", *International Journal of Mining Science and Technology*, (29:5), 2019, pp. 765-769.
- ❖ Azam, Mohd; Rai, Vineet Kumar, "Effect of the addition of Pb₃O₄ and TiO₂ on the optical properties of Er³⁺/Yb³⁺:TeO₂-WO₃ glasses", *ACS Omega*, (4:15), 2019, pp. 16280-16291.
- ❖ Azam, Sikandar; Mishra, Devi Prasad, "Effects of particle size, dust concentration and dust-dispersion-air pressure on rock dust inertant requirement for coal dust explosion suppression in underground coal mines", *Process Safety and Environmental Protection*, (126), 2019, pp. 35-43.
- ❖ Azeem, Anas; Kumar, Rahul; Pal, Biswadeep; Naiya, Tarun Kumar, "Use of novel pour point depressant synthesized from vegetable oil for waxy crude oil", *Petroleum Science and Technology*, (38:3), 2020, pp. 185-193.
- ❖ Babu, Rohit; Bhattacharyya, Biplab, "Strategic placements of PMUs for power network observability considering redundancy measurement", *Measurement*, (134), 2019, pp. 606-623.

Research, Development, Innovation & Entrepreneurship

- ❖ Bage, Amit; Das, Sushrut, "Waveguide bandpass filter with multiple transmission zeros", *Electromagnetics*, (39:2), 2019, pp. 73-79.
- ❖ Balikram, Archana; Sinha, Supriya; Kumar, N. P. Deva; Ojha, Keka, "Characterization of porous media by chemical tracers using time-of-flight and residence time distribution concept", *Asia-Pacific Journal of Chemical Engineering*, (14:3), 2019.
- ❖ Bandyopadhyay, Anupam; Irfan, Mohd, "Gender-based tobacco policies in Bangladesh and India: a prerequisite to counter the smokeless tobacco epidemic", *Women & Health*, (59:1), 2019, pp. 85-100.
- ❖ Banerjee, Ashes; Pasupuleti, Srinivas, "Effect of convergent boundaries on post laminar flow through porous media", *Powder Technology*, (342), 2019, pp. 288-300.
- ❖ Banerjee, Ashes; Pasupuleti, Srinivas; Singh, Mritunjay Kumar; Dutta, Sekhar Chandra; Kumar, G. N. Pradeep, "Modelling of flow through porous media over the complete flow regime", *Transport in Porous Media*, (129:1), 2019, pp.1-23.
- ❖ Banerjee, Avik; Guria, Chandan; Maiti, Subodh Kumar; Banerjee, Chiranjib; Shukla, Pratyosh, "Carbon bio-fixation, effect of physicochemical factors and carbon supply strategies by nannochloropsis sp. using flue gas and fertilizer", *Biomass & Bioenergy*, (125), 2019, pp. 95-104.
- ❖ Banerjee, Chandra Madhab; Dutta, Saurabh; Baral, Arijit; Chakravorti, Sivaji, "Time-varying model for the effective diagnosis of oil-paper insulation used in power transformers", *IET Generation Transmission & Distribution*, (13:9), 2019, pp. 1527-1534.
- ❖ Banerjee, Chandra Madhab; Dutta, Saurabh; Beret, Arijit; Chakravorti, Sivaji, "Influence of charging voltage magnitude on time domain dielectric response of oil-paper insulation", *IET Science Measurement & Technology*, (13:6), 2019, pp. 874-882.
- ❖ Banerjee, Dhritiman; Kar, Asit Kumar, "Effect of hydroxide ion concentration on the evolution of nanostructures and structure correlated luminescence of ZnO nanopowders", *Optical Materials*, (89), 2019, pp. 430-440.
- ❖ Banerjee, Khushi; Singh, Divya; Paul, Sajal K., "Single VDTA based resistorless quadrature oscillator", *Analog Integrated Circuits and Signal Processing*, (100:2), 2019, pp. 495-500.
- ❖ Banerjee, Krishnendu; Jain, Manish Kumar; Jeyaseelan, A. T.; Panda, Surajit, "Landsat 8 OLI data for identification of hydrothermal alteration zone in Singhbhum shear zone using successive band depth difference technique - a new image processing approach", *Current Science*, (116:10), 2019, pp. 1639-1647.
- ❖ Banerjee, Lalima; Chawla, Sowmiya; Bhandari, Gupinath, "Experimental and 3-D finite element analyses on geocell-reinforced embankments", *Journal of Testing and Evaluation*, (47:3), 2019, pp. 1876-1899.
- ❖ Banerjee, Meenakshi; Dutta, Upama; Anand, R.; Atlas, Zachary D., "Insights on the process of two-stage coronae formation at olivine-plagioclase contact in mafic dyke from Palghat cauvery shear zone, southern India", *Mineralogy and Petrology*, (113:5), 2019, pp. 625-649.
- ❖ Banerjee, S.; Henning, Michael A.; Pradhan, D., "Algorithmic results on double Roman domination in graphs", *Journal of Combinatorial Optimization*, (39:1), 2020, pp. 90-114.
- ❖ Banerjee, S.; Keil, J. Mark; Pradhan, D., "Perfect Roman domination in graphs", *Theoretical Computer Science*, (796), 2019, pp. 1-21.
- ❖ Banerjee, Shantanu; Tiwade, Palas Balakdas; Sambhav, Kumar; Banerjee, Chiranjib; Bhaumik, Soubhik Kumar, "Effect of alginate concentration in wastewater nutrient removal using

- alginate-immobilized microalgae beads: uptake kinetics and adsorption studies", *Biochemical Engineering Journal*, (149), 2019.
- ❖ Banerjee, Susanta; Nayak, Sanket; Das, Sreekanta, "Enhancing the flexural behaviour of masonry wall using PP band and steel wire mesh", *Construction and Building Materials*, (194), 2019, pp. 179-191.
 - ❖ Banik, Anirban; Dutta, Suman; Bandyopadhyay, Tarun Kanti; Biswal, Sushant Kumar, "Prediction of maximum permeate flux (%) of disc membrane using response surface methodology (RSM)", *Canadian Journal of Civil Engineering*, (46:4), 2019, pp. 299-307.
 - ❖ Bardhan, Sudipta; Sahoo, Manodipan; Rahaman, Hafizur, "A surface potential-based model for dual gate bilayer graphene field effect transistor including the capacitive effects", *Journal of Circuits Systems and Computers*, (28:14), 2019.
 - ❖ Bardhan, Sudipta; Sahoo, Manodipan; Rahaman, Hafizur, "Boltzmann transport equation-based semi-classical drain current model for bilayer GFET including scattering effects", *IET Circuits Devices & Systems*, (13:4), 2019, pp. 456-464.
 - ❖ Bardhan, Sudipta; Sahoo, Manodipan; Rahaman, Hafizur, "Empirical drain current model of graphene field-effect transistor for application as a circuit simulation tool", *IETE Journal of Research*, 2019.
 - ❖ Barik, Prasanta K.; Shankar, Gauri; Sahoo, Pradeepta K., "Power quality assessment of microgrid using fuzzy controller aided modified SRF based designed SAPF", *International Transactions on Electrical Energy Systems*, (30:4), 2020.
 - ❖ Barman, Raktim; Halder, Lipika; Dutta, Sekhar Chandra; Sharma, Richi Prasad; Kumar, Sumit, "Effect of soil flexibility on seismic fragility of code-designed reinforced concrete framed buildings", *Structural Engineering International*, 2019.
 - ❖ Baruah, Saurabh; Bramha, Anjali; Sharma, Sangeeta; Baruah, Santanu, "Strong ground motion parameters of the 18 September 2011 Sikkim Earthquake M-w=6.9 and its analysis: a recent seismic hazard scenario", *Natural Hazards*, (97:3), 2019, pp. 1001-1023.
 - ❖ Behera, Dibyajyoti; Nandi, Barun Kumar; Bhattacharya, Smantra, "Chemical properties and combustion behavior of constituent relative density fraction of a thermal coal", *Energy Sources Part A-Recovery Utilization and Environmental Effects*, (41:6), 2019, pp. 654-664.
 - ❖ Behera, Girija Shankar; Sarkar, Bhabesh C.; Singh, Rahul Kumar; Singh, Sahendra, "Geology-aided geostatistical modelling of a ferruginous bauxite deposit in eastern India", *Journal of the Geological Society of India*, (94:1), 2019, pp. 62-68.
 - ❖ Behera, Ranjan K.; Parida, S. K.; Das, R. R., "Effect of the aspect ratio of the pre-existing rectangular adhesion failure on the structural integrity of the adhesively bonded single lap joint", *Journal of Adhesion Science and Technology*, (33:19), 2019, pp. 2093-2111.
 - ❖ Behera, Ranjan K.; Parida, S. K.; Das, R. R., "Three-dimensional adhesion failure analysis of the single lap joint having pre-embedded circular defects", *Journal of Strain Analysis for Engineering Design*, (54), 2019, pp. 293-309.
 - ❖ Behera, Rohit Pratyush; Rawat, Prashant; Singh, K. K.; Ha, Sung Kyu; Gaurav, Anand; Tiwari, Santosh K., "Fracture analysis and mechanical properties of three phased glass/epoxy laminates reinforced with multiwalled carbon nanotubes", *Journal of Science-Advanced Materials and Devices*, (4:2), 2019, pp. 299-309.
 - ❖ Behera, S. K.; Prashant; Ghosh, C. N.; Mishra, D. P.; Mandal, P. K.; Verma, Aniket; Mohanty, Sumeet; Mishra, Kanhaiya; Singh, P. K., "Slump test: laboratory and numerical simulation-based approach for consistency of mill tailings paste", *Current Science*, (117:2), 2019, pp. 235-241.

- ❖ Behera, Santosh Kumar; Mishra, D. P.; Ghosh, C. N.; Prashant; Mandal, P. K.; Singh, K. M. P.; Buragohain, J.; Singh, P. K., "Characterization of lead-zinc mill tailings, fly ash and their mixtures for paste backfilling in underground metalliferous mines", *Environmental Earth Sciences*, (78:14), 2019.
- ❖ Bhaduri, Kushanava; Das, Bidya Dhar; Kumar, Rawesh; Mondal, Sujan; Chatterjee, Sauvik; Shah, Sneha; Bravo-Suarez, Juan J.; Chowdhury, Biswajit, "Recyclable Au/SiO₂-shell/Fe₃O₄-core catalyst for the reduction of nitro aromatic compounds in aqueous solution", *ACS Omega*, (4:2), 2019, pp. 4071-4081.
- ❖ Bhardwaj, Prashant; Biswas, G. P.; Bhunia, Biswanath, "Docking-based inverse virtual screening strategy for identification of novel protein targets for triclosan", *Chemosphere*, (235), 2019, pp. 976-984.
- ❖ Bharti, Abhay Kumar; Pal, S. K.; Saurabh; Kumar, Sarvesh; Mondal, Subhendu; Singh, K. K. K.; Singh, P. K., "Detection of old mine workings over a part of Jharia coal field, India using electrical resistivity tomography", *Journal of the Geological Society of India*, (94:3), 2019, pp. 290-296.
- ❖ Bharti, Abhay Kumar; Pal, S. K.; Saurabh; Singh, K. K. K.; Singh, P. K.; Prakash, Amar; Tiwary, R. K., "Groundwater prospecting by the inversion of cumulative data of Wenner-Schlumberger and dipole-dipole arrays: a case study at Turamdih, Jharkhand, India", *Journal of Earth System Science*, (128:4), 2019.
- ❖ Bhattacharjee, Ankit; Dwari, Santanu; Mandal, Mrinal Kanti, "Polarization-reconfigurable compact monopole antenna with wide effective bandwidth", *IEEE Antennas and Wireless Propagation Letters*, (18:5), 2019, pp. 1041-1045.
- ❖ Bhattacharjee, Atanu; Vishwakarma, Gajendra K., "Time-course data prediction for repeatedly measured gene expression", *International Journal of Biomathematics*, (12:4), 2019.
- ❖ Bhattacharjee, Chiranjit; Saxena, V. K.; Dutta, Suman, "Novel thermal and non-thermal processing of watermelon juice", *Trends in Food Science & Technology*, (93), 2019, pp. 234-243.
- ❖ Bhattacharjee, Chiranjit; Saxena, V. K.; Dutta, Suman, "Static turbulence promoters in cross-flow membrane filtration: a review", *Chemical Engineering Communications*, (207:3), 2020, pp. 413-433.
- ❖ Bhattacharya, Labanya; Sahoo, Smruti R.; Sharma, Sagar; Sahu, Sridhar, "Effect of electron-withdrawing groups on photovoltaic performance of thiophene-vinyl-thiophene derivative and benzochalcogenadiazole based copolymers: a computational study", *International Journal of Quantum Chemistry*, (119:18), 2019.
- ❖ Bhattacharya, Satadru; Kumar, Hrishikesh; Guha, Arindam; Dagar, Aditya K.; Pathak, Sumit; Rani (Pasricha), Komal; Mondal, S.; Kumar, K. Vinod; Farrand, William; Chatterjee, Snehamoy; Ravi, S.; Sharma, A. K.; Rajawat, A. S., "Potential of airborne hyperspectral data for geo-exploration over parts of different geological/metallogenic provinces in India based on AVIRIS-NG observations", *Current Science*, (116:7), 2019, pp. 1143-1156.
- ❖ Bhattacharyya, Biplab; Karmakar, Nihar, "Optimal reactive power management problem: a solution using evolutionary algorithms", *IETE Technical Review*, 2019.
- ❖ Bhowmik, Subrata; Paul, Abhishek; Panua, Rajsekhar; Ghosh, Subrata Kumar; Debroy, Durbadal, "Artificial intelligence based gene expression programming (GEP) model prediction of diesel engine performances and exhaust emissions under diesosenol fuel strategies", *Fuel*, (235), 2019, pp. 317-325.
- ❖ Bhut, Parth Rajeshkumar; Pal, Nilanjan; Mandal, Ajay, "Characterization of hydrophobically modified polyacrylamide in mixed polymer-gemini surfactant systems for enhanced oil recovery application", *ACS Omega*, (4:23), 2019, pp. 20164-20177.

- ❖ Bihari, Shiv Prakash; Sadhu, Pradip Kumar; Das, Soumya; Arvind, P.; Gupta, Anagh, "Design and implementation of a photovoltaic wind hybrid system with the assessment of fuzzy logic maximum power point technique", *Revue Roumaine Des Sciences Techniques-Serie Electrotechnique Et Energetique*, (64:3), 2019, pp. 235-240.
- ❖ Billaha, Md. Aref; Das, Mukul K., "Performance analysis of AlGaAs / GaAs /InGaAs - based asymmetric long-wavelength QWIP", *Applied Physics A-Materials Science & Processing*, (125:7), 2019.
- ❖ Bishwakarma, Harish; Das, Alok Kumar, "Synthesis of zinc oxide nanoparticles through hybrid machining process and their application in supercapacitors", *Journal of Electronic Materials*, (49:2), 2020, pp. 1541-1549.
- ❖ Bishwal, R. M., "Scope of 3-D printing in mining and geology: an overview", *Journal of the Geological Society of India*, (93:4), 2019, pp. 482-486.
- ❖ Biswal, Sonika Priyadarsini; Das, Sushrut, "A compact printed ultra-wideband multiple-input multiple-output prototype with band-notch ability for WiMAX, LTEband43, and WLAN systems", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:6), 2019.
- ❖ Biswas, Amrita; Das, Dipankar; Lgaz, Hassane; Pal, Sagar; Nair, Udayabhanu G., "Biopolymer dextrin and poly (vinyl acetate) based graft copolymer as an efficient corrosion inhibitor for mild steel in hydrochloric acid: electrochemical, surface morphological and theoretical studies", *Journal of Molecular Liquids*, (275), 2019, pp. 867-878.
- ❖ Biswas, Koushik; Mandal, Prantik; Khan, Prosanta Kumar, "Estimation of coda Q for the eastern Indian craton", *Journal of Earth System Science*, (128:4), 2019.
- ❖ Biswas, Sauvik; Nayak, Paresh Kumar, "An unblocking assistance to distance relays protecting TCSC compensated transmission lines during power swing", *International Transactions on Electrical Energy Systems*, (29:8), 2019.
- ❖ Boothukuri, Veera Reddy; Bhattacharjee, Ram Madhav; Panigrahi, Durga Charan; Benerjee, Gautam, "Impact of geo technical factors on strata behavior in longwall panels of Godavari Valley coal field-a case study", *International Journal of Mining Science and Technology*, (29:2), 2019, pp. 335-34.
- ❖ Bouza, Carlos N.; Allende-Alonso, Sira M.; Vishwakarma, Gajendra K.; Singh, Neha, "Estimation of optimum sample size allocation: An illustration with body mass index for evaluating the effect of a dietetic supplement", *International Journal of Biomathematics*, (12:8), 2019.
- ❖ Burman, Isha; Sinha, Alok, "Performance evaluation and organic mass balance for treatment of high strength wastewater by anaerobic hybrid membrane bioreactor", *Environmental Progress & Sustainable Energy*, (39:2), 2020.
- ❖ Butchibabu, B.; Khan, Prosanta K.; Jha, P. C., "Foundation evaluation of a repeater installation building using electrical resistivity tomography and seismic refraction tomography", *Journal of Environmental and Engineering Geophysics*, (24:1), 2019, pp. 27-38.
- ❖ Butchibabu, B.; Khan, Prosanta Kumar; Jha, P. C., "Foundation evaluation of underground metro rail station using geophysical and geotechnical investigations", *Engineering Geology*, (248), 2019, pp. 140-154.
- ❖ Carach, Jan; Hloch, Sergej; Petru, Jana; Mueller, Miroslav; Hromasova, Monika; Nag, Akash; Cuha, Dominik; Hlavacek, Petr; Hatala, Michal; Kratochvil, Jiri; Ruggiero, Alessandro, "Evaluation of physical phenomena and surface integrity during hydroabrasive disintegration of the rotating workpiece with feedback loop control", *Measurement*, (134), 2019, pp.586-594.
- ❖ Cardoza, Savio; Das, Parthasarathi; Tandon, Vibha, "Pd-catalyzed sequential

- arylation of 7-azaindoles: aggregate-induced emission of tetra-aryl 7-azaindoles", *Journal of Organic Chemistry*, (84:21), 2019, pp. 14015-14029.
- ❖ Chakraborty, Avijit; Chakrabarti, Arijit; Sadhu, Pradip Kumar, "Analysis of a full-bridge direct AC-AC boost converter based domestic induction heater", *Revue Roumaine Des Sciences Techniques-Serie Electrotechnique Et Energetique*, (64:3), 2019, pp. 223-228.
 - ❖ Chakraborty, Avijit; Chakrabarti, Arijit; Sadhu, Pradip Kumar, "Source current harmonics suppression in domestic induction heater", *Revue Roumaine Des Sciences Techniques-Serie Electrotechnique Et Energetique*, (64:1), 2019, pp. 45-50.
 - ❖ Chakraborty, Debasrita; Narayanan, Vaasudev; Ghosh, Ashish, "Integration of deep feature extraction and ensemble learning for outlier detection", *Pattern Recognition*, (89), 2019, pp. 161-171.
 - ❖ Chakraborty, Kaustov; Mondal, Sandeep; Mukherjee, Kampan, "Critical analysis of enablers and barriers in extension of useful life of automotive products through remanufacturing", *Journal of Cleaner Production*, (227), 2019, pp. 1117-1135.
 - ❖ Chakraborty, Kaustov; Mondal, Sandeep; Mukherjee, Kampan, "A study on remanufacturing possibility of a product", *Microsystem Technologies-Micro-and Nanosystems-Information Storage and Processing Systems*, (25:5), 2019, pp. 1765-1770.
 - ❖ Chakraborty, Mitesh; Rai, Vineet Kumar; Mitra, Kuntal, "Investigation on the electrical and optical properties of some zinc titanate ceramics", *Pramana-Journal of Physics*, (92:3), 2019.
 - ❖ Chakraborty, Mohua; Roy, Dhrubojyoti; Sharma, Akash; Thangavel, R., "Post-treatment with ZnFe₂O₄ nanoparticles to improve photo-electrochemical performance of ZnO nanorods based photoelectrodes", *Solar Energy Materials and Solar Cells*, (200), 2019.
 - ❖ Chakraborty, Mohua; Thangavel, R.; Komninou, Philomela; Zhou, Ziyou; Gupta, Arunava, "Nanospheres and nanoflowers of copper bismuth sulphide (Cu₃BiS₃): colloidal synthesis, structural, optical and electrical characterization", *Journal of Alloys and Compounds*, (776), 2019, pp.142-148.
 - ❖ Chakraborty, Niladri; Subudhi, Priyambada; Mukhopadhyay, Susanta, "Shock filter-based morphological scheme for texture enhancement", *IET Image Processing*, (13:4), 2019, pp. 653-662.
 - ❖ Chakraborty, Sumeet; Dey, Tanish; Kumar, Rajesh, "Stability and vibration analysis of CNT-reinforced functionally graded laminated composite cylindrical shell panels using semi-analytical approach", *Composites Part B-Engineering*, (168), 2019, pp. 1-14.
 - ❖ Chakravarty, K.; Mishra, Vivek; Chakravarty, S.; Chakladar, S.; Saxena, V. K.; Bhattacharya, S., "Mineralogical study of beneficiated and carbonized Indian coking coal for better utilization: a case study", *Natural Resources Research*, 2019.
 - ❖ Chand, S.; Chand, S. K.; Paul, B.; Kumar, M., "Long-term leaching assessment of constituent elements from Linz-Donawitz slag of major steel industries in India", *International Journal of Environmental Science and Technology*, (16:10), 2019, pp. 6397-6404.
 - ❖ Chandra, Navin; Biswas, Shrutidhara; Rout, Janmejaya; Basu, Gautam; Tripathy, Umakanta, "Stability of beta-turn in LaR2C-N7 peptide for its translation-inhibitory activity against hepatitis C viral infection: a molecular dynamics study", *Spectrochimica Acta Part A-Molecular and Biomolecular Spectroscopy*, (211), 2019, pp. 26-33.
 - ❖ Chandra, S.; Kumar, V, "Structural, electronic and elastic properties of ZnGeN₂ and WZ-GaN under different hydrostatic pressures: a first-principle study", *International Journal of Modern Physics B*, (33:25), 2019.

- ❖ Chandra, S.; Sinha, Anita; Kumar, V, "Electronic and elastic properties of A(II)B(2)(III)C(4)(VI) defect-chalcopyrite semiconductors", *International Journal of Modern Physics B*, (33:28), 2019.
- ❖ Chandrakar, Preeti; Sinha, Sonam; Ali, Rifaqat, "Cloud-based authenticated protocol for healthcare monitoring system", *Journal of Ambient Intelligence and Humanized Computing*, 2019.
- ❖ Chattaraj, Sujoy; Mohanty, Debadutta; Kumar, Tarkeshwar; Halder, Gopinath; Mishra, Kanhaiya, "Comparative study on sorption characteristics of coal seams from Barakar and Raniganj formations of Damodar Valley Basin, India", *International Journal of Coal Geology*, (212), 2019.
- ❖ Chatterjee, A.; Singh, G. N.; Bandyopadhyay, A., "Estimation of population mean in successive sampling under super-population model in presence of random non response situations", *Communications in Statistics-Theory and Methods*, (48:15), 2019, pp. 3850-3863.
- ❖ Chatterjee, Abhijeet; Ranjan, Vinayak; Azam, Mohammad Sikandar; Rao, Mohan, "Comparison for the effect of different attachment of point masses on vibroacoustic behavior of parabolic tapered annular circular plate", *Applied Sciences-Basel*, (9:4), 2019.
- ❖ Chatterjee, Ayan; Singh, Mritunjay Kumar; Singh, Vijay P., "Groundwater contamination in mega cities with finite sources", *Journal of Earth System Science*, (129:1), 2019.
- ❖ Chatterjee, Binshati; Mandal, Sanjoy, "Z-domain modeling approach of a multilayer sextuple-coupled micro-ring resonator with 1 x 5 input-output bus waveguides as optical filters", *Applied Optics*, (58:28), 2019, pp. 7868-7877.
- ❖ Chatterjee, Debnath; Nayak, Sourav; Paul, Abhijit; Yadav, Somnath, "Syntheses of orthogonally protected d-galactosamine, d-allosamine and d-gulosamine thioglycoside building blocks with n-phthalimido groups", *Asian Journal of Organic Chemistry*, (8:11), 2019, pp. 2065-2072.
- ❖ Chatterjee, Subhashis; Das, Ananya, "A novel systematic approach to diagnose brain tumor using integrated type-II fuzzy logic and ANFIS (adaptive neuro-fuzzy inference system) model", *Soft Computing*, 2019.
- ❖ Chatterjee, Subhashis; Maji, Bappa; Hoang Pham, "A fuzzy rule-based generation algorithm in interval type-2 fuzzy logic system for fault prediction in the early phase of software development", *Journal of Experimental & Theoretical Artificial Intelligence*, (31:3), 2019, pp. 369-391.
- ❖ Chatterjee, Subhashis; Shukla, Ankur, "A unified approach of testing coverage-based software reliability growth modelling with fault detection probability, imperfect debugging, and change point", *Journal of Software-Evolution and Process*, (31:3), 2019.
- ❖ Chatterjee, Subhashis; Shukla, Ankur; Pham, Hoang, "Modeling and analysis of software fault detectability and removability with time variant fault exposure ratio, fault removal efficiency, and change point", *Proceedings of the Institution of Mechanical Engineers Part O-Journal of Risk and Reliability*, (233:2), 2019, pp. 246-256.
- ❖ Chaturvedi, Aaditya; Bhattacharjee, Santanu; Mondal, Gautam C.; Kumar, Vipin; Singh, Pradeep K.; Singh, Abhay K., "Exploring new correlation between hazard index and heavy metal pollution index in groundwater", *Ecological Indicators*, (97), 2019, pp. 239-246.
- ❖ Chaturvedi, Ekta; Patidar, Krishan; Laik, Sukumar; Mandal, Ajay, "Phase stability and kinetics of methane hydrate formation in presence of calcium and magnesium carbonate", *Marine Georesources & Geotechnology*, (37:1), 2019, pp. 57-66.
- ❖ Chaudhary, Soniya; Sahu, Sanjeev A.; Dewangan, Nidhi; Singhal, Abhinav, "Stresses produced due to moving load in a prestressed piezoelectric substrate",

- Mechanics of Advanced Materials and Structures, (26:12), 2019, pp. 1028-1041.
- ❖ Chaudhary, Soniya; Sahu, Sanjeev A.; Paswan, Brijendra, "Transference of SH waves through irregular interface between corrugated piezoelectric layer and prestressed viscoelastic substrate", *Mechanics of Advanced Materials and Structures*, (26:2), 2019, pp. 156-169.
 - ❖ Chaudhary, Soniya; Sahu, Sanjeev A.; Singhal, Abhinav; Nirwal, Sonal, "Interfacial imperfection study in prestressed rotating multiferroic cylindrical tube with wave vibration analytical approach", *Materials Research Express*, (6:10), 2019.
 - ❖ Chauhan, Geetanjali; Verma, Amit; Doley, Amolina; Ojha, Keka, "Rheological and breaking characteristics of Zr-crosslinked gum karaya gels for high-temperature hydraulic fracturing application", *Journal of Petroleum Science and Engineering*, (172), 2019, pp. 327-339.
 - ❖ Chauhan, Poonam; Kumar, Aditya; Bhushan, Bharat, "Self-cleaning, stain-resistant and anti-bacterial superhydrophobic cotton fabric prepared by simple immersion technique", *Journal of Colloid and Interface Science*, (535), 2019, pp. 66-74.
 - ❖ Chaurasia, Praveen; Kanaujia, Binod Kumar; Dwari, Santanu; Khandelwal, Mukesh Kumar, "Design and analysis of seven-bands-slot-antenna with small frequency ratio for different wireless applications", *AEU-International Journal of Electronics and Communications*, (99), 2019, pp. 100-109.
 - ❖ Chaurasia, Praveen; Kanaujia, Binod Kumar; Dwari, Santanu; Khandelwal, Mukesh Kumar, "Metamaterial based circularly polarized hexa-band patch antenna with small frequency ratios for multiple wireless applications", *Journal of Electromagnetic Waves and Applications*, (33:4), 2019, pp. 520-540.
 - ❖ Chawla, Amit; Pasupuleti, Srinivas; Chawla, Sowmiya; Rao, A. C. S.; Sarkar, Kripamoy; Dwivedi, Rajesh, "Landslide susceptibility zonation mapping: a case study from Darjeeling district, eastern himalayas, India", *Journal of the Indian Society of Remote Sensing*, (47:3), 2019, pp. 497-511.
 - ❖ Chawla, S.; Shahu, J. T.; Gupta, R. K., "Design methodology for reinforced railway tracks based on threshold stress approach", *Geosynthetics International*, (26:2), 2019, pp. 111-120.
 - ❖ Chejarla, S.; Thummaluru, S. R.; Chaudhary, R. K., "Flexible metamaterial absorber with wide incident angle insensitivity for conformal applications", *Electronics Letters*, (55:3), 2019, pp. 133-134.
 - ❖ Choudhary, Dilip Kumar; Abdalla, Mahmoud A.; Chaudhary, Raghvendra Kumar, "Compact D-CRLH resonator for low-pass filter with wide rejection band, high roll-off, and transmission zeros", *International Journal of Microwave and Wireless Technologies*, (11), 2019, pp. 509-516.
 - ❖ Choudhary, Dilip Kumar; Chaudhary, Raghvendra Kumar, "Compact metamaterial inspired structure with bandpass characteristics for penta-band applications using virtual ground concept", *Microwave and Optical Technology Letters*, (61:11), 2019, pp. 2628-2634.
 - ❖ Choudhary, R. B.; Kandulna, R., "2-D rGO impregnated circular-tetragonal-bipyramidal structure of PPY-TiO₂-rGO nanocomposite as ETL for OLED and supercapacitor electrode materials", *Materials Science in Semiconductor Processing*, (94), 2019, pp. 86-96.
 - ❖ Choudhary, R. B.; Mandal, Gobind, "MoS₂ decorated with graphene and polyaniline nanocomposite as an electron transport layer for OLED applications", *Journal of Materials Science-Materials in Electronics*, (31:2), 2020, pp. 1302-1316.
 - ❖ Choudhary, Ram B.; Majumder, Mandira; Thakur, Anukul K., "Two-dimensional exfoliated MoS₂ flakes integrated with polyindole for supercapacitor application",

- Chemistryselect, (4:23), 2019, pp. 6906-6912.
- ❖ Choudhary, Ram Bilash; Purty, Bela, "Integrating porous ZnS / rGO / PIn nanohybrid as binder free supercapacitive electrode material with extended cell potential and inflated energy density", Journal of Solid State Chemistry, (280), 2019, pp. 20-31.
 - ❖ Choudhary, Ram Bilash; Verma, Ajeet, "Augmented structural, optical and electrical properties of CDS decorated PANI/RGO nanohybrids", Optical Materials, (96), 2019.
 - ❖ Chowdhury, Kuntal; Chaudhuri, Debasis; Pal, Arup Kumar; Samal, Ashok, "Seed selection algorithm through K-means on optimal number of clusters", Multimedia Tools and Applications, (78:13), 2019, pp. 18617-18651.
 - ❖ Chowdhury, Sarmistha; Bhaumik, Ajoy K., "Palaeoceanographic changes in the bay of bengal during the holocene", Journal of The Palaeontological Society of India, (64:1), 2019, pp. 61-71.
 - ❖ Chowdhury, Srayoshi Roy; Chidambaram, C. T.; Podder, Debasish; Sasmal, Supriya; Debnath, Mintu; Kumaraswamidhas, L. A.; Dutta, Suman; Halder, Debasish, "A supramolecular gel to reduce tool wear and protect surfaces during metalworking", Chemistryselect, (4:10), 2019, pp. 2949-2953.
 - ❖ Das Adhikary, Satadru; Dutta, Sekhar Chandra, "Blast resistance and mitigation strategies of structures: present status and future trends", Proceedings of the Institution of Civil Engineers-Structures and Buildings, (172:4), 2019, pp. 249-266.
 - ❖ Das, Amrita; Singh, Abhishek Kumar; Patel, Prajnya Parimita; Mistri, Kshitish Ch; Chattopadhyay, Amares, "Reflection and refraction of plane waves at the loosely bonded common interface of piezoelectric fibre-reinforced and fibre-reinforced composite media", Ultrasonics, (94), 2019, pp. 131-144.
 - ❖ Das, Arka Jyoti; Mandal, Prabhat Kumar; Paul, Partha Sarathi; Sinha, Rabindra Kumar, "Generalised analytical models for the strength of the inclined as well as the flat coal pillars using rock mass failure criterion", Rock Mechanics and Rock Engineering, (52:10), 2019, pp. 3921-3946.
 - ❖ Das, Arka Jyoti; Mandal, Prabhat Kumar; Paul, Partha Sarathi; Sinha, Rabindra Kumar; Tewari, Subhashish, "Assessment of the strength of inclined coal pillars through numerical modelling based on the ubiquitous joint model", Rock Mechanics and Rock Engineering, (52:10), 2019, pp. 3691-3717.
 - ❖ Das, Ashmi Chakraborty; Dwari, Santanu; Biswal, Sonika Priyadarsini, "Applicability of cavity modeling technique to analyze complex waveguide structures involving cavity cross couplings", Wireless Personal Communications, (108:3), 2019, pp. 1431-1445.
 - ❖ Das, Bikash; Mukherjee, V.; Das, Debapriya, "Optimum DG placement for known power injection from utility/substation by a novel zero bus load flow approach", Energy, (175), 2019, pp. 228-249.
 - ❖ Das, Daisy; Nandi, Barun Kumar, "Arsenic removal from tap water by electrocoagulation: investigation of process parameters, kinetic analysis, and operating cost", Journal of Dispersion Science and Technology, 2019.
 - ❖ Das, Daisy; Nandi, Barun Kumar, "Defluoridization of drinking water by electrocoagulation (EC): process optimization and kinetic study", Journal of Dispersion Science and Technology, (40:8), 2019, pp. 1136-1146.
 - ❖ Das, Daisy; Nandi, Barun Kumar, "Removal of Fe (II) ions from drinking water using electrocoagulation (EC) process: parametric optimization and kinetic study", Journal of Environmental Chemical Engineering, (7:3), 2019.
 - ❖ Das, Gourab; Sahu, Nikesh Kumar; Sharma, Anand; Gangwar, Ravi Kumar; Sharawi, Mohammad S., "FSS-based

- spatially decoupled back-to-back four-port MIMO DRA with multidirectional pattern diversity", *IEEE Antennas And Wireless Propagation Letters*, (18:8), 2019, pp. 1552-1556.
- ❖ Das, Gourab; Sahu, Nikesh Kumar; Sharma, Anand; Gangwar, Ravi Kumar; Sharawi, Mohammad S., "Dielectric resonator-based four-element eight-port MIMO antenna with multi-directional pattern diversity", *IET Microwaves Antennas & Propagation*, (13:1), 2019, pp. 16-22.
 - ❖ Das, Gourab; Sharma, Anand; Gangwar, Ravi Kumar; Sharawi, Mohammad S., "Performance improvement of multiband MIMO dielectric resonator antenna system with a partially reflecting surface", *IEEE Antennas and Wireless Propagation Letters*, (18:10), 2019, pp. 2105-2109.
 - ❖ Das, Manbodh Kumar; Sarkar, Shibayan; Choudhary, Bhanwar Singh, "Structure analysis of a dragline tooth and its wear prediction", *Transactions of the Canadian Society for Mechanical Engineering*, (43:4), 2019, pp. 526-534.
 - ❖ Das, Mriganka; Biswas, Amrita; Kundu, Bidyut Kumar; Januario Charmier, M. Adilia; Mukherjee, Attreyee; Mobin, Shaikh M.; Udayabhanu, G.; Mukhopadhyay, Suman, "Enhanced pseudo-halide promoted corrosion inhibition by biologically active zinc(II) schiff base complexes", *Chemical Engineering Journal*, (357), 2019, pp. 447-457.
 - ❖ Das, Mukesh Kumar; Agrawal, Mohit; Gupta, Ravindra K.; Gautam, J. L., "Lithospheric seismic structure beneath two broadband station sites of the eastern part of Chhotanagpur plateau: new constraints from receiver functions and dispersion curves", *Physics of the Earth and Planetary Interiors*, (287), 2019, pp. 51-64.
 - ❖ Das, Pallabi; Dutta, Suman; Singh, K. K. K.; Maity, S., "Energy saving integrated membrane crystallization: a sustainable technology solution", *Separation and Purification Technology*, (228), 2019.
 - ❖ Das, Pallabi; Singh, Krishna Kant Kumar; Dutta, Suman, "Insight into emerging applications of forward osmosis systems", *Journal of Industrial and Engineering Chemistry*, (72), 2019, pp. 1-17.
 - ❖ Das, Pintu; Singh, Mritunjay Kumar, "One dimensional solute transport in porous formations with time-varying dispersion", *Journal of Porous Media*, (22:10), 2019, pp. 1207-1227.
 - ❖ Das, Prabal Shankar; Chatterjee, Rima; Dasgupta, Sumangal; Das, Ranajit; Bakshi, Debjani; Gupta, Mukesh, "Quantification and spatial distribution of pore-filling materials through constrained rock physics template and fluid response modelling in paleogene clastic reservoir from cauvery basin, India", *Geophysical Prospecting*, (67:1), 2019, pp. 150-166.
 - ❖ Das, Prangya Paramita; Prabhakaran, Vinod C.; Nanda, Samik; Sen, Debasis; Chowdhury, Biswajit, "Palladium impregnated amine co-condensed hexagonal mesoporous silica: a novel catalyst in tailoring suzuki and heck coupling reactions in base free condition", *Chemistryselect*, (4:13), 2019, pp. 3823-3832.
 - ❖ Das, Rakhi; Shaw, Krishnendu; Irfan, Mohd., "Supply chain network design considering carbon footprint, water footprint, supplier's social risk, solid waste, and service level under the uncertain condition", *Clean Technologies and Environmental Policy*, (22:2), 2020, pp. 337-370.
 - ❖ Das, Santosh Kumar; Tripathi, Sachin, "Energy efficient routing formation algorithm for hybrid ad-hoc network: a geometric programming approach", *Peer-to-Peer Networking and Applications*, (12:1), 2019, pp. 102-128.
 - ❖ Das, Shiladri S.; Mondal, Subhronil; Saha, Sandip; Bardhan, Subhendu; Saha, Ranita, "Family naticidae (gastropoda) from the upper jurassic of Kutch, India and a critical reappraisal of taxonomy and time of

- origination of the family", *Journal of Paleontology*, (93:4), 2019, pp. 673-684.
- ❖ Das, Sugandha; De, Moutusi; Singh, Vinod Kumar, "Single mode dispersion shifted photonic crystal fiber with liquid core for optofluidic applications", *Optical Fiber Technology*, (53), 2019.
 - ❖ Das, Sukanta; Kumar, Rakesh; Pal, Abhisek, "MRAS-based speed estimation of induction motor drive utilizing machines' d- and q-circuit impedances", *IEEE Transactions on Industrial Electronics*, (66:6), 2019, pp. 4286-4295.
 - ❖ Das, Suprotim; Patra, Priyapratim; Singha, Koushik; Biswas, Pinakpani; Sarkar, Supriya; Pal, Sagar, "Graft copolymeric flocculant using functionalized starch towards treatment of blast furnace effluent", *International Journal of Biological Macromolecules*, (125), 2019, pp. 35-40.
 - ❖ Das, Trupti R.; Sharma, Prashant K., "Sensitive and selective electrochemical detection of Cd²⁺ by using bimetal oxide decorated graphene oxide (Bi₂O₃/Fe₂O₃@GO) electrode", *Microchemical Journal*, (147), 2019, pp. 1203-1214.
 - ❖ Dasgupta, K.; Ghoshal, Sanjoy K.; Kumar, Sujit; Das, J., "Dynamic analysis of an open-loop proportional valve controlled hydrostatic drive", *Proceedings of the Institution of Mechanical Engineers Part E- Journal of Process Mechanical Engineering*, (233:6), 2019, pp. 1245-1256.
 - ❖ Dasgupta, S.; Chatterjee, R.; Mohanty, S. P.; Alam, J., "Pore pressure modelling in a compressional setting: a case study from Assam, NE India", *Journal of Petroleum Geology*, (42:3), 2019, pp. 319-338.
 - ❖ Dash, S. M.; Sahoo, S., "A study on natural convection in a cold square enclosure with two vertical eccentric square heat sources using the IB-LBM scheme", *Journal of Thermal Science and Engineering Applications*, (11:5), 2019.
 - ❖ Dash, Suman; Mohapatra, Smruti Sourava; Dey, Partha Pratim, "Estimation of critical gap of u-turns at uncontrolled median openings", *Transportation Letters-the International Journal of Transportation Research*, (11:5), 2019, pp. 229-240.
 - ❖ Datta, Jyotiska; Jana, Debaldev; Upadhyay, Ranjit Kumar, "Bifurcation and bio-economic analysis of a prey-generalist predator model with holling type IV functional response and nonlinear age-selective prey harvesting", *Chaos Solitons & Fractals*, (122), 2019, pp. 229-235.
 - ❖ De Adhikari, Amrita; Tiwari, Santosh K.; Ha, Sung Kyu; Nayak, Ganesh Chandra, "Boosted electrochemical performance of TiO₂ decorated RGO/CNT hybrid nanocomposite by UV irradiation", *Vacuum*, (160), 2019, pp. 421-428.
 - ❖ De, Moutusi; Gangopadhyay, Tarun Kumar; Singh, Vinod Kumar, "Prospects of photonic crystal fiber as physical sensor: an overview", *Sensors*, (19:3), 2019.
 - ❖ De, Moutusi; Pathak, Akhilesh Kumar; Singh, Vinod Kumar, "Single channel photonic crystal fiber based high sensitive petrol adulteration detection sensor", *Optik*, (183), 2019, pp. 539-546.
 - ❖ De, Moutusi; Singh, Vinod Kumar, "Multi-purpose photonic crystal fiber having advanced optical properties and long sensing range", *Photonics and Nanostructures-Fundamentals and Applications*, (36), 2019.
 - ❖ De, Sourav Kumar; Maiti, Subodh Kumar; Ghosh, Paresh Chandra; Paliwal, Lokesh, "Pulmonary function status of refractory workers in a steel plant: a cross-sectional study design", *Ethiopian Journal of Health Development*, (33:4), 2019, pp. 203-211.
 - ❖ Debata, Suryakanti; Banerjee, Sanchari; Chakraborty, Sanchari; Sharma, Prashant K., "Template assisted hydrothermal synthesis of CoSnO₃ hollow microspheres for electrocatalytic oxygen evolution reaction", *International Journal of Hydrogen Energy*, (44:39), 2019, pp. 21623-21636.
 - ❖ Debata, Suryakanti; Banerjee, Sanchari; Sharma, Prashant K., "Marigold shaped N-

Research, Development, Innovation & Entrepreneurship

- rGO-MoS₂-Ni(OH)₂ nanocomposite as a bifunctional electrocatalyst for the promotion of overall water splitting in alkaline medium", *Electrochimica Acta*, (303:), 2019, pp. 257-267.
- ❖ Deep, Amar; Kumar, Rakesh; Kumar, Naveen, "Studies on the use of orange peel oil and ethanol in an unmodified agricultural diesel engine", *Energy Sources Part A-Recovery Utilization and Environmental Effects*, (41:15), 2019, pp. 1817-1827.
 - ❖ Deepa, Arukula; Prakash, Prem; Mishra, Brijesh Kumar, "Performance of biochar-based filtration bed for the removal of Cr(VI) from pre-treated synthetic tannery wastewater", *Environmental Technology*, 2019.
 - ❖ Devarapalli, Ramesh; Bhattacharyya, Biplab, "A framework for H-2/H-infinity synthesis in damping power network oscillations with STATCOM", *Iranian Journal of Science and Technology-Transactions of Electrical Engineering*, (44:2), 2020, pp. 927-948.
 - ❖ Dewangan, Ashish; Yadav, Ashok Kumar; Mallick, Ashis; Pal, Amit; Singh, Shatrughan, "Comparative study of manilkara zapota and karanja based biodiesel properties and its effect on diesel engine characteristics", *Energy Sources Part A-Recovery Utilization and Environmental Effects*, 2019.
 - ❖ Dey, Anamika; Gupta, Anil K.; Singh, Gurdeep, "Innovation, investment and enterprise: climate resilient entrepreneurial pathways for overcoming poverty", *Agricultural Systems*, (172), 2019, pp. 83-90.
 - ❖ Dey, Anindita; Karmakar, Shreya; Mukherjee, Subham; Sanyal, Sanjoy; Dutta, Upama; Sengupta, Pulak, "High pressure metamorphism of mafic granulites from the Chotanagpur granite gneiss complex, India: evidence for collisional tectonics during assembly of rodinia", *Journal of Geodynamics*, (129), 2019, pp. 24-43.
 - ❖ Dey, Bishwajit; Bhattacharyya, Biplab, "Dynamic cost analysis of a grid connected microgrid using neighborhood based differential evolution technique", *International Transactions on Electrical Energy Systems*, (29:1), 2019.
 - ❖ Dey, Bishwajit; Bhattacharyya, Biplab; Sharma, Sharmistha, "Optimal sizing of distributed energy resources in a microgrid system with highly penetrated renewables", *Iranian Journal of Science and Technology-Transactions of Electrical Engineering*, (43), 2019, pp. 527-540.
 - ❖ Dey, Bishwajit; Roy, Shyamal Krishna; Bhattacharyya, Biplab, "Solving multi-objective economic emission dispatch of a renewable integrated microgrid using latest bio-inspired algorithms", *Engineering Science and Technology-an International Journal-Jestech*, (22:1), 2019, pp. 55-66.
 - ❖ Dey, Smita; Kar, Asit Kumar, "Enhanced photoluminescence through forster resonance energy transfer in polypyrrole-PMMA blends for application in optoelectronic devices", *Materials Science in Semiconductor Processing*, (103), 2019.
 - ❖ Dey, Swapan; Kumar, Ashish; Hira, Sumit Kumar; Manna, Partha Pratim, "Detection of Hg²⁺ ion using highly selective fluorescent chemosensor in real water sample and in-vitro cell study upon breast adenocarcinoma (MCF-7)", *Supramolecular Chemistry*, (31:6), 2019, pp. 382-390.
 - ❖ Dey, Tanish; Ramachandra, L. S., "Computation of worst geometric imperfection profiles of composite cylindrical shell panels by minimizing the non-linear buckling load", *Applied Mathematical Modelling*, (74), 2019, pp. 483-495.
 - ❖ Dhar, Mausumi; Samaddar, Shilpa; Bhattacharya, Paritosh; Upadhyay, Ranjit Kumar, "Viral dynamic model with cellular immune response: a case study of HIV-1 infected humanized mice", *Physica A-Statistical Mechanics and its Applications*, (524), 2019, pp. 1-14.

- ❖ Dhara, Saumen; Sadhu, Pradip Kumar; Shrivastav, Alok Kumar, "Modelling and analysis of an efficient DC reactor type superconducting fault current limiter circuit", *Revue Roumaine Des Sciences Techniques-Serie Electrotechnique Et Energetique*, (64:3), 2019, pp. 205-210.
- ❖ Dhawane, Sumit H.; Kumar, Tarkeshwar; Halder, Gopinath, "Insight into biodiesel synthesis using biocatalyst designed through lipase immobilization onto waste derived microporous carbonaceous support", *Process Safety and Environmental Protection*, (124), 2019, pp. 231-239.
- ❖ Dinh, H. Q.; Kumam, P.; Kumar, P.; Satpati, S.; Singh, A. K.; Yamaka, W., "MDS Symbol-Pair Repeated-Root Constacyclic Codes of Prime Power Lengths Over $F_{p^m} + uF(p^m)$ ", *IEEE Access*, (7), 2019, pp. 145039-145048.
- ❖ Dinh, Hai Q.; Singh, Abhay Kumar; Pattanayak, Sukhamoy; Sriboonchitta, Songsak, "Construction of cyclic DNA codes over the ring $Z(4)[u]/\langle u(2)-1 \rangle$ based on the deletion distance", *Theoretical Computer Science*, (773), 2019, pp. 27-42.
- ❖ Dodia, Shubham; Edla, Damodar Reddy; Bablani, Annushree; Ramesh, Dharavath; Kuppili, Venkatanareshbabu, "An efficient EEG based deceit identification test using wavelet packet transform and linear discriminant analysis", *Journal of Neuroscience Methods*, (314), 2019, pp. 31-40.
- ❖ Dubey, Ashwani Kumar; Samanta, Arunkumar; Sarkar, Pinaki; Dey, Runa; Saxena, Vinod Kumar, "Performance and kinetic evaluation of synthesized CuO/SBA-15 oxygen carrier for chemical looping with oxygen uncoupling", *Energy Technology*, (7:10), 2019.
- ❖ Dubey, R. K.; Shankar, Ravi, "Drainage pattern and its bearing on relative active tectonics of a region: a study in the Son valley, central India", *Journal of The Geological Society of India*, (93:6), 2019, pp. 693-703.
- ❖ Dutta, Joydip; Rai, Vineet Kumar, "APTES modified GO-PEI-E3+/Yb3+: NaYF4 upconverting nanoparticles hybrid film-based optical pH sensor and NIR photoelectric response", *IEEE Sensors Journal*, (19:10), 2019, pp. 3609-3615.
- ❖ Dutta, Joydip; Rai, Vineet Kumar; Durai, M. Malai; Thangavel, Rajalingam, "Development of Y2O3: Ho3+/Yb3+ upconverting nanophosphors for enhancing solar cell efficiency of dye-sensitized solar cells", *IEEE Journal of Photovoltaics*, (9:4), 2019, pp. 1040-1045.
- ❖ Dutta, Saurabh; Banerjee, Chandra Madhab; Baral, Arjit; Chatterjee, Biswendu; Dalai, Sovan; Chakravorti, Sivaji, "Neural network-based methodology to study effects of oil properties on induction period evaluated from response of oil-paper insulation employing mineral oil, ester, and mixture", *IET Science Measurement & Technology*, (13:4), 2019, pp. 606-613.
- ❖ Dutta, Saurabh; Mishra, Deepak; Haque, Nasirul; Pradhan, Arpan Kumar; Baral, Arijit; Chakravorti, Sivaji, "Influence of temperature on interfacial charge of power transformer insulation", *IET Science Measurement & Technology*, (13:7), 2019, pp. 1059-1067.
- ❖ Dwivedi, Ritesh; Singh, Pawan Kumar, "Numerical analysis of an evaporating thin film region: enticing influence of nanofluid", *Numerical Heat Transfer Part A-Applications*, (75:1), 2019, pp. 56-70.
- ❖ Ekbote, Anupkumar G.; Nainegali, Lohitkumar, "Interference of two closely spaced footings embedded in unreinforced and reinforced soil medium: a finite element approach using ABAQUS", *Arabian Journal of Geosciences*, (12:22), 2019.
- ❖ Fatima, A.; Venkatesh, A. S.; Mukherjee, R.; Agrawal, A. K.; Singh, B.; Sarkar, P. S.; Kashyap, Y.; Shripathi, T., "3D spatial distribution of ore mineral phases using high resolution synchrotron micro-computed tomography (μ CT) combined with optical microscopy", *Applied*

Research, Development, Innovation & Entrepreneurship

- Radiation And Isotopes, (148), 2019, pp. 49-59'
- ❖ Ganguli, Shuva Shankha; Singh, Satyaveer; Das, Niharika; Maurya, Deepak; Pal, Sanjit Kumar; Rao, J. V. Rama, "Gravity and magnetic survey in southwestern part of Cuddapah basin, India and its implication for shallow crustal architecture and mineralization", *Journal of the Geological Society of India*, (93:4), 2019, pp. 419-430.
 - ❖ Gangwar, Kapil; Sharma, Anand; Das, Gourab; Gangwar, Ravi K., "Investigation on novel wideband fractal antenna design based on cylindrical shape dielectric resonator" .*International Journal of RF and Microwave Computer-Aided Engineering*, (29:11), 2019.
 - ❖ Gangwar, Som Pal; Gangwar, Kapil; Kumar, Arun, "Dual band modified circular ring shaped slot antenna for GSM and WiMAX applications", *Microwave and Optical Technology Letters*, (61:12), 2019, pp. 2752-2759.
 - ❖ Gaurav, Anand; Singh, K. K., "Effect of pristine MWCNTs on the fatigue life of GFRP laminates-an experimental and statistical evaluation", *Composites Part B-Engineering*, (172), 2019, pp. 83-96.
 - ❖ Gaurav, Anand; Singh, K. K., "Safe design fatigue life of CNT loaded woven GFRP laminates under fully reversible axial fatigue: application of two-parameters Weibull distribution", *Plastics Rubber and Composites*, (48:7), 2019, pp. 293-306.
 - ❖ Gautam, Abhinav; Kumar, Amitesh; Priye, Vishnu, "Microseismic wave detection in coal mines using differential optical power measurement", *Optical Engineering*, (58:5), 2019.
 - ❖ Gautam, Abhinav; Sarkar, Prabir Kumar, "Continuum damage mechanics-based ductile behavior and fatigue life estimation of low carbon steels: AISI 1020 and AISI 1030", *Proceedings of the Institution of Mechanical Engineers Part L-Journal of Materials-Design and Applications*, (233:10), 2019, pp. 2057-2071.
 - ❖ Gautam, Gunjan; Mukhopadhyay, Susanta, "An adaptive localization of pupil degraded by eyelash occlusion and poor contrast", *Multimedia Tools and Applications*, (78:6), 2019, pp. 6655-6677.
 - ❖ Gautam, Gunjan; Raj, Aditya; Mukhopadhyay, Susanta, "Identifying twins based on ocular region features using deep representations", *Applied Intelligence*, 2019.
 - ❖ Ghosh, Anindya; Bhaduri, Kushanava; Shab, Sneha; Auroux, Aline; Pandey, J. K.; Chowdhury, Biswajit, "Dehydration of isopropanol to propylene over fullerene[C-60] containing niobium phosphate catalyst: Study on catalyst recyclability", *Molecular Catalysis*, (475), 2019.
 - ❖ Ghosh, Biswajit; Mandal, Sanjoy, "A generalized approach for modeling and analysis of fiber Bragg grating based cavity structures", *Optical and Quantum Electronics*, (52:1), 2019.
 - ❖ Ghosh, Chiranjit; Priye, Vishnu, "Suppression of four-wave mixing in a 22x10Gbps dense wavelength division multiplexed system by linearly chirped fiber Bragg gratings", *Optical and Quantum Electronics*, (51:1), 2019.
 - ❖ Ghosh, Kalyanbrata; Das, Sushrut, "A triple-band dual-polarized CRLH antenna for wireless applications", *Microwave and Optical Technology Letters*, (62:4), 2020, pp. 1671-1680.
 - ❖ Ghosh, Kalyanbrata; Das, Sushrut, "A CPW-fed band notched wideband circularly polarized ZOR antenna based on CRLH-TL approach", *International Journal of RF and Microwave Computer-Aided Engineering*, (30:1), 2020.
 - ❖ Ghosh, Prabhat Chandra; Sadhu, Pradip; Ghosh, Ankita, "Analysis of a three-coil contactless power transfer system for high-power applications", *Journal of the Chinese Institute of Engineers*, (42:3), 2019, pp. 189-199.
 - ❖ Ghosh, Rachit; Gupta, Sunil Kumar; Kumar, Anil; Kumar, Sanjay, "Durability and mechanical behavior of fly ash-

- GGBFS geopolymer concrete utilizing bottom ash as fine aggregate", Transactions of the Indian Ceramic Society, (78:1), 2019, pp. 24-33.
- ❖ Ghosh, Samaresh; Manna, Rajkumar; Dey, Swapan, "Epoxy-based polymer incorporating 1-naphthylamine and sebacic acid moieties: a selective fluorescent sensor for ferric ions", Journal of Molecular Structure, (1180), 2019, pp. 406-410.
 - ❖ Ghosh, Samaresh; Manna, Rajkumar; Dey, Swapan, "Polyurethane network using 1-naphthylamine embedded epoxy-based polymer: ferric ion selective fluorescent probe", Polymer Bulletin, (76:1), 2019, pp. 205-213.
 - ❖ Ghosh, Santosh; Yadav, Vinod Kumar; Mukherjee, Vivekananda, "Improvement of partial shading resilience of PV array through modified bypass arrangement", Renewable Energy, (143), 2019, pp.1079-1093.
 - ❖ Ghosh, Sayani; Koley, Kalyan; Sarkar, Chandan K., "Study of circuit performance and non quasi static effect in germanium tunnel FET for different temperatures", Microelectronics Journal, (90), 2019, pp. 204-210.
 - ❖ Ghosh, Shankhamala; De Adhikari, Amrita; Nath, Jyotishka; Nayak, Ganesh C.; Nayek, Hari Pada, "Lanthanide (III) metal-organic frameworks: syntheses, structures and supercapacitor application", Chemistryselect, (4:36), 2019, pp. 10624-10631.
 - ❖ Ghosh, Somaparna; Prabhakar, Roshan; Samadder, S. R., "Performance of -aluminium oxide nanoparticles for arsenic removal from groundwater", Clean Technologies and Environmental Policy, (21:1), 2019, pp. 121-138.
 - ❖ Ghosh, Sreya; Pan, Somnath, "Sensitivity model based PID controller for various high-order processes", Compel-the International Journal for Computation and Mathematics in Electrical and Electronic Engineering, (38:6), 2019, pp. 1855-1873.
 - ❖ Giri, A.; Anand, R.; Balakrishnan, S.; Dash, J. K.; Sarma, D. Srinivasa, "Neoproterozoic magmatism in Shimoga greenstone belt, India: evidence for subduction-accretion processes in the evolution of the western Dharwar stratigraphy", Lithos, (330), 2019, pp. 177-193.
 - ❖ Gogoi, Gautomi; Sahoo, Smruti R.; Rajbongshi, Basanta Kumar; Sahu, Sridhar; Sen Sarma, Neelotpal; Sharma, Sagar, "New types of organic semiconductors based on diketopyrrolopyrroles and 2,1,3-benzochalcogenadiazoles: a computational study", Journal of Molecular Modeling, (25:2), 2019.
 - ❖ Gogoi, Triveni; Chatterjee, Rima, "Estimation of petrophysical parameters using seismic inversion and neural network modeling in upper Assam basin, India", Geoscience Frontiers, (10:3), 2019, pp. 1113-1124.
 - ❖ Gokarn, Samir; Kuthambalayan, Thyagaraj S., "Creating sustainable fresh produce supply chains by managing uncertainties", Journal of Cleaner Production, (207), 2019, pp. 908-919.
 - ❖ Gondia, N. K.; Sharma, S. K., "Comparative optical studies of naphthalene based Schiff base complexes for colour tunable application", Materials Chemistry and Physics, (224), 2019, pp. 314-319.
 - ❖ Goswami, Anik; Basu, Subhajit; Sadhu, Pradip Kumar, "Improvement of energy efficiency and effectiveness of cooking for parabolic-type solar cooker used with activated-carbon-coated aluminium cooking pot", Global Challenges, (3:12), 2019.
 - ❖ Goswami, Abhiroop; Das Adhikary, Satadru, "Retrofitting materials for enhanced blast performance of structures: recent advancement and challenges ahead", Construction and Building Materials, (204), 2019, pp. 224-243.
 - ❖ Goswami, Abhiroop; Das Adhikary, Satadru; Li, Bing, "Predicting the punching shear failure of concrete slabs under low

- velocity impact loading", *Engineering Structures*, (184), 2019, pp. 37-51.
- ❖ Goswami, Anik; Sadhu, Paromita; Goswami, Utpal; Sadhu, Pradip Kumar, "Floating solar power plant for sustainable development: a techno-economic analysis", *Environmental Progress & Sustainable Energy*, (38:6), 2019.
 - ❖ Goswami, Anik; Sadhu, Paromita; Sadhu, Pradip Kumar, "Hybrid K based influential parameter determination and design optimization of 220 kV high voltage insulator", *Elektronika Ir Elektrotehnika*, (25:4), 2019, pp. 23-28.
 - ❖ Goswami, Rishikesh; Kumar, Rakesh, "Transient heat fluxes measurement analysis from platinum based thin film gauges in open and closed cavities", *Numerical Heat Transfer Part A-Applications*, (76:7), 2019, pp. 576-592.
 - ❖ Goswami, Rishikesh; Kumar, Rakesh, "Dynamic calibration of temperature sensors from light rays for transient measurement", *Thermal Science*, (23:3), 2019, pp.1901-1910.
 - ❖ Goya, Suman; Sahu, Sanjeev Anand; Mondal, Sonali, "Modelling of love-type wave propagation in piezomagnetic layer over a lossy viscoelastic substrate: Sturm-Liouville problem", *Smart Materials and Structures*, (28:5), 2019.
 - ❖ Gudala, Manojkumar; Banerjee, Shirsendu; Naiya, Tarun Kumar; Kumar, G. Suresh, "Experimental and correlation development of heavy oil viscosity using bio-additives", *Energy & Fuels*, (33:7), 2019, pp. 6313-6326.
 - ❖ Gudala, Manojkumar; Banerjee, Shirsendu; Naiya, Tarun Kumar; Mandal, Ajay; Subbaiah, T.; Rao, Rama Mohan T., "Hydrodynamics and energy analysis of heavy crude oil transportation through horizontal pipelines using novel surfactant", *Journal of Petroleum Science and Engineering*, (178), 2019, pp. 140-151.
 - ❖ Guha, S.; Singh, A. K.; Das, A., "Analysis on different types of imperfect interfaces between two dissimilar piezothermoelastic half-spaces on reflection and refraction phenomenon of plane waves", *Waves in Random and Complex Media*, 2019.
 - ❖ Gupta, Ashok Kumar; Singh, Roshan K.; Srivastava, Shalivahan, "Investigation of auriferous mineralisation over greenstone schist belt of Dhanjori basin, eastern India using 2D electrical resistivity tomography and induced polarisation surveys", *Exploration Geophysics*, (50:4), 2019, pp. 364-375.
 - ❖ Gupta, Deepika; Bag, Soumen, "Handwritten multilingual word segmentation using polygonal approximation of digital curves for Indian languages", *Multimedia Tools and Applications*, (78:14), 2019, pp. 19361-19386.
 - ❖ Gupta, Dhanoj; Choi, Heechol; Singh, Suvam; Modak, Paresh; Antony, Bobby; Kwon, Deuk-Chul; Song, Mi-Young; Yoon, Jung-Sik, "Total ionization cross section of cyclic organic molecules", *Journal of Chemical Physics*, (150:6), 2019.
 - ❖ Gupta, Gauri; Kumar, Vipin; Pal, A. K., "Microbial degradation of high molecular weight polycyclic aromatic hydrocarbons with emphasis on pyrene", *Polycyclic Aromatic Compounds*, (39:2), 2019, pp. 124-138.
 - ❖ Gupta, Naveen Kumar; Tiwari, Arun Kr; Verma, Sujit Kr; Rathore, Pushpendra Kr Singh; Ghosh, Subrata Kr, "A comparative study of thermal performance of a heat pipe using water and nanofluid, and a nanoparticle-coated wick heat pipe using water", *Heat Transfer Research*, (50:18), 2019, pp. 1767-1779.
 - ❖ Gupta, Pooja; Verma, Vijay Kumar; Ranjan, Rajeev Kumar; Appasani, Bhargav; Priyadarshini, Bindu; Nath, Vijay, "A series expansion method aided design of current mode second generation current conveyor based active control circuit", *Microsystem Technologies-Micro and Nanosystems-Information Storage and Processing Systems*, (25:6), 2019, pp. 2323-2330.

- ❖ Gupta, Pratihtha; Kumar, Vipin; Usmani, Zeba; Rani, Rupa; Chandra, Avantika; Gupta, Vijai Kumar, "A comparative evaluation towards the potential of klebsiella sp. and enterobacter sp. in plant growth promotion, oxidative stress tolerance and chromium uptake in helianthus annuus (L.)", Journal of Hazardous Materials, (377), 2019, pp. 391-398.
- ❖ Gupta, Radha; Gupta, Sunil Kumar; Pathak, Devendra Deo, "Selective adsorption of toxic heavy metal ions using guanine-functionalized mesoporous silica [SBA-16-g] from aqueous solution", Microporous and Mesoporous Materials, (288), 2019.
- ❖ Gupta, Radha; Layek, Samaresh; Pathak, Devendra Deo, "Synthesis and characterization of guanine-functionalized mesoporous silica [SBA-16-G]: a metal-free and recyclable heterogeneous solid base catalyst for synthesis of pyran-annulated heterocyclic compounds", Research on Chemical Intermediates, (45:3), 2019, pp. 1619-1637.
- ❖ Gupta, Ravindra K.; Agrawal, Mohit; Pal, Sanjit Kumar; Kumar, Rajwardhan; Srivastava, Saurabh, "Site characterization through combined analysis of seismic and electrical resistivity data at a site of Dhanbad, Jharkhand, India", Environmental Earth Sciences, (78:6), 2019.
- ❖ Gupta, S.; Bhengra, N., "Influence of magnetoelasticity on frequency equation of Shear wave propagation in a multilayered magnetoelastic anisotropic monoclinic medium", Applied Mathematics and Computation, (355), 2019, pp. 366-384.
- ❖ Gupta, Sandeep; Singharoy, Paresh Nath; Yadav, Rajeev Kumar; Catherine, Joshi K.; Burgmann, Roland; Gahalaut, Vineet K., "Anomalous transients in GPS measurements due to induced changes in local site conditions", Journal of Earth System Science, (128:7), 2019.
- ❖ Gupta, Shishir; Ahmed, Mostaid; Misra, Jagadis Chandra, "Effects of periodic corrugated boundary surfaces on plane SH-waves in fiber-reinforced medium over a semi-infinite micropolar solid under the action of magnetic field", Mechanics Research Communications, (95), 2019 ,pp. 35-44.
- ❖ Gupta, Shishir; Ahmed, Mostaid; Verma, Arun Kumar, "Analysis of rayleigh waves in micropolar thermoelastic solid over a dual-phase-lag semi-infinite thermoelastic substrate under interfacial imperfections", International Journal of Geomechanics, (19:5), 2019.
- ❖ Gupta, Shishir; Bhengra, Neelima, "Study of the surface wave vibrations in a functionally graded material layered structure: a WKB method", Mathematics and Mechanics of Solids, (24:4), 2019, pp. 1204-1220.
- ❖ Gupta, Shishir; Kundu, Santimoy; Pati, Prasenjit, "Torsional waves in a fiber composite medium at a loosely bonded interface constrained between dry sandy layer and gravitating poroelastic substrate", International Journal of Computational Methods, (16:6), 2019.
- ❖ Gupta, Shishir; Pramanik, Snehamoy; Smita; Verma, Arun Kumar, "A comparative analysis due to the effect of point source on generation of SH wave", Journal of Earth System Science, (128:6), 2019.
- ❖ Gupta, Shishir; Smita; Pramanik, Snehamoy; Pramanik, Abhijit, "Scattering of plane-wave through fluid medium of finite width between self-reinforced and triclinic half spaces", Waves in Random and Complex Media, 2019.
- ❖ Gupta, Shishir; Smita; Pramanik, Snehamoy; Pramanik, Abhijit," A comparative analysis (real-time data and theoretical results) for propagation of SH waves in a viscoelastic model influenced by a point source", Mathematics and Mechanics of Solids, (24:8), 2019, pp. 2458-2477.
- ❖ Gupta, Sunil Kumar; Elumalai, Suresh Pandian," Exposure to traffic-related particulate matter and deposition dose to auto rickshaw driver in Dhanbad, India",

Research, Development, Innovation & Entrepreneurship

- Atmospheric Pollution Research, (10:4), 2019, pp. 1128-1139.
- ❖ Gupta, Sunil Kumar; Elumalai, Suresh Pandian, "Dependence of urban air pollutants on morning/evening peak hours and seasons", Archives of Environmental Contamination and Toxicology, (76:4), 2019, pp. 572-590.
 - ❖ Gupta, Surbhi; Sharma, Anand; Das, Gourab; Gangwar, Ravi Kumar, "A dual-band circularly polarized antenna with aid of dual cylindrical dielectric resonator blocks", International Journal of RF and Microwave Computer-Aided Engineering, (29:4), 2019.
 - ❖ Gupta, Surbhi; Sharma, Anand; Das, Gourab; Gangwar, Ravi Kumar; Khalily, Mohsen, "Wideband circularly polarized dielectric resonator antenna array with polarization diversity", IEEE Access, (7), 2019, pp. 49069-49076.
 - ❖ Gupta, V. K., "An appraisal of the energy-size reduction relationships for mill scale-up design", Advanced Powder Technology, (30:1), 2019, pp. 73-84.
 - ❖ Gupta, Vinai. K., "Understanding the drawbacks of the currently popular approach to determining the breakage rate parameters for process analysis and mill scale-up design", Particulate Science and Technology, 2019.
 - ❖ Hasanuzzaman; Bhar, Chandan, "Development of a framework for sustainable improvement in performance of coal mining operations", Clean Technologies and Environmental Policy, (21:5), 2019, pp. 1091-1113.
 - ❖ Hazra, Bodhisatwa; Chandra, Debanjan; Singh, Ashok K.; Varma, Atul K.; Mani, Devleena; Singh, Pradeep K.; Boral, Prabal; Buragohain, John, "Comparative pore structural attributes and fractal dimensions of lower permian organic-matter-bearing sediments of two Indian basins: inferences from nitrogen gas adsorption", Energy Sources Part A-Recovery Utilization and Environmental Effects, (41:24), 2019, pp. 2975-2988.
 - ❖ Heydariha, Jamshid Zohreh; Ghaednia, Hossein; Nayak, Sanket; Das, Sreekanta; Bhattacharya, Subhamoy; Dutta, Sekhar Chandra, "Experimental and field performance of PP band-retrofitted masonry: evaluation of seismic behavior", Journal of Performance of Constructed Facilities, (33:1), 2019.
 - ❖ Hloch, Sergej; Adamcik, Pavel; Nag, Akash; Srivastava, Madhulika; Cuha, Dominik; Muller, Miroslav; Hromasova, Monika; Klich, Jiri, "Hydrodynamic ductile erosion of aluminium by a pulsed water jet moving in an inclined trajectory", Wear, (428), 2019, pp. 178-192.
 - ❖ Hloch, Sergej; Nag, Akash; Pude, Frank; Foldyna, Josef; Zelenak, Michal, "On-line measurement and monitoring of pulsating saline and water jet disintegration of bone cement with frequency 20 kHz", Measurement, (147), 2019.
 - ❖ Huda, Ramesh Kumar; Banka, Haider, "Efficient feature selection and classification algorithm based on PSO and rough sets", Neural Computing & Applications, (31:8), 2019, pp. 4287-4303.
 - ❖ Hussain, Manowar; Gupta, Pranshu; Kumar, P.; Das, A. K., "Selective laser melting of single track on Ti-6Al-4V powder: experimentation and finite element analysis", Arabian Journal for Science and Engineering, 2019.
 - ❖ Islavath, Sreenivasa Rao; Deb, Debasis; Kumar, Hemant, "Life cycle analysis and damage prediction of a longwall powered support using 3D numerical modelling techniques", Arabian Journal of Geosciences, (12:14), 2019.
 - ❖ Jain, Abhishek Kumar; Kanaujia, Binod Kumar; Dwari, Santanu; Pandey, Ganga Prasad; Singh, Dinesh Kumar, "Wideband circularly polarized magnetoelectric dipole antenna with I-slot for C-band applications", Journal of Computational Electronics, (18:2), 2019, pp. 660-670.
 - ❖ Jain, Ankit; Bajpai, Vivek, "Mechanical micro-texturing and characterization on Ti6Al4V for the improvement of surface

- properties", *Surface & Coatings Technology*, (380), 2019.
- ❖ Jain, Ankit; Kumar, Sanu; Bajpai, Vivek; Park, Hyung Wook, "Replacement of hazard lubricants by green coolant in machining of Ti6Al4V: A 3D FEM approach", *International Journal of Precision Engineering and Manufacturing*, (20:6), 2019, pp. 1027-1035.
 - ❖ Jain, Richa; Singh, Sarita; Verma, Santosh Kumar; Jain, Ankit, "Genome-wide prediction of potential vaccine candidates for campylobacter jejuni using reverse vaccinology", *Interdisciplinary Sciences-Computational Life Sciences*, (11:3), 2019, pp. 337-347.
 - ❖ Jaiswal, Anshul; Bhatnagar, Manav R.; Soni, Prashant; Jain, Virander Kumar, "Differential optical spatial modulation over atmospheric turbulence", *IEEE Journal of Selected Topics in Signal Processing*, (13:6), 2019, pp. 1417-1432.
 - ❖ Jana, Nabakumar; Kumar, Somesh, "Ordered classification rules for inverse gaussian populations with unknown parameters", *Journal of Statistical Computation and Simulation*, (89:14), 2019, pp. 2597-2620.
 - ❖ Jana, Nabakumar; Kumar, Somesh; Chatterjee, Kashinath, "Inference on stress-strength reliability for exponential distributions with a common scale parameter", *Journal of Applied Statistics*, (46:16), 2019, pp. 3008-3031.
 - ❖ Janani, K.; Ramasubramanian, S.; Thangavel, R.; Thiyagarajan, P., "Effect of gadolinium concentration on the luminescence of $\text{LiYF}_4:\text{Yb}^{3+}/\text{Er}^{3+}$ phosphor", *Solid State Sciences*, (91), 2019, pp. 119-125.
 - ❖ Jayswal, Anurag; Ahmad, Izhar; Kumari, Babli, "Vector variational inequalities on hadamard manifolds involving strongly geodesic convex functions", *Operations Research Letters*, (47:2), 2019, pp. 110-114.
 - ❖ Jayswal, Anurag; Antczak, Tadeusz; Jha, Shalini, "On equivalence between a variational problem and its modified variational problem with the α -objective function under invexity", *International Transactions in Operational Research*, (26:5), 2019, pp. 2053-2070.
 - ❖ Jayswal, Anurag; Choudhury, Sarita, "Convergence of exponential penalty function method for variational problems", *Proceedings of the National Academy of Sciences India Section A-Physical Sciences*, (89:3), 2019, pp. 517-524.
 - ❖ Jayswal, Anurag; Preeti, "Saddle point criteria for multi-dimensional control optimisation problem involving first-order PDE constraints", *International Journal of Control*, 2019.
 - ❖ Jayswal, Anurag; Singh, Vivek, "The characterization of efficiency and saddle point criteria for multi-objective optimization problem with vanishing constraints", *Acta Mathematica Scientia*, (39:2), 2019, pp. 382-394.
 - ❖ Jena, Silpa Sweta; Gharai, Mousumi; Mandre, N. R.; Venugopal, R., "Mineralogical characterization and gravity separation of lean grade mixed copper ore of malanjkhanda deposit", *Transactions of the Indian Institute of Metals*, (72:1), 2019, pp. 245-255.
 - ❖ Jena, Sridevi; Perwez, Atahar; Singh, Gurdeep, "Trace element characterization of fine particulate matter and assessment of associated health risk in mining area, transportation routes and institutional area of Dhanbad, India", *Environmental Geochemistry and Health*, (41:6), 2019, pp. 2731-2747.
 - ❖ Jha, Anupriya; Pradhan, D.; Banerjee, S., "The secure domination problem in cographs", *Information Processing Letters*, (145), 2019, pp. 30-38.
 - ❖ Jha, N. K.; Das, Deepankar; Tripathi, Ashutosh; Hota, R. N., "Acoustic damping: analytical prediction with experimental validation of mixed porosity liners and analytical investigation of conical liners", *Applied Acoustics*, (150), 2019, pp. 179-189.

Research, Development, Innovation & Entrepreneurship

- ❖ Jha, Shailesh Kumar; Narayanan, S.; Kumaraswamidhas, L. A., "Investigations of flow phenomena behind a flat plate with circular trailing edge", *Journal of the Brazilian Society of Mechanical Sciences and Engineering*, (41:5), 2019.
- ❖ Jha, Vandana Kumari; Bhaumik, Soubhik Kumar, "Enhanced heat dissipation in helically finned heat sink through swirl effects in free convection", *International Journal of Heat and Mass Transfer*, (138), 2019, pp. 889-902.
- ❖ Jindal, Sumit Kumar; Mahajan, Ankush; Raghuwanshi, Sanjeev Kumar, "An inductive-capacitive-circuit-based micro-electromechanical system wireless capacitive pressure sensor for avionic applications: preliminary investigations, theoretical modelling and simulation examination of newly proposed methodology", *Measurement & Control*, (52), 2019, pp. 1029-1038.
- ❖ Kaibartta, Tanusree; Giri, Chandan; Rahaman, Hafizur; Das, Debesh Kumar, "Approach of genetic algorithm for power-aware testing of 3D IC", *IET Computers and Digital Techniques*, (13:5), 2019, pp. 383-396.
- ❖ Kalraiya, S.; Chaudhary, R. K.; Abdalla, M. A.; Gangwar, R. K., "Polarisation independent dual-band conformal metamaterial absorber for X-band microwave application", *Electronics Letters*, (55:9), 2019.
- ❖ Kalraiya, Sachin; Ameen, Mohammad; Chaudhary, Raghvendra Kumar; Gangwar, Ravi Kumar, "Compact ultrathin conformal metamaterial dual-band absorber for curved surfaces", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:12), 2019.
- ❖ Kalraiya, Sachin; Chaudhary, Raghvendra Kumar; Abdalla, Mahmoud A., "Design and analysis of polarization independent conformal wideband metamaterial absorber using resistor loaded sector shaped resonators", *Journal of Applied Physics*, (125:13), 2019.
- ❖ Kalraiya, Sachin; Chaudhary, Raghvendra Kumar; Abdalla, Mahmoud A.; Gangwar, Ravi Kumar, "Polarization and incident angle independent metasurface absorber for X-Band application", *Materials Research Express*, (6:4), 2019.
- ❖ Kalraiya, Sachin; Chaudhary, Raghvendra Kumar; Gangwar, Ravi Kumar; Abdalla, Mahmoud A., "Compact quad-band polarization independent metamaterial absorber using circular/square metallic ring resonator", *Materials Research Express*, (6:5), 2019.
- ❖ Kamble, Alka D.; Saxena, Vinod K.; Chavan, Prakash D.; Singh, Bhagwan D.; Mendhe, Vinod A., "Petrographic and chemical reactivity assessment of Indian high ash coal with different biomass in fluidized bed co-gasification", *Journal of the Energy Institute*, (92:4), 2019, pp. 982-1004.
- ❖ Kamble, Alka D.; Saxena, Vinod Kumar; Chavan, Prakash Dhondiram; Mendhe, Vinod Atmaram, "Co-gasification of coal and biomass an emerging clean energy technology: status and prospects of development in Indian context", *International Journal of Mining Science and Technology*, (29:2), 2019, pp. 171-186.
- ❖ Kanapala, Ambedkar; Jannu, Srikanth; Pamula, Rajendra, "Summarization of legal judgments using gravitational search algorithm", *Neural Computing & Applications*, (31:12), 2019, pp. 8631-8639.
- ❖ Kanapala, Ambedkar; Jannu, Srikanth; Pamula, Rajendra, "Passage-based text summarization for legal information retrieval", *Arabian Journal for Science and Engineering*, (44:11), 2019, pp. 9159-9169.
- ❖ Kanapala, Ambedkar; Pal, Sukomal; Pamula, Rajendra, "Text summarization from legal documents: a survey", *Artificial Intelligence Review*, (51:3), 2019, pp. 371-402.
- ❖ Kandulna, R.; Choudhary, R. B.; Singh, R., "Free exciton absorptions and quasi-reversible redox actions in polypyrrole-polyaniline-zinc oxide nanocomposites as

- electron transporting layer for organic light emitting diode and electrode material for supercapacitors", *Journal of Inorganic and Organometallic Polymers and Materials*, (29:3), 2019, pp. 730-744.
- ❖ Karan, Shivesh Kishore; Ghosh, Somaparna; Samadder, Sukha Ranjan, "Identification of spatially distributed hotspots for soil loss and erosion potential in mining areas of upper Damodar basin - India", *Catena*, (182), 2019.
 - ❖ Karan, Sudip; Banerjee, Gourav; Panda, Binata, "Seeley-DeWitt coefficients in N=2 Einstein-Maxwell supergravity theory and logarithmic corrections to N=2 extremal black hole entropy", *Journal of High Energy Physics* (8), 2019.
 - ❖ Karati, Arijit; Biswas, G. P., "Provably secure and authenticated data sharing protocol for IoT-based crowdsensing network", *Transactions on Emerging Telecommunications Technologies*, (30:4), 2019.
 - ❖ Karfa, Paramita; Majhi, Kartick Chandra; Madhuri, Rashmi, "Group IV transition metal based phospho-chalcogenides@MoTe₂ for electrochemical hydrogen evolution reaction over wide range of pH", *International Journal of Hydrogen Energy*, (44:45), 2019, pp. 24628-2464.
 - ❖ Karmakar, Mampi; Maiti, Saumen, "Short term memory efficient pore pressure prediction via Bayesian neural networks at Bering Sea slope of IODP expedition 323", *Measurement*, (135), 2019, pp. 852-868.
 - ❖ Karmakar, Srabani; Biswas, Shrutidhara; Das, Kali P.; Tripathy, Umakanta, "Surface plasmon resonance study of the interaction of 4,4'-dianilino-1,1'-binaphthyl-5,5'-disulfonic acid dipotassium salt (bis-ANS) and adenosine triphosphate (ATP) with oligomeric recombinant human lens alpha A-crystallin", *Canadian Journal of Chemistry*, (97:6), 2019, pp. 504-511.
 - ❖ Kashyap, Kumari Somlata; Hira, Sumit Kumar; Dey, Swapan, "Photo-physical aspects of BODIPY-coumarin conjugated sensor and detection of Al³⁺ in MCF-7 cell", *Supramolecular Chemistry*, (31:11), 2019, pp. 695-702.
 - ❖ Kashyap, Kumari Somlata; Kumar, Ashish; Hira, Sumit Kumar; Dey, Swapan, "Recognition of Al³⁺ through the off-on mechanism as a proficient driving force for the hydrolysis of BODIPY conjugated Schiff base and its application in bio-imaging", *Inorganica Chimica Acta*, (498), 2019.
 - ❖ Kavikumar, J.; Tiwari, S. P.; Shamsidah, A. H. Nor; Sharan, S., "Restricted cascade and wreath products of fuzzy finite switchboard state machines", *Iranian Journal of Fuzzy Systems*, (16:1), 2019, pp. 75-88.
 - ❖ Ken, Bhupendra Singh; Nandi, Barun Kumar, "Desulfurization of high sulfur Indian coal by oil agglomeration using linseed oil", *Powder Technology*, (342), 2019, pp. 690-697.
 - ❖ Kesarwani, M.; Sarangi, S.; Srinivasan, R.; George, B. G.; Singh, S. K.; Bhattacharya, S.; Vasudev, V. N., "Origin of granodiorite hosted neoproterozoic orogenic gold ore deposits: stable isotopic and geochemical constraints with example from the Dharwar craton, southern India", *Ore Geology Reviews*, (107), 2019, pp. 754-779.
 - ❖ Kewat, Pramod Kumar; Kumar, Ram, "Hypergeometric functions and algebraic curves $y(e) = x(d) + ax + b$ ", *Journal of the Ramanujan Mathematical Society*, (34:3), 2019, pp. 325-342.
 - ❖ Kewat, Pramod Kumar; Kumari, Priti, "Cyclic codes from the first class two-prime Whiteman's generalized cyclotomic sequence with order 6", *Bulletin of the Korean Mathematical Society*, (56:2), 2019, pp. 285-301.
 - ❖ Khan, Arif Ali; Keung, Jacky; Niazi, Mahmood; Hussain, Shahid; Shameem, Mohammad, "GSEPIM: a roadmap for software process assessment and improvement in the domain of global software development", *Journal of Software-Evolution and Process*, (31:1), 2019.

Research, Development, Innovation & Entrepreneurship

- ❖ Khan, Arif Ali; Shameem, Mohammad; Kumar, Rakesh Ranjan; Hussain, Shahid; Yan, Xuefeng, "Fuzzy AHP based prioritization and taxonomy of software process improvement success factors in global software development", *Applied Soft Computing*, (83), 2019.
- ❖ Khan, Mohammad Yunus; Mandal, Ajay, "Vertical transmissibility assessment from pressure transient analysis with integration of core data and its impact on water and miscible water-alternative-gas injections", *Arabian Journal of Geosciences*, (12:8), 2019.
- ❖ Khan, Rahat Ullah; Bhattacharyya, Biplab; Singh, Gajendra, "Experimental study of modified dual slope hybrid photovoltaic (PV/T) solar thermal still", *Desalination and Water Treatment*, (156), 2019, pp. 168-176.
- ❖ Khanikar, Tulika; Singh, Vinod Kumar, "Gold grating assisted SPR based D-shaped single mode fiber for detection of liquid refractive index", *Optical and Quantum Electronics*, (51:9), 2019.
- ❖ Khanikar, Tulika; Singh, Vinod Kumar, "PANI-PVA composite film coated optical fiber probe as a stable and highly sensitive pH sensor", *Optical Materials*, (88), 2019, pp. 244-251.
- ❖ Khanikar, Tulika; Singh, Vinod Kumar; Sheoran, Jyoti, "A fiber optic refractive index sensor with a high index ZnO overlay", *Laser Physics*, (29:4), 2019.
- ❖ Khanum, Rizwana; Das, Nayan Mani; Moirangthem, Rakesh S., "Defect engineered ZnO whispering gallery modes via doping with alkali metal ions for label-free optical sensors", *Journal of Applied Physics*, (125:17), 2019.
- ❖ Khateb, Fabian; Kulej, Tomasz; Kumngern, Montree; Jaikla, Winai; Ranjan, Rajeev Kumar, "Comparative performance study of multiple-input bulk-driven and multiple-input bulk-driven quasi-floating-gate DDCCs", *AEU-International Journal of Electronics and Communications*, (108), 2019, pp. 19-28.
- ❖ Khatri, Vishwas Nandkishor; Kumar, Jyant, "Finite-element limit analysis of strip and circular skirted footings on sand", *International Journal of Geomechanics*, (19:3), 2019.
- ❖ Khatun, Mousoma; Singh, Sahendra; Chakravarti, Rajarshi, "Palaeo-weathering characteristics and nature of source lithology of a carbonaceous metasedimentary unit in the Dalma volcano-sedimentary belt, north Singhbhum mobile belt, Eastern India", *Journal of the Geological Society of India*, (94:1), 2019, pp. 53-61.
- ❖ Kishor, Jugul; Kanaujia, Binod K.; Dwari, Santanu; Kumar, Ashwani, "Balanced bandpass filter using TE₀₁ delta-mode dielectric resonator", *Electromagnetics*, (39:4), 2019, pp. 254-261.
- ❖ Kotia, Ankit; Ghosh, Gaurab Kumar; Srivastava, Isha; Deval, Piyush; Ghosh, Subrata Kumar, "Mechanism for improvement of friction/wear by using Al₂O₃ and SiO₂/Gear oil nanolubricants", *Journal of Alloys and Compounds*, (782), 2019, pp. 592-599.
- ❖ Kukreja, Jaspreet; Choudhary, Dilip Kumar; Chaudhary, Raghvendra Kumar, "A short-ended compact metastructure antenna with interdigital capacitor and U-shaped strip", *Wireless Personal Communications*, (108:4), 2019, pp. 2149-2158.
- ❖ Kukreja, Jaspreet; Choudhary, Dilip Kumar; Chaudhary, Raghvendra Kumar, "A metamaterial inspired ZOR antenna using IDC and spiral inductor with partial ground plane for WLAN application", *Wireless Personal Communications*, (107:1), 2019, pp. 137-147.
- ❖ Kumar, A.; Tiwari, S. P.; Kumar, K.; Esteves da Silva, Joaquim C. G., "Multifunctional applications of NaGdF₄:Ho³⁺/Yb³⁺ up-conversion phosphor synthesized via two different routes: a comparative study", *Materials Research Express*, (6:10), 2019.
- ❖ Kumar, Abhinav; Mahto, Vikas; Sharma, Virender Parkash, "Development of fly ash reinforced nanocomposite preformed

- particle gel for the control of excessive water production in the mature oil fields", *Oil & Gas Science and Technology-Revue D IFP Energies Nouvelles*, (74), 2019.
- ❖ Kumar, Abhinav; Panda, Sarat Kumar; Dutta, Sekhar Chandra; Kumar, Rajesh, "Vibration and buckling of skew plates under linearly varying edge compression", *International Journal of Acoustics and Vibration*, (24:2), 2019, pp. 271-283.
 - ❖ Kumar, Abhishek; da Silva, Luis Pinto; Esteves da Silva, Joaquim C. G.; Kumar, Kaushal, "Molecular vibration assisted triplet-triplet annihilation up-conversion luminescence of fluorescein", *Optical Materials*, (96), 2019.
 - ❖ Kumar, Abhishek; Esteves da Silva, Joaquim C. G.; Kumar, Kaushal; Swart, Hendrik C.; Maurya, Sachin K.; Kumar, Promod; Tiwari, Surya P., "Improvement in upconversion/downshifting luminescence of Gd₂O₃:Ho³⁺/Yb³⁺ phosphor through Ca²⁺/Zn²⁺ incorporation and optical thermometry studies", *Materials Research Bulletin*, (112), 2019, pp. 28-37.
 - ❖ Kumar, Abhishek; Tiwari, Surya Prakash; Kumar, Kaushal; Esteves da Silva, Joaquim C. G., "Magnetic tuning in upconversion emission enhanced through Ag⁺ ions co-doped in GdF₃:Ho³⁺/Yb³⁺ phosphor and a real-time temperature sensing demonstration", *Journal of Alloys and Compounds*, (776), 2019, pp. 207-214.
 - ❖ Kumar, Abhishek; Tiwari, Surya Prakash; Swart, Hendrik C.; Gomes Esteves da Silva, Joaquim Carlos, "Infrared interceded YF₃:Er³⁺/Yb³⁺ upconversion phosphor for crime scene and anti-counterfeiting applications", *Optical Materials*, (92), 2019, pp. 347-351.
 - ❖ Kumar, Ajay; Kumar, Manish; Jindal, Sumit Kumar; Raghuvanshi, Sanjeev Kumar, "Implementation of all-optical active low/high tri-state buffer logic using the micro-ring resonator structures", *Optical and Quantum Electronics*, (51:6), 2019.
 - ❖ Kumar, Ajit; Dasgupta, K.; Das, Jayanta, "Achieving constant speed of a hydrostatic drive using controlled operation of the pump and enhancing its energy efficiency", *ISA Transactions*, (90), 2019, pp. 189-201.
 - ❖ Kumar, Akash; Layek, Samaresh; Agrahari, Bhumika; Kujur, Shelly; Pathak, Devendra Deo, "Graphene oxide immobilized copper(II) schiff base complex [GO@AF-SB-Cu]: a versatile catalyst for Chan-Lam coupling reaction", *Chemistryselect*, (4:4), 2019, pp. 1337-1345.
 - ❖ Kumar, Amallesh; Manam, J., "Color tunable emission and temperature dependent photoluminescence properties of Eu³⁺ co-doped Gd₂Zr₂O₇:Dy³⁺ phosphors", *Optical Materials*, (96), 2019.
 - ❖ Kumar, Amit; Kumari, Archana; Asu, Shwetank; Laha, Dipranjan; Sahu, Sumanta Kumar, "Synthesis of CDs from beta-cyclodextrin for smart utilization in visual detection of cholesterol and cellular imaging", *Chemistryselect*, (4:48), 2019, pp. 14222-14227.
 - ❖ Kumar, Amit; Mandal, Ajay, "Critical investigation of zwitterionic surfactant for enhanced oil recovery from both sandstone and carbonate reservoirs: Adsorption, wettability alteration and imbibition studies", *Chemical Engineering Science*, (209), 2019.
 - ❖ Kumar, Amit; Mandal, Amitava; Dixit, Amit Rai; Das, Alok Kumar; Kumar, Saroj; Ranjan, Rachit, "Comparison in the performance of EDM and NPMEDM using Al₂O₃ nanopowder as an impurity in DI water dielectric", *International Journal of Advanced Manufacturing Technology*, (100), 2019, pp. 1327-1339.
 - ❖ Kumar, Amit; Saw, Rohit Kumar; Mandal, Ajay, "RSM optimization of oil-in-water microemulsion stabilized by synthesized zwitterionic surfactant and its properties evaluation for application in enhanced oil recovery", *Chemical Engineering Research & Design*, (147), 2019, pp. 399-411.
 - ❖ Kumar, Amit; Sharma, Kamal; Dixit, Amit Rai, "Carbon nanotube- and graphene-

Research, Development, Innovation & Entrepreneurship

- reinforced multiphase polymeric composites: review on their properties and applications", *Journal of Materials Science*, (55:7), 2020, pp. 2682-2724.
- ❖ Kumar, Amit; Sharma, Kamal; Dixit, Amit Rai, "A review on the mechanical and thermal properties of graphene and graphene-based polymer nanocomposites: understanding of modelling and MD simulation", *Molecular Simulation*, 2019.
 - ❖ Kumar, Amit; Sharma, Kamal; Dixit, Amit Rai, "A review of the mechanical and thermal properties of graphene and its hybrid polymer nanocomposites for structural applications", *Journal of Materials Science*, (54:8), 2019, pp. 5992-6026.
 - ❖ Kumar, Amrit; Mandal, Deepak Kumar, "Influence of the surface temperature on the spreading and receding dynamics of an impacting biodiesel drop", *Heat and Mass Transfer*, (56:2), 2020, pp. 445-457.
 - ❖ Kumar, Amrit; Mandal, Deepak Kumar, "Impact of emulsion drops on a solid surface: the effect of viscosity", *Physics of Fluids*, (31:10), 2019.
 - ❖ Kumar, Anand; Raman, Rahul; Sadhu, Pradip Kumar, "Dynamic behavior improvement of induction heating converters using fuzzy logic controller", *Revue Roumaine Des Sciences Techniques-Serie Electrotechnique ET Energetique*, (64:2), 2019, pp. 163-168.
 - ❖ Kumar, Arbind; Das, L. K.; Roy, P. N. S.; Singh, A. K., "Prognosticating buried potential mineral deposits in virgin areas of Odisha and adjoining regions, India, using 3D Euler's deconvolution technique on gravity data for detailed exploration in future", *Ore Geology Reviews*, (104), 2019, pp. 373-383.
 - ❖ Kumar, Ashish; Singh, Narendra; Singh, Anshumali, "Observations on the distribution of clouds over northern India using joint CloudSat and CALIPSO measurements", *Remote Sensing Letters*, (10:6), 2019, pp. 590-597.
 - ❖ Kumar, Ashok; Kumar, Dheeraj; Singh, Arun Kumar; Ram, Sahendra; Kumar, Rakesh; Gautam, Abhishek; Singh, Rajendra; Singh, Amit Kumar, "Roof sagging limit in an early warning system for safe coal pillar extraction", *International Journal of Rock Mechanics and Mining Sciences*, (123), 2019.
 - ❖ Kumar, Ashvani; Samadder, S. R.; Kumar, Vipin, "Assessment of groundwater contamination risk due to fly ash leaching using column study", *Environmental Earth Sciences*, (78:1), 2019.
 - ❖ Kumar, Ashwani; Ghosh, Subrata Kumar, "Size distribution analysis of wear debris generated in HEMM engine oil for reliability assessment: a statistical approach", *Measurement*, (131), 2019, pp. 412-418.
 - ❖ Kumar, B.; Seth, G. S., "MHD stagnation point transient flow of nanofluid past a stretching sheet: SRM approach", *Latin American Applied Research*, (49:3), 2019, pp. 205-211.
 - ❖ Kumar, B.; Seth, G. S.; Nandkeolyar, R., "Successive linearisation approach to analyse thermally radiative stagnation point micropolar nanofluid flow with regression model", *Pramana-Journal of Physics*, (93:5), 2019.
 - ❖ Kumar, B.; Seth, G. S.; Nandkeolyar, R., "Regression model and successive linearization approach to analyse stagnation point micropolar nanofluid flow over a stretching sheet in a porous medium with nonlinear thermal radiation", *Physica Scripta*, (94:11), 2019.
 - ❖ Kumar, B.; Seth, G. S.; Nandkeolyar, R., "Quadratic multiple regression model and spectral relaxation approach to analyse stagnation point nanofluid flow with second-order slip", *Proceedings of the Institution of Mechanical Engineers Part E-Journal of Process Mechanical Engineering*, (234:1), 2020, pp. 3-14.
 - ❖ Kumar, B.; Seth, G. S.; Nandkeolyar, R.; Chamkha, A. J., "Outlining the impact of induced magnetic field and thermal radiation on magneto-convection flow of

- dissipative fluid", *International Journal of Thermal Sciences*, (146), 2019.
- ❖ Kumar, Bijendra; Anshumali, "Phosphorus fractionation in surface water and sediments of industrially polluted freshwater reservoir, India", *Chemistry and Ecology*, (35:3), 2019, pp. 219-234.
 - ❖ Kumar, Bittu, "Real-time performance evaluation of modified cascaded median-based noise estimation for speech enhancement system", *Fluctuation and Noise Letters*, (18:4), 2019.
 - ❖ Kumar, D. Praveen; Amgoth, Tarachand; Annavarapu, Chandra Sekhara Rao, "Machine learning algorithms for wireless sensor networks: a survey", *Information Fusion*, (49), 2019, pp. 1-25.
 - ❖ Kumar, Deepak; Sourav, Kumar; Sen, Subhankar, "Steady separated flow around a pair of identical square cylinders in tandem array at low Reynolds numbers", *Computers & Fluids*, (191), 2019.
 - ❖ Kumar, Deepak; Sourav, Kumar; Yadav, Pavan Kumar; Sen, Subhankar, "Understanding the secondary separation from an inclined square cylinder with sharp and rounded trailing edges", *Physics of Fluids*, (31:7), 2019.
 - ❖ Kumar, Dhiraj; Singh, K. K., "Investigation of delamination and surface quality of machined holes in drilling of multiwalled carbon nanotube doped epoxy/carbon fiber reinforced polymer nanocomposite", *Proceedings of The Institution of Mechanical Engineers Part L-Journal of Materials-Design and Applications*, (233:4), 2019, pp. 647-663.
 - ❖ Kumar, Dhiraj; Singh, Kalyan Kumar, "Effect of nanofiller on fibre laser drilling quality of carbon fibre reinforced polymer composite laminates", *Proceedings of The Institution of Mechanical Engineers Part E-Journal of Process Mechanical Engineering*, (233:4), 2019, pp. 857-870.
 - ❖ Kumar, Hemant; Ahmad, Gulshad Nawaz; Singh, N. K., "Activated flux TIG welding of Inconel 718 super alloy in presence of tri-component flux", *Materials and Manufacturing Processes*, (34:2), 2019, pp. 216-223.
 - ❖ Kumar, Kamlesh; Zeeshan, Sayed Mohammed, "Improved two phase sampling exponential ratio and product type estimators for population mean of study character in the presence of non response", *Communications in Statistics-Theory and Methods*, (48:9), 2019, pp. 2305-2319.
 - ❖ Kumar, Karavalasu Velusamy Mahesh; Krishnamurthy, Kasilingam; Rajasekar, Rathanasamy; Kumar, Palaniappan Sathish; Pal, Kaushik; Nayak, Ganesh Chandra, "Influence of graphene oxide on the static and dynamic mechanical behavior of compatibilized polypropylene nanocomposites", *Materials Testing*, (61:10), 2019, pp. 986-990.
 - ❖ Kumar, Kundan; Dwari, Santanu, "Compact four-element MIMO SIW cavity backed slot antenna with high front-to-back ratio", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:1), 2019.
 - ❖ Kumar, Manoj; Askari, S. S. Anwer; Das, Mukul K., "Oxygen controlled E-beam evaporation deposited p-SnOx thin film for photosensitive devices", *Materials Letters*, (257), 2019.
 - ❖ Kumar, Mohan; Bajpai, Vivek, "Experimental investigation of top burr formation in high-speed micro-milling of Ti6Al4V alloy", *Proceedings of the Institution of Mechanical Engineers Part B-Journal of Engineering Manufacture*, (234:4), 2020, pp. 730-738.
 - ❖ Kumar, Mukesh; Das, Sukanta; Kiran, Karuna, "Sensorless speed estimation of brushless doubly-fed reluctance generator using active power based MRAS", *IEEE Transactions on Power Electronics*, (34:8), 2019, pp. 7878-7886.
 - ❖ Kumar, Mukul; Das, Randip Kumar, "Experimental analysis of absorption refrigeration system driven by waste heat of diesel engine exhaust", *Thermal Science*, (23:1), 2019, pp. 149-157.

- ❖ Kumar, N. Mathan; Kumaraswamidhas, Lalzshmi Annamalai, "Characterization and tribological analysis on AA 6061 reinforced with AlN and ZrB₂ in situ composites", *Journal of Materials Research and Technology-JMR&T*, (8:1), 2019, pp. 969-980.
- ❖ Kumar, Niwas; Banerjee, Chiranjib; Kumar, Niraj; Jagadevan, Sheeja, "A novel non-starch based cationic polymer as flocculant for harvesting microalgae", *Bioresource Technology*, (271), 2019, pp. 383-390.
- ❖ Kumar, Pankaj; Sharma, Himanshu; Pal, Nitai; Sadhu, Pradip Kumar, "Comparative assessment and obstacles in the advancement of renewable energy in India and China", *Problemy Ekorozwoju*, (14:2), 2019, pp. 191-200.
- ❖ Kumar, Pawan; Dwari, Santanu; Saini, Rohit Kumar; Mandal, Mrinal Kanti, "Dual-band dual-sense polarization reconfigurable circularly polarized antenna", *IEEE Antennas and Wireless Propagation Letters*, (18:1), 2019, pp.64-68.
- ❖ Kumar, Pramod; Kumar, Jitendra; Singh, Shailendra; Utkarsh; Dwari, Santanu, "SIW resonator fed horn mounted compact DRA with enhanced gain for multiband applications", *International Journal of Microwave and Wireless Technologies*, (11:8), 2019, pp. 821-828.
- ❖ Kumar, Pramod; Kumar, Jitendra; Utkarsh; Singh, Shailendra; Dwari, Santanu, "Design and investigation of dual band CDRA excited by conformal feed for broadband wireless applications", *Wireless Personal Communications*, (106:3), 2019, pp. 1531-1546.
- ❖ Kumar, Pramod; Singh, Lalit Kumar; Kumar, Chiranjeev, "Software reliability analysis for safety-critical and control systems", *Quality and Reliability Engineering International*, (36:1), 2020, pp. 340-353.
- ❖ Kumar, Pramod; Singh, Lalit Kumar; Kumar, Chiranjeev, "An optimized technique for reliability analysis of safety-critical systems: a case study of nuclear power plant", *Quality and Reliability Engineering International*, (35:1), 2019, pp. 461-469.
- ❖ Kumar, Pranaw; Kumar, Vikash; Roy, Jibendu Sekhar, "Design of quad core photonic crystal fibers with flattened zero dispersion", *AEU-International Journal of Electronics and Communications*, (98), 2019, pp. 265-272.
- ❖ Kumar, Pratim; Varshney, Mayank; Manash, Aniket, "Combustion performance studies of aluminum and boron based composite solid propellants in sub-atmospheric pressure regimes", *Propulsion and Power Research*, (8:4), 2019, pp. 329-338.
- ❖ Kumar, Praveen; Pandey, Neeta; Paul, Sajal K., "Realization of resistorless and electronically tunable inverse filters using VDTA", *Journal of Circuits Systems and Computers*, (28:9), 2019.
- ❖ Kumar, Praveen; Srivastava, Vimal Chandra; Stangar, Urska Lavrencic; Music, Branka; Mishra, Indra Mani; Meng, Yuezhong, "Recent progress in dimethyl carbonate synthesis using different feedstock and techniques in the presence of heterogeneous catalysts", *Catalysis Reviews-Science and Engineering*, 2019.
- ❖ Kumar, Pravir; Mallicka, Ashis; Kujur, Milli Suchita; Tun, Khin Sandar; Gupta, Manoj, "Effects of graphene nanoplatelets on the tribological, mechanical, and thermal properties of Mg-3Al alloy nanocomposites", *International Journal of Materials Research*, (110:6), 2019, pp. 534-542.
- ❖ Kumar, Pulkit; Chattopadhyay, Amares; Mahanty, Moumita; Singh, Abhishek Kumar, "Stresses induced by a moving load in a composite structure with an incompressible poroviscoelastic layer", *Journal of Engineering Mechanics*, (145:9), 2019.
- ❖ Kumar, Pulkit; Chattopadhyay, Amares; Mahanty, Moumita; Singh, Abhishek Kumar, "Analysis on propagation characteristics of the shear wave in a triple

- layered concentric infinite long cylindrical structure: an analytical approach", *European Physical Journal Plus*, (134:1), 2019.
- ❖ Kumar, Pulkit; Mahanty, Moumita; Chattopadhyay, Amares; Singh, Abhishek Kumar, "Effect of interfacial imperfection on shear wave propagation in a piezoelectric composite structure: Wentzel-Kramers-Brillouin asymptotic approach", *Journal of Intelligent Material Systems and Structures*, (30), 2019, pp.2 789-2807.
 - ❖ Kumar, R.; Seth, G. S.; Bhattacharyya, A., "Entropy generation of von Karman's radiative flow with Al₂O₃ and Cu nanoparticles between two coaxial rotating disks: a finite-element analysis", *European Physical Journal Plus*, (134:12), 2019.
 - ❖ Kumar, Rahul; Azam, Mohammad Sikandar; Ghosh, Subrata Kumar, "Influence of stochastic roughness on performance of a Rayleigh step bearing operating under Thermo-elastohydrodynamic lubrication considering shear flow factor", *Tribology International*, (134), 2019, pp. 264-280.
 - ❖ Kumar, Rahul; Azam, Mohammad Sikandar; Ghosh, Subrata Kumar; Khan, Hasim, "Thermo-elastohydrodynamic lubrication simulation of the rayleigh step bearing using the progressive mesh densification method", *Simulation-Transactions of the Society for Modeling and Simulation International*, (95:5), 2019, pp. 395-410.
 - ❖ Kumar, Rahul; Azam, Mohammad Sikandar; Ghosh, Subrata Kumar; Khan, Hasim, "Performance evaluation of rough thrust pad bearing under thermo-elastohydrodynamic lubrication using an improved iterative method", *Mechanics & Industry*, (20:1), 2019.
 - ❖ Kumar, Rahul; Das, Sukanta; Bhaumik, Adrish, "Speed sensorless model predictive current control of doubly-fed induction machine drive using model reference adaptive system", *ISA Transactions*, (86), 2019, pp. 215-226.
 - ❖ Kumar, Rajeev; Chattopadhyaya, Somnath; Agrawal, B. P.; Kumar, Sanjeev; Devkumaran, K.; Arvindan, S., "Effects of types of GTAW including superior GTAW-PC with superimposed HF current on mechanical and metallurgical properties of super duplex stainless steel weld joints", *Materials Research Express*, (6:7), 2019.
 - ❖ Kumar, Rajesh; Dey, Tanish; Panda, Sarat K., "Instability and vibration analyses of FG cylindrical panels under parabolic axial compressions", *Steel and Composite Structures*, (31:2), 2019, pp. 187-199.
 - ❖ Kumar, Rajesh; Kanaujia, Binod Kumar; Dwari, Santanu; Kumar, Sandeep; Song, Hanjung, "An integrated cascode DE power amplifier for RF calibration system towards measurement of bio-sensor applications", *Microwave and Optical Technology Letters*, (61:1), 2019, pp. 31-36.
 - ❖ Kumar, Rajesh; Sahoo, Sumanta; Joanni, Ednan; Singh, Rajesh Kumar; Tan, Wai Kian; Kar, Kamal Krishna; Matsuda, Atsunori, "Recent progress in the synthesis of graphene and derived materials for next generation electrodes of high performance lithium ion batteries", *Progress in Energy and Combustion Science*, (75), 2019.
 - ❖ Kumar, Rajesh; Sahoo, Sumanta; Joanni, Ednan; Singh, Rajesh Kumar; Yadav, Ram Manohar; Verma, Rajiv Kumar; Pratap Singh, Dinesh; Tan, Wai Kian; Perez del Pino, Angel; Moshkalev, Stanislav A.; Matsuda, Atsunori, "A review on synthesis of graphene, h-BN and MoS₂ for energy storage applications: recent progress and perspectives", *Nano Research*, (2:11), 2019, pp. 2655-2694.
 - ❖ Kumar, Rajkishor; Chaudhary, Raghvendra Kumar, "Compact asymmetric cross-shaped rectangular dielectric resonator antenna for wideband circular polarization", *Microwave and Optical Technology Letters*, (61:7), 2019, pp. 1863-1873.
 - ❖ Kumar, Rajkishor; Chaudhary, Raghvendra Kumar, "Stacked rectangular dielectric resonator antenna with different volumes

- for wideband circular polarization coupled with step-shaped conformal strip", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:6), 2019.
- ❖ Kumar, Rajkishor; Chaudhary, Raghvendra Kumar, "A new bidirectional wideband circularly polarized cylindrical dielectric resonator antenna using modified J-shaped ground plane for WiMAX/LTE applications", *Radioengineering*, (28:2), 2019, pp. 391-398.
 - ❖ Kumar, Rajkishor; Chaudhary, Raghvendra Kumar, "A dual-band dual-polarized cubical DRA coupled with new modified cross-shaped slot for ISM (2.4 GHz) and Wi-MAX (3.3-3.6 GHz) band applications", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:1), 2019.
 - ❖ Kumar, Rajkishor; Nasimuddin, N.; Chaudhary, Raghvendra Kumar, "A new dual C-shaped rectangular dielectric resonator based antenna for wideband circularly polarized radiation", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:6), 2019.
 - ❖ Kumar, Rajkishor; Nasimuddin; Chaudhary, Raghvendra Kumar, "Wideband circularly polarized hybrid dielectric resonator antenna with bi-directional radiation characteristics for various wireless applications", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:9), 2019.
 - ❖ Kumar, Rajkishor; Thummaluru, Sreenath Reddy; Chaudhary, Raghvendra Kumar, "Improvements in Wi-MAX reception: a new dual-mode wideband circularly polarized dielectric resonator antenna", *IEEE Antennas and Propagation Magazine*, (61:1), 2019, pp. 41-49.
 - ❖ Kumar, Rakesh; Kumaraswamidhas, L. A.; Murthy, V. M. S. R.; Vettivel, S. C., "Experimental investigations on machine vibration in blast-hole drills and optimization of operating parameters", *Measurement*, (145), 2019, pp. 803-819.
 - ❖ Kumar, Ramesh; Amgoth, Tarachand, "Adaptive cluster-based relay-node placement for disjoint wireless sensor networks", *Wireless Networks*, (26:1), 2020, pp. 651-666.
 - ❖ Kumar, Rawesh; Shah, Sneha; Das, Prangya Paramita; Bhabavanbhai, Gami Girishkumar; Al Fatesh, Ahmed; Chowdhury, Biswajit, "An overview of caprolactam synthesis", *Catalysis Reviews-Science and Engineering*, (61:4), 2019, pp. 516-594.
 - ❖ Kumar, Ritesh; Bhanodai, Guggilla; Pamula, Rajendra, "Book search using social information, user profiles and query expansion with pseudo relevance feedback", *Applied Intelligence*, (49:6), 2019, pp. 2178-2200.
 - ❖ Kumar, Ritesh; Raghuwanshi, Sanjeev Kumar, "Simultaneous photonic generation of multiple chirp and unchirp microwave waveform with frequency multiplying capability for optical beam forming system", *Optical and Quantum Electronics*, (51:11), 2019.
 - ❖ Kumar, Sachin; Rawat, Gautam; Dhamodharan, S.; Sen, Koushik; Maiti, Saumen, "Dimensionality analysis of MT impedances of Tso-Moran dome: implication for structural interpretation", *Himalayan Geology*, (40:2), 2019, pp. 190-198.
 - ❖ Kumar, Samarjeet; Mandal, Swaroop Kumar; Singh, Purushottam Kumar; Mishra, Santosh Kumar; Das, Alok Kumar, "Performance analysis of a thermoelectric generation system with different flow configurations", *Journal of Electronic Materials*, (48:7), 2019, pp. 4607-4617.
 - ❖ Kumar, Sanjeev; Sarkar, Mithun; Singh, Pawan Kumar; Lee, Poh Seng, "Study of thermal and hydraulic performance of air cooled minichannel heatsink with novel geometries", *International Communications in Heat and Mass Transfer*, (103), 2019, pp. 31-42.
 - ❖ Kumar, Sanjeev; Singh, Pawan Kumar, "A novel approach to manage temperature

- non-uniformity in minichannel heat sink by using intentional flow maldistribution", *Applied Thermal Engineering*, (163), 2019.
- ❖ Kumar, Sanjeev; Singh, Pawan Kumar, "Effects of flow inlet angle on flow maldistribution and thermal performance of water cooled mini-channel heat sink", *International Journal of Thermal Sciences*, (138), 2019, pp. 504-511.
 - ❖ Kumar, Santosh; Ghosh, Subrata Kumar, "Particle emission of organic brake pad material: a review", *Proceedings of the Institution of Mechanical Engineers Part D-Journal of Automobile Engineering*, (234:5), 2020, pp. 1213-1223.
 - ❖ Kumar, Shiv; Singh, Abhay Kumar; Kar, Samarjit, "A deteriorating inventory model with price dependent consumption rate and exponentially declining partial backlogging", *Proceedings of the National Academy of Sciences India Section A-Physical Sciences*, (89:3), 2019, pp. 525-532.
 - ❖ Kumar, Subodh; Jana, Prasun, "Application of dynamic stiffness method for accurate free vibration analysis of sigmoid and exponential functionally graded rectangular plates", *International Journal of Mechanical Sciences*, (163), 2019.
 - ❖ Kumar, Sujit; Dasgupta, K.; Ghoshal, S. K.; Das, J., "Dynamic analysis of a hydro-motor drive system using priority valve", *Proceedings of the Institution of Mechanical Engineers Part E-Journal of Process Mechanical Engineering*, (233:3), 2019, pp. 508-525.
 - ❖ Kumar, Sujit; Dasgupta, Kabir; Ghoshal, Sanjoy K., "Fault diagnosis and prognosis of a hydro-motor drive system using priority valve", *Journal of the Brazilian Society of Mechanical Sciences and Engineering*, (41:2), 2019.
 - ❖ Kumar, Sumit; Dutta, Sekhar Chandra, "An effort towards constructing building structures on backfilled soil", *Journal of Building Engineering*, (26), 2019.
 - ❖ Kumar, Sumit; Kumar, Jitendra; Sharma, Shailesh Narayan; Srivastava, Shubhda, "RGO integrated MEHPPV and P3HT polymer blends for bulk hetero junction solar cells: a comparative insight", *Optik*, (178), 2019, pp. 411-421.
 - ❖ Kumar, Sumit; Sharma, Shailesh Narian; Kumar, Jitendra, "Comparative charge transport study of MEHPPV-TiO₂ and P3HT-TiO₂ nanocomposites for hybrid bulk heterojunction solar cells", *Journal of Nanoscience and Nanotechnology*, (19:6), 2019, pp. 3408-3419.
 - ❖ Kumar, Sunil; Ahmad, Tausif; Shankhwar, Siddharth; Mandal, Ajay, "Evaluation of interfacial properties of aqueous solutions of anionic, cationic and non-ionic surfactants for application in enhanced oil recovery", *Tenside Surfactants Detergents*, (56:2), 2019, pp. 138-149.
 - ❖ Kumar, Suresh; Singh, Rambabu; Venkatesh, A. S.; Udayabhanu, G.; Sahoo, P. R., "Medical geological assessment of fluoride contaminated groundwater in parts of Indo-Gangetic alluvial plains", *Scientific Reports*, (9), 2019.
 - ❖ Kumar, Susheel; Mendhe, Vinod Atmaram; Kamble, Alka Damodhar; Varma, Atul Kumar; Mishra, Divya Kumari; Bannerjee, Mollika; Buragohain, John; Prasad, Amal Kishore, "Geochemical attributes, pore structures and fractal characteristics of Barakar shale deposits of Mand-Raigarh basin, India", *Marine and Petroleum Geology*, (103), 2019, pp. 377-396.
 - ❖ Kumar, Tanuj; Mandal, Upain Kumar, "Wavelet transform associated with linear canonical Hankel transform", *Mathematical Methods in the Applied Sciences*, (42:9), 2019, pp. 3167-3178.
 - ❖ Kumar, Ujjawal; Narayan, Satya; Pal, S. K., "New insights on structure and tectonics over the laxmi ridge using EIGEN6C4 modelled gravity data", *Indian Journal of Geo-Marine Sciences*, (48:12), 2019, pp. 1999-2010.
 - ❖ Kumar, Upendra; Yadav, Dharmendra; Thakur, Anukul K.; Srivastav, Kamal K.; Upadhyay, Shail, "Investigation on phase formation of Sr₂SnO₄ and effect of La-doping on its structural and optical

- properties", *Journal of Thermal Analysis and Calorimetry*, (135:4), 2019, pp. 1987-1999.
- ❖ Kumar, V; Santosh, R., "First-principle calculations of structural, electronic, optical and thermodynamical properties of fluorinated graphene", *Materials Science and Engineering B-Advanced Functional Solid-State Materials*, (246), 2019, pp. 127-135.
 - ❖ Kumar, Vikash; Jha, Kailash, "Multi-objective shape optimization of vortex finders in cyclone separators using response surface methodology and genetic algorithms", *Separation and Purification Technology*, (215), 2019, pp. 25-31.
 - ❖ Kumar, Yatendra; Gangwar, Ravi Kumar; Kanaujia, Binod Kumar, "Asymmetrical mirror imaged monopole antenna with modified ground structure for DBDP radiations", *International Journal of Electronics*, (107:4), 2020, pp. 596-612.
 - ❖ Kumari, Ajita; Gajbhiye, Pratima; Rayasam, Venugopal, "Comparative evaluation of natural and synthetic flocculants on selective metal recovery from low-grade iron ore limes", *Transactions of the Indian Institute of Metals*, (72:10), 2019, pp. 2567-2579.
 - ❖ Kumari, Alka; Kundu, Santimoy; Gupta, Shishir, "Propagation and attenuation characteristics of Rayleigh waves induced due to irregular surface in liquid-saturated micropolar porous half-space", *European Physical Journal Plus*, (134:11), 2019.
 - ❖ Kumari, Amrita; Kumar, Subindu; Sharma, Tarun Kumar; Das, Mukul K., "On the C-V characteristics of nanoscale strained gate-all-around Si/SiGe MOSFETs", *Solid-State Electronics*, (154), 2019, pp. 36-42.
 - ❖ Kumari, Anita; Mukhopadhyay, Lakshmi; Rai, Vineet Kumar, "Energy transfer and dipole-dipole interaction in $\text{Er}^{3+}/\text{Eu}^{3+}/\text{Yb}^{3+}:\text{Gd}-2(\text{MoO}_4)_3$ upconverting nanophosphors", *New Journal of Chemistry*, (43:16), 2019, pp. 6249-6256.
 - ❖ Kumari, Anita; Mukhopadhyay, Lakshmi; Rai, Vineet Kumar, " $\text{Er}^{3+}/\text{Yb}^{3+}/\text{Li}^{+}/\text{Zn}^{2+}:\text{Gd}-2(\text{MoO}_4)_3$ upconverting nanophosphors in optical thermometry", *Journal of Rare Earths*, (37:3), 2019, pp. 242-247.
 - ❖ Kumari, Archana; Jha, Manis Kumar; Pathak, Devendra Deo; Chakravarty, Sanchita; Lee, Jae-chun, "Processes developed for the separation of europium (Eu) from various resources", *Separation and Purification Reviews*, (48:2), 2019, pp. 91-121.
 - ❖ Kumari, Archana; Jha, Manis Kumar; Yoo, Kyoungkeun; Panda, Rekha; Lee, Jin Young; Kumar, J. Rajesh; Pathak, Devendra Deo, "Advanced process to dephosphorize monazite for effective leaching of rare earth metals (REMs)", *Hydrometallurgy*, (187), 2019, pp. 203-211.
 - ❖ Kumari, Archana; Panda, Rekha; Lee, Jin Young; Thriveni, Thenepalli; Jha, Manis Kumar; Pathak, Devendra Deo, "Extraction of rare earth metals (REMs) from chloride medium by organo-metallic complexation using D2EHPA", *Separation and Purification Technology*, (227), 2019.
 - ❖ Kumari, Archana; Parween, Rukshana; Chakravarty, Sanchita; Parmar, Kavita; Pathak, Devendra Deo; Lee, Jae-chun; Jha, Manis Kumar, "Novel approach to recover rare earth metals (REMs) from Indian coal bottom ash", *Hydrometallurgy*, (187), 2019, pp. 1-7.
 - ❖ Kumari, Bhawana; Sahoo, Manodipan, "Stability analysis of multilayer vertical graphene nanoribbon interconnects", *Materials Research Express*, (6:8), 2019.
 - ❖ Kumari, Bhawana; Sahoo, Manodipan, "Performance and power optimization for intercalation doped multilayer graphene nanoribbon interconnects", *IETE Journal of Research*, 2019.
 - ❖ Kumari, Juli; Paul, Biswajit, "Spatiotemporal variation in primary nutrients amassing in peninsular river sediment: India", *Environmental Earth Sciences*, (78:10), 2019.

- ❖ Kumari, Lakshmi; Kar, Asit Kumar, "Morphology evolution and luminescence enhancement in hydrothermally synthesized Ag doped ZnO nanorods", *Materials Research Express*, (6:9), 2019.
- ❖ Kumari, Manisha; Mondal, Shrabani; Sharma, Prashant K., "Synthesis, characterization and electrochemical monitoring of drug release properties of dual stimuli responsive mesoporous GdPO₄:Eu³⁺ nanoparticles", *Journal of Alloys and Compounds*, (776), 2019, pp. 654-665.
- ❖ Kumari, Minashree; Gupta, Sunil Kumar, "Response surface methodological (RSM) approach for optimizing the removal of trihalomethanes (THMs) and its precursor's by surfactant modified magnetic nanoadsorbents (sMNP) - an endeavor to diminish probable cancer risk", *Scientific Reports*, (9), 2019.
- ❖ Kumari, Nisha; Rana, Anu; Jagadevan, Sheeja, "Arsenite biotransformation by *Rhodococcus* sp.: characterization, optimization using response surface methodology and mechanistic studies", *Science of the Total Environment*, (687), 2019, pp. 577-589.
- ❖ Kumari, Preeti; Maiti, Subodh Kumar, "Bioaccessibilities and health risk assessment of heavy and trace elements in fish from an urban city, India", *Human and Ecological Risk Assessment*, 2019.
- ❖ Kumari, Preeti; Maiti, Subodh Kumar, "Health risk assessment of lead, mercury, and other metal(loid)s: a potential threat to the population consuming fish inhabiting, a lentic ecosystem in steel city (Jamshedpur), India", *Human and Ecological Risk Assessment*, (25:8), 2019, pp. 2174-2192.
- ❖ Kumari, Priti; Kewat, Pramod Kumar, "2-Adic and linear complexities of a class of Whiteman's generalized cyclotomic sequences of order four", *International Journal of Foundations of Computer Science*, (30:5), 2019, pp. 759-779.
- ❖ Kumari, Reena; Gangwar, Ravi Kumar, "Wideband circularly polarized square dielectric resonator antenna for WLAN /WiMAX applications", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:2), 2019.
- ❖ Kumari, Rinki; Pal, Kunal; Karmakar, Parimal; Sahu, Sumanta Kumar, "pH-responsive Mn-doped carbon dots for white-light-emitting diodes, fingerprinting, and bioimaging", *ACS Applied Nano Materials*, (2:9), 2019, pp. 5900-5909.
- ❖ Kumari, S.; Nirala, A. K., "Biospeckle image processing algorithms for non-destructive differentiation between maturity and ripe stages of Indian climacteric fruits and evaluation of their ripening period", *Laser Physics*, (29:7), 2019.
- ❖ Kumari, S.; Tyagi, M.; Jagadevan, S., "Mechanistic removal of environmental contaminants using biogenic nanomaterials", *International Journal of Environmental Science and Technology*, (16:11), 2019, pp. 7591-7606.
- ❖ Kumari, Sandhya; Shankar, Gauri, "Maiden application of cascade tilt-integral-tilt-derivative controller for performance analysis of load frequency control of interconnected multi-source power system", *IET Generation Transmission & Distribution*, (13:23), 2019, pp. 5326-5338.
- ❖ Kumari, Sangeeta; Singh, Prerna; Upadhyay, Ranjit Kumar, "Virus dynamics of a distributed attack on a targeted network: Effect of firewall and optimal control", *Communications in Nonlinear Science and Numerical Simulation*, (73), 2019, pp. 74-91.
- ❖ Kumari, Shubhashri; Nirala, Anil Kumar, "Monitoring of functional blood flow on human hand due to effect of different treatments by laser biospeckle imaging", *Lasers in Medical Science*, (34:6), 2019, pp. 1167-1176.
- ❖ Kumari, Sneha; Maiti, Subodh Kumar, "Reclamation of coalmine spoils with topsoil, grass, and legume: a case study from India", *Environmental Earth Sciences*, (78:14), 2019.

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- ❖ Kumari, Soni; Jose, Sanoj; Jagadevan, Sheeja, "Optimization of phosphate recovery as struvite from synthetic distillery wastewater using a chemical equilibrium model", *Environmental Science and Pollution Research*, (26:29), 2019, pp. 30452-30462.
- ❖ Kumari, Tripta; Das, Gourab; Gangwar, Ravi K.; Suman, Kundan K., "Dielectric resonator based two-port dual band antenna for MIMO applications", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:12), 2019.
- ❖ Kumari, Tripta; Das, Gourab; Sharma, Anand; Gangwar, Ravi Kumar, "Design approach for dual element hybrid MIMO antenna arrangement for wideband applications", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:1), 2019.
- ❖ Kumhar, Raju; Kundu, Santimoy; Maity, Manisha; Gupta, Shishir, "Mechanical waves study in tri-materials bars having sinusoidally interfaces (i.e. fiber-reinforced, poroelastic and isotropic)", *Materials Research Express*, (6:12), 2019.
- ❖ Kundu, Bhaskar; Vissa, Naresh Krishna; Gahalaut, Kalpna; Gahalaut, Vineet Kumar; Panda, Dibyashakti; Malik, Kapil, "Influence of anthropogenic groundwater pumping on the 2017 November 12 M7.3 Iran-Iraq border earthquake", *Geophysical Journal International*, (218:2), 2019, pp. 833-839.
- ❖ Kundu, Pallabi; Mishra, Pankaj; Jaiswal, Anubha; Ram, Jokhan, "Structures and phase transition in a two-dimensional system of Gay-Berne molecules", *Journal of Molecular Liquids*, (296), 2019.
- ❖ Kundu, Partha; Arora, Kunal; Gu, Yongan; Kumar, Vimal; Mishra, Indra M., "Formation and stability of water-in-oil nano-emulsions with mixed surfactant using in-situ combined condensation-dispersion method", *Canadian Journal of Chemical Engineering*, (97:7), 2019, pp. 2039-2049.
- ❖ Kundu, Partha; Kumar, Vimal; Mishra, Indra M., "Experimental study on flow and rheological behavior of oil-in-water emulsions in unconsolidated porous media: effect of particle size and phase volume fractions", *Powder Technology*, (343), 2019, pp. 821-833.
- ❖ Kundu, Partha; Kumar, Vimal; Scales, Peter J.; Mishra, Indra Mani, "Synergistic influence of pH and temperature on rheological behavior of adhesive emulsions stabilized with Micelle dispersion of an anionic surfactant", *Journal of Surfactants and Detergents*, (22:2), 2019, pp. 301-313.
- ❖ Kundu, Piyali; Jana, Nabakumar; Kumar, Somesh; Chatterjee, Kashinath, "Stress-strength reliability estimation for exponentially distributed system with common minimum guarantee time", *Communications in Statistics-theory and Methods*, (49:14), 2020, pp. 3375-3396.
- ❖ Kundu, Santimoy; Alam, Parvez; Gupta, Shishir, "Shear waves in magneto-elastic transversely isotropic (MTI) layer bonded between two heterogeneous elastic media", *Mechanics of Advanced Materials and Structures*, (26:5), 2019, pp. 407-415.
- ❖ Kundu, Santimoy; Maity, Manisha; Pandit, Deepak Kr.; Gupta, Shishir, "Effect of initial stress on the propagation and attenuation characteristics of Rayleigh waves", *Acta Mechanica*, (230:1), 2019, pp. 67-85.
- ❖ Kundua, Partha; Mishra, Indra M., "Treatment and reclamation of hydrocarbon-bearing oily wastewater as a hazardous pollutant by different processes and technologies: a state-of-the-art review", *Reviews in Chemical Engineering*, (35:1), 2019, pp. 73-108.
- ❖ Kunti, A. K.; Ghosh, L.; Sharma, S. K.; Swart, H. C., "Synthesis and luminescence mechanism of white light emitting Eu³⁺ doped CaZnV₂O₇ phosphors", *Journal of Luminescence*, (214), 2019.
- ❖ Kunti, Arup K.; Patra, Nirmalendu; Harris, Richard A.; Sharma, Shailendra K.; Bhattacharyya, Dibyendu; Jha, Sambhu N.; Swart, Hendrik C., "Local structure and spectroscopic properties of Eu³⁺-Doped

- BaZrO₃", *Inorganic Chemistry*, (58:5), 2019, pp. 3073-3089.
- ❖ Kunti, Arup Kumar; Sharma, Shailendra Kumar; Choudhary, Ram Janay; Swart, Hendrik Christoffel, "Structural and luminescence properties of laser assisted Eu³⁺ doped BaZrO₃ thin films", *Journal of Alloys and Compounds*, (801), 2019, pp. 99-111.
 - ❖ Kushwaha, Bishwajit Kumar; Singh, Samiksha; Tripathi, Durgesh Kumar; Sharma, Shivesh; Prasad, Sheo Mohan; Chauhan, Devendra Kumar; Kumar, Vipin; Singh, Vijay Pratap, "New adventitious root formation and primary root biomass accumulation are regulated by nitric oxide and reactive oxygen species in rice seedlings under arsenate stress", *Journal of Hazardous Materials*, (361), 2019, pp. 134-140.
 - ❖ Kushwaha, Prabhakar; Ghoshal, Sanjoy K.; Dasgupta, Kabir, "Dynamic analysis of a hydraulic motor drive with variable inertia flywheel", *Proceedings of the Institution of Mechanical Engineers Part I-Journal of Systems and Control Engineering*, (234:6), 2020, pp. 734-747.
 - ❖ Kushwaha, Prabhakar; Ghoshal, Sanjoy K.; Dasgupta, Kabir, "Model-based performance analysis of a hybrid summation drive used in off-highway vehicles", *Arabian Journal for Science and Engineering*, (44:2), 2019, pp. 857-872.
 - ❖ Laha, Dipranjan; Pal, Kunal; Chowdhuri, Angshuman Ray; Parida, Pravat Kumar; Sahu, Sumanta Kumar; Jana, Kuladip; Karmakar, Parimal, "Fabrication of curcumin-loaded folic acid-tagged metal organic framework for triple negative breast cancer therapy in in vitro and in vivo systems", *New Journal of Chemistry*, (43:1), 2019, pp. 217-229.
 - ❖ Lata, Anamika; Mandal, Nirupama, "Investigation of influence of area of electrodes on the characteristics of electrode polarization-based flow sensor", *IEEE Sensors Journal*, (19:19), 2019, pp. 8781-8789.
 - ❖ Lata, Anamika; Mandal, Nirupama, "Investigation of the effect of electrodes distance on the polarization impedance type flowmeter", *IEEE Sensors Journal*, (19:15), 2019, pp. 6279-6288.
 - ❖ Lata, Anamika; Mandal, Nirupama, "Design of flow transmitter using a capacitive type sensor", *IETE Journal of Research*, 2019.
 - ❖ Lata, Sneha; Prabhakar, Roshan; Adak, Asok; Samadder, Sukha Ranjan, "As(V) removal using biochar produced from an agricultural waste and prediction of removal efficiency using multiple regression analysis", *Environmental Science and Pollution Research*, (26:31), 2019, pp. 32175-32188.
 - ❖ Layek, Samaresh; Agrahari, Bhumiika; Dey, Shuvankar; Ganguly, Rakesh; Pathak, Devendra D., "Copper(II)-facilitated synthesis of substituted thioethers and 5-substituted 1H-tetrazoles: experimental and theoretical studies", *Journal of Organometallic Chemistry*, (896), 2019, pp. 194-206.
 - ❖ Lim, Ping Feng; Leong, Kah Hon; Sim, Lan Ching; Abd Aziz, Azrina; Saravanan, Pichiah, "Amalgamation of N-graphene quantum dots with nanocubic like TiO₂: an insight study of sunlight sensitive photocatalysis", *Environmental Science and Pollution Research*, (26:4), 2019, pp. 3455-3464.
 - ❖ Lin, Chih-Hao; Kang, Chieh-Yu; Verma, Akta; Wu, Tingzhu; Pai, Yung-Min; Chen, Tzu-Yu; Tsai, Chun-Lin; Yang, Ya-Zhu; Sharma, S. K.; Sher, Chin-Wei; Chen, Zhong; Lee, Po-Tsung; Chung, Shu-Ru; Kuo, Hao-Chung, "Ultrawide color gamut perovskite and CdSe/ZnS quantum-dots-based white light-emitting diode with high luminous efficiency", *Nanomaterials*, (9:9), 2019.
 - ❖ Lin, Chih-Hao; Verma, Akta; Kang, Chieh-Yu; Pai, Yung-Min; Chen, Tzu-Yu; Yang, Jin-Jia; Sher, Chin-Wei; Yang, Ya-Zhu; Lee, Po-Tsung; Lin, Chien-Chung; Wu, Yu-Chuan; Sharma, S. K.; Wu, Tingzhu; Chung, Shu-Ru; Kuo, Hao-Chung, "Hybrid-type white LEDs based on

- inorganic halide perovskite QDs: candidates for wide color gamut display backlights", *Photonics Research*, (7:5), 2019, pp. 579-585.
- ❖ Lyubimov, S. E.; Sokolovskaya, M. V.; Chowdhury, B.; Arzumanyan, A. V.; Tukhvatshin, R. S.; Ibragimova, L. F.; Tyutyunov, A. A.; Davankov, V. A.; Muzafarov, A. M., "Silica gel modified with tetraalkylammonium halides as an available and efficient catalyst for the synthesis of cyclic organic carbonates from epoxides and CO₂", *Russian Chemical Bulletin*, (68:10), 2019, pp. 1866-1868.
 - ❖ Madane, Pravin A.; Bhowmik, Subrata; Panua, Rajsekhar, "Hybrid taguchi-fuzzy-based performance-exhaust emission trade-off study of variable compression ratio diesel engine fueled with undi-diesel blends", *Environmental Progress & Sustainable Energy*, (39:2), 2020.
 - ❖ Maharana, Bhabani Supriya; Suresh, Nikkam, "Separation characteristics of 100-mm dual-cone water-only cyclone to wash high NGM coal", *International Journal of Coal Preparation and Utilization*, (40:1), 2020, pp. 37-50.
 - ❖ Mahato, Bidyut; Jana, K. C.; Thakura, P. R., "Constant V/f control and frequency control of isolated winding induction motor using nine-level three-phase inverter", *Iranian Journal of Science and Technology-Transactions of Electrical Engineering*, (43:1), 2019, pp. 123-135.
 - ❖ Mahato, Bidyut; Majumdar, Saikat; Jana, Kartick Chandra, "A new and generalized structure of single-phase and three-phase cascaded multilevel inverter with reduced power components", *International Transactions on Electrical Energy Systems*, (30:2), 2020.
 - ❖ Mahato, Bidyut; Majumdar, Saikat; Jana, Kartick Chandra, "Reduction in controlled power switches for a single-phase novel multilevel inverter", *International Journal of Electronics*, (106:8), 2019, pp. 1200-1215.
 - ❖ Mahato, Bidyut; Majumdar, Saikat; Jana, Kartick Chandra, "Single-phase modified T-type-based multilevel inverter with reduced number of power electronic devices ", *International Transactions on Electrical Energy Systems*, (29:11), 2019.
 - ❖ Maiti, Deblina; Ansari, Iqbal; Rather, Mohd Ashraf; Deepa, Arukula, "Comprehensive review on wastewater discharged from the coal-related industries - characteristics and treatment strategies", *Water Science and Technology*, (79:11), 2019, pp. 2023-2035.
 - ❖ Maiti, Moumita; Ranjan, Ravi; Chaturvedi, Ekta; Bhaumik, Ajoy Kumar; Mandal, Ajay, "Formulation and characterization of water-based drilling fluids for gas hydrate reservoirs with efficient inhibition properties", *Journal of Dispersion Science and Technology*, 2019.
 - ❖ Maity, Chandan Kumar; Hatui, Goutam; Sahoo, Sumanta; Saren, Pupalata; Nayak, Ganesh Chandra, "Boron nitride based ternary nanocomposites with different carbonaceous materials decorated by polyaniline for supercapacitor application", *Chemistryselect*, (4:13), 2019, pp. 3672-3680.
 - ❖ Maity, Chandan Kumar; Hatui, Goutam; Tiwari, Santosh Kumar; Udayabhanu, G.; Pathak, D. D.; Nayak, Ganesh Chandra; Verma, Kartikey, "One pot solvothermal synthesis of novel solid state N-doped TiO₂/n-Gr for efficient energy storage devices", *Vacuum*, (164), 2019, pp. 88-97.
 - ❖ Majee, Karunamay; Padhi, Sumanta Kumar, "Ligand dechelation effect on a [Co(tpy)(2)](2+) scaffold towards electro-catalytic proton and water reduction", *New Journal of Chemistry*, (43:9), 2019, pp. 3856-3865.
 - ❖ Majeed, M.; Khan, H. M.; Rasheed, I, "Finite element analysis of melt pool thermal characteristics with passing laser in SLM process", *Optik*, (194), 2019.
 - ❖ Majhi, Kartick Chandra; Karfa, Paramita; Madhuri, Rashmi, "Bimetallic transition metal chalcogenide nanowire array: an effective catalyst for overall water splitting", *Electrochimica Acta*, (318), 2019, pp. 901-912.

- ❖ Maji, Reba; Singh, G. N.; Bandyopadhyay, Arnab, "Estimation of population mean in presence of random non response in two-stage cluster sampling", *Communications in Statistics-Theory and Methods*, (48:14), 2019, pp. 3586-3608.
- ❖ Majumdar, Dhruvajyoti; Agrawal, Yashika; Thomas, Renjith; Ullah, Zakir; Santra, Manas K.; Das, Sourav; Pal, Tapan K.; Bankura, Kalipada; Mishra, Dipankar, "Syntheses, characterizations, crystal structures, DFT/TD-DFT, luminescence behaviors and cytotoxic effect of bicompartamental Zn (II)-dicyanamide schiff base coordination polymers: an approach to apoptosis, autophagy and necrosis type classical cell death", *Applied Organometallic Chemistry*, (34:1), 2020.
- ❖ Majumdar, Dhruvajyoti; Das, Dhiraj; Sreejith, S. S.; Das, Sourav; Biswas, Jayanta Kumar; Mondal, Monojit; Ghosh, Debarati; Bankura, Kalipada; Mishra, Dipankar, "Dicyanamide-interlaced assembly of Zn(II)-schiff-base complexes derived from salicylaldimino type compartmental ligands: Syntheses, crystal structures, FMO, ESP, TD-DFT, fluorescence lifetime, in vitro antibacterial and anti-biofilm properties", *Inorganica Chimica Acta*, (489), 2019, pp. 244-254.
- ❖ Majumdar, Dhruvajyoti; Das, Sourav; Thomas, Renjith; Ullah, Zakir; Sreejith, S. S.; Das, Dhiraj; Shukla, Pooja; Bankura, Kalipada; Mishra, Dipankar, "Syntheses, X-ray crystal structures of two new Zn(II)-dicyanamide complexes derived from H(2)vanen-type compartmental ligands: investigation of thermal, photoluminescence, in vitro cytotoxic effect and DFT-TDDFT studies", *Inorganica Chimica Acta*, (492), 2019, pp. 221-234.
- ❖ Majumdar, Dhruvajyoti; Dey, Swapan; Das, Dhiraj; Singh, Dheeraj Kumar; Das, Sourav; Bankura, Kalipada; Mishra, Dipankar, "Heterometallic Zn(II)-K(I) complex with salen-type schiff-base ligand: synthesis, crystal structure, solid-state photoluminescent property and theoretical study", *Journal of Molecular Structure*, (1185), 2019, pp. 112-120.
- ❖ Majumdar, Dhruvajyoti; Dey, Swapan; Sreejith, S. S.; Biswas, Jayanta Kumar; Mondal, Monojit; Shukla, Pooja; Das, Sourav; Pal, Tapan; Das, Dhiraj; Bankura, Kalipada; Mishra, Dipankar, "Syntheses, crystal structures and photo physical aspects of azido-bridged tetranuclear cadmium (II) complexes: DFT/TD-DFT, thermal, antibacterial and anti-biofilm properties", *Journal of Molecular Structure*, (1179), 2019, pp. 694-708.
- ❖ Majumdar, Saikat; Mahato, Bidyut; Jana, Kartick Chandra, "Optimum structure-based multi-level inverter with doubling circuit configuration", *Journal of Circuits Systems and Computers*, (28:11), 2019.
- ❖ Majumdar, Subhashree; Singh, Sahendra; Sahoo, Prabodha Ranjan; Venkatesh, A. S., "Trace-element systematics of pyrite and its implications for refractory gold mineralisation within the carbonaceous metasedimentary units of Palaeoproterozoic south Purulia shear zone, eastern India", *Journal of Earth System Science*, (128:8), 2019.
- ❖ Majumdar, Dhruvajyoti; Das, Dhiraj; Sreejith, S. S.; Nag, Sudip; Dey, Swapan; Mondal, Surajit; Bankura, Kalipada; Mishra, Dipankar, "Synthesis, characterizations and single crystal structure of di-nuclear azido-bridged Cd(II) coordination polymer with Schiff base precursor (H₂LpentOMe): DFT, fluorescence, solvatochromism and in vitro antimicrobial assay", *Inorganica Chimica Acta*, (496), 2019.
- ❖ Majumder, Mandira; Choudhary, Ram B.; Thakur, Anukul K., "Hemispherical nitrogen-doped carbon spheres integrated with polyindole as high performance electrode material for supercapacitor applications", *Carbon*, (142), 2019, pp. 650-661.
- ❖ Malaidurai, M.; Kumar, B. Santosh; Thangavel, R., "Spin polarized carrier injection driven magneto-optical Kerr effect in Cr-doped ZnO nanorods", *Physics Letters A*, (383:24), 2019, pp. 2988-2992.

Research, Development, Innovation & Entrepreneurship

- ❖ Malik, Kapil; Kumar, Dheeraj; Perissin, Daniele, "Assessment of subsidence in Delhi NCR due to groundwater depletion using TerraSAR-X and persistent scatterers interferometry", *Imaging Science Journal*, (67:1), 2019, pp.1-7.
- ❖ Mallick, Ashis; Prasad, Dilip K.; Behera, Pratyush Prasanna, "Stresses in radiative annular fin under thermal loading and its inverse modeling using sine cosine algorithm (SCA)", *Journal of Thermal Stresses*, (42:4), 2019, pp. 401-415.
- ❖ Mallick, Ashis; Ranjan, Rajiv; Prasad, Dilip K., "Inverse estimation of variable thermal parameters in a functionally graded annular fin using dragon fly optimization", *Inverse Problems in Science and Engineering*, (27:7), 2019, pp. 969-986.
- ❖ Mallick, Nirmalya; Mukherjee, Vivekananda, "Interval type 2 fuzzy logic controlled advanced dynamic voltage restorer for voltage sag alleviation", *IET Generation Transmission & Distribution*, (13:14), 2019, pp. 3020-3028.
- ❖ Mandal, Arnab; Deka, Barasha; Mahto, Vikas; Nihalani, M. C.; Purohit, Subodh, "Synthesis, characterization and evaluation of a novel asphaltene inhibitor to control organic solid deposition in petroleum formation", *Petroleum Science and Technology*, (37:7), 2019, pp. 780-786.
- ❖ Mandal, Arnab; Mahto, Vikas; Purohit, Subodh; Nihalani, M. C., "Evaluation of synthesized polymeric additives as paraffin inhibitors for wax dissolution in the petroleum reservoir rock", *Journal of Petroleum Science and Engineering*, (177), 2019, pp. 250-260.
- ❖ Mandal, Biplab Kumar; Mishra, Pankaj, "Pair correlation function and freezing transitions in a two-dimensional system of model ultrasoft colloids", *Molecular Physics*, 2019.
- ❖ Mandal, Gobind; Choudhary, R. B., "rGO-Y2O3 intercalated PANI matrix (PANI-rGO-Y2O3) based polymeric nanohybrid material as electron transport layer for OLED application", *Research on Chemical Intermediates*, (45:7), 2019, pp. 3755-3775.
- ❖ Mandal, Goutam; Kumar, Anil; Mandal, Sanjoy; Sharma, D. C.; Kumar, Manoj, "Volume measurement of large volumetric vessel using tap water", *Mapan-Journal of Metrology Society of India*, (34:4), 2019, pp. 487-493.
- ❖ Mandal, Nirupama; Mondal, Bikas; Sarkar, Rajan, "Design of an optical temperature transmitter for inflammable industry", *IET Science Measurement & Technology*, (13:5), 2019, pp. 671-677.
- ❖ Mandal, Swaroop Kumar; Kumar, Samarjeet; Singh, Purushottam Kumar; Mishra, Santosh Kr; Bishwakarma, Harish; Choudhry, Naresh P.; Nayak, Rajen Kumar; Das, Alok Kumar, "Performance investigation of CuO-paraffin wax nanocomposite in solar water heater during night", *Thermochimica Acta*, (671), 2019, pp. 36-42.
- ❖ Manisha; Kaligatla, R. B.; Sahoo, T., "Effect of bottom undulation for mitigating wave-induced forces on a floating bridge", *Wave Motion*, (89), 2019, pp. 166-184.
- ❖ Manjhi, Sanjeev Kumar; Kumar, Rakesh, "Performance assessment of K-type, E-type and J-type coaxial thermocouples on the solar light beam for short duration transient measurements", *Measurement*, (146), 2019, pp. 343-355.
- ❖ Manjhi, Sanjeev Kumar; Kumar, Rakesh, "Surface heat flux measurements for short time-period on combustion chamber with different types of coaxial thermocouples", *Experimental Heat Transfer*, (33:3), 2020, pp. 282-303.
- ❖ Manjhi, Sanjeev Kumar; Kumar, Rakesh, "Transient surface heat flux measurement for short duration using K-type, E-type and J-type of coaxial thermocouples for internal combustion engine", *Measurement*, (136), 2019, pp. 256-268.
- ❖ Manjhi, Sanjeev Kumar; Kumar, Rakesh, "Transient heat flux measurement analysis from coaxial thermocouples at convective based step heat load", *Numerical Heat Transfer Part A-Applications*, (75:3), 2019, pp. 200-216.

- ❖ Manna, S.; Ghosh, S. K.; Haldar, S. C., "Optimum fin parameters of radial heat sinks subjected to natural convection", *Journal of Thermal Science and Engineering Applications*, (11:5), 2019.
- ❖ Mantry, Snigdha Paramita; Sarun, P. M., "Investigation on the impedance spectroscopy and electrical conduction mechanism in SrTi_{1-x}VxO₃ (x=0.00x0.15) ceramics", *Journal of Materials Science-Materials in Electronics*, (30:7), 2019, pp. 6795-6805.
- ❖ Mathur, Rohit; Dwari, Santanu, "8-port multibeam planar UWB-MIMO antenna with pattern and polarisation diversity", *IET Microwaves Antennas & Propagation*, (13:13), 2019, pp. 2297-2302.
- ❖ Mathur, Rohit; Dwari, Santanu, "Compact planar reconfigurable UWB-MIMO antenna with on-demand worldwide interoperability for microwave access/wireless local area network rejection", *IET Microwaves Antennas & Propagation*, (13:10), 2019, pp. 1684-1689.
- ❖ Mathur, Rohit; Dwari, Santanu, "A compact UWB-MIMO with dual grounded CRR for isolation improvement", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:1), 2019.
- ❖ Maurya, Abhishek; Kesharwani, Neha; Kachhap, Payal; Mishra, Vivek Kumar; Chaudhary, Nikita; Haldar, Chanchal, "Polymer-anchored mononuclear and binuclear Cu-II schiff-base complexes: impact of heterogenization on liquid phase catalytic oxidation of a series of alkenes", *Applied Organometallic Chemistry*, (33:9), 2019.
- ❖ Maurya, Manish; Kumar, Sudhir; Bajpai, Vivek, "Assessment of the mechanical properties of aluminium metal matrix composite: a review", *Journal of Reinforced Plastics and Composites*, (38:6), 2019, pp. 267-298.
- ❖ Maurya, Rakesh Kumar; Petale, Shrinivas; Thangaraj, Jaisingh; Priye, Vishnu, "Burst contention resolution using fiber delay management in WDM optical networks", *Wireless Personal Communications*, (107:2), 2019, pp. 785-796.
- ❖ Maurya, S. K.; Kushawaha, R.; Tiwari, S. P.; Kumar, A.; Kumar, K.; da Silva, Joaquim C. G. Esteves, "Thermal decomposition mediated Er³⁺/Yb³⁺ codoped NaGdF₄ upconversion phosphor for optical thermometry", *Materials Research Express*, (6:8), 2019.
- ❖ Mazumdar, Kaushik; Kala, Sanam; Ghosal, Aniruddha, "Nanocrack formation due to inverse piezoelectric effect in AlGaN/GaN HEMT", *Superlattices and Microstructures*, (125), 2019, pp. 120-124.
- ❖ Meena, Mukesh Kumar; Sinhamahapatra, Apurba; Kumar, Aditya, "Superhydrophobic polymer composite coating on glass via spin coating technique", *Colloid and Polymer Science*, (297), 2019, pp. 1499-1505.
- ❖ Midya, Lipi; Chettri, Avinash; Pal, Sagar, "Development of a novel nanocomposite using polypyrrole grafted chitosan-decorated CDs with improved photocatalytic activity under solar light illumination", *ACS Sustainable Chemistry & Engineering*, (7:10), 2019, pp. 9416-9421.
- ❖ Midya, Lipi; Das, Raghunath; Bhaumik, Madhumita; Sarkar, Tanumoy; Maity, Arjun; Pal, Sagar, "Removal of toxic pollutants from aqueous media using poly (vinyl imidazole) crosslinked chitosan synthesised through microwave assisted technique", *Journal of Colloid and Interface Science*, (542), 2019, pp. 187-197.
- ❖ Midya, Lipi; Patra, Abhay Shankar; Banerjee, Chranjib; Panda, Asit Baran; Pal, Sagar, "Novel nanocomposite derived from ZnO/CdS QDs embedded crosslinked chitosan: an efficient photocatalyst and effective antibacterial agent", *Journal of Hazardous Materials*, (369), 2019, pp. 398-407.
- ❖ Mishra, Akanksha; Gautam, Shalini; Sharma, T., "Gasification of jhama coal using statistical design of experiment",

- Transactions of the Indian Institute of Metals, (72:2), 2019, pp. 523-531.
- ❖ Mishra, Akshaya Kumar; Kumar, Ashutosh, "Modified Guo viscosity model for heavier hydrocarbon components and their mixtures", Journal of Petroleum Science and Engineering, (182), 2019.
 - ❖ Mishra, Ambikesh Kumar; Jain, Manish Kumar; Dash, Suwendu Kumar, "Ambient air quality and indexing with reference to suspended particulate matter and gaseous pollutants around a cement plant in OCL India Limited, Rajgangpur, Odisha, India", Current Science, (116:11), 2019, pp. 1905-1909.
 - ❖ Mishra, Arvind Kumar; Agrawal, Hemant; Raut, Manamohan, "Effect of aluminum content on detonation velocity and density of emulsion explosives", Journal of Molecular Modeling, (25:3), 2019.
 - ❖ Mishra, Deepak; Dutta, Saurabh; Baral, Arijit; Haque, Nasirul; Chakravorti, Sivaji, "Use of interfacial charge for diagnosis and activation energy prediction of oil-paper insulation used in power transformer", IEEE Transactions on Power Delivery, (34:4), 2019, pp. 1332-1340.
 - ❖ Mishra, Deepak; Haque, Nasirul; Baral, Arijit; Chakravorti, Sivaji, "Estimation of paper conductivity from short duration polarisation-depolarisation current for diagnosis of power transformer", IET Science Measurement & Technology, (13:8), 2019, pp. 1178-1185.
 - ❖ Mishra, Naveen; Choudhary, Dilip Kumar; Chaudhary, Raghvendra Kumar, "Miniaturized open-ended dual-band band-pass filter with series stepped capacitance and shunt meandered line inductance for microwave frequency applications", International Journal of Microwave and Wireless Technologies, (11:3), 2019, pp. 237-243.
 - ❖ Mishra, P. K.; Kumar, Subhash; Pratik; Kumar, Manish; Kumar, Jitendra, "IoT based multimode sensing platform for underground coal mines", Wireless Personal Communications, (108:2), 2019, pp. 1227-1242.
 - ❖ Mishra, Pawan; Singh, Sachin; Ranjan, Vinayak; Singh, Sonu; Vidyarthi, Ankit, "Performance evaluation of Jaipur knee joint through kinematics and kinetics gait symmetry with unilateral transfemoral Indian amputees", Journal of Medical Systems, (43:3), 2019.
 - ❖ Mishra, Rakesh Kumar; Pandey, Jai Krishna; Pandey, Jitendra; Kumar, Sumit; Roy, Paresh Nath Singha, "Detection and analysis of coal fire in Jharia coalfield (JCF) using landsat remote sensing data", Journal of the Indian Society of Remote Sensing, (48:2), 2020, pp. 181-195.
 - ❖ Mishra, Shailesh; Das, Sushrut; Pattnaik, Shyam S.; Kumar, Sachin; Kanaujia, Binod K., "Three-dimensional cylindrical design multiple-input-multiple-output/diversity antenna with high isolation for wireless communication applications", International Journal of RF and Microwave Computer-Aided Engineering, (30:1), 2020.
 - ❖ Mishra, Shailesh; Das, Sushrut; Pattnaik, Shyam Sunder; Kumar, Sachin; Kanaujia, Binod Kumar, "Low-profile circularly polarized planar antenna for GPS L1, L2, and L5 bands", Microwave and Optical Technology Letters, (62:2), 2020, pp. 806-815.
 - ❖ Mishra, Shekhar; Sharif, Arshian; Khuntia, Sashikanta; Meo, Muhammad Saeed; Khan, Syed Abdul Rehman, "Does oil prices impede Islamic stock indices? fresh insights from wavelet-based quantile-on-quantile approach", Resources Policy, (62), 2019, pp. 292-304.
 - ❖ Mishra, Shruti; Chaudhary, L. B.; Jain, M. K.; Kumar, Vipin; Behera, Soumit K., "Interaction of abiotic factor on soil CO₂ efflux in three forest communities in tropical deciduous forest from India", Environmental Monitoring and Assessment, (191), 2019.
 - ❖ Mishra, Shruti; Singh, Kripal; Sahu, Nayan; Singh, Shiv Naresh; Manika, N.; Chaudhary, L. B.; Jain, M. K.; Kumar, Vipin; Behera, Soumit K., "Understanding the relationship between soil properties and litter chemistry in three forest communities

- in tropical forest ecosystem", *Environmental Monitoring and Assessment*, (191), 2019.
- ❖ Mishra, Tapas Kumar; Tripathi, Sachin, "Minimizing end-to-end delay on real-time applications", *Wireless Personal Communications*, (107:1), 2019, pp. 41-55.
 - ❖ Mishra, Vivek; Chakravarty, Sanchita; Finkelman, Robert B.; Varma, Atul Kumar, "Geochemistry of rare earth elements in lower gondwana coals of the Talchir coal basin, India", *Journal of Geochemical Exploration*, (204), 2019, pp. 43-56.
 - ❖ Misra, Debjit; Barange, Sumit; Joardar, Hillol; Kumar, Jitendra; Das, Alok Kumar; ukhopadhyay, Suman; Chatterjee, Satyajit, "Comparative study on the tribological properties of laser post-treated and untreated AISI304 stainless steel matrix composite reinforced with hard ceramic particles (TiB₂-TiN-SiC) and prepared by ex-situ P/M route", *Ceramics International*, (45:15), 2019, pp. 18852-18864.
 - ❖ Misra, Satabdi; Varma, Atul Kumar; Hazra, Bodhisatwa; Biswas, Sanki; Samad, Suresh Kumar, "The influence of the thermal aureole asymmetry on hydrocarbon generative potential of coal beds: Insights from Raniganj basin, West Bengal, India", *International Journal of Coal Geology*, (206), 2019, pp. 91-105.
 - ❖ Misra, Saurav; Hussain, Manowar; Gupta, Ankit; Kumar, Vikas; Kumar, Shakti; Das, Alok Kumar, "Fabrication and characteristic evaluation of direct metal laser sintered SiC particulate reinforced Ti6Al4V metal matrix composites", *Journal of Laser Applications*, (31:1), 2019.
 - ❖ Mitra, Aniruddha; Dey, Sukanta; Zong, Keqing; Li, Yongsheng; Mitra, Anirban, "Building the core of a paleoarchean continent: evidence from granitoids of Singhbhum craton, eastern India", *Precambrian Research*, (335), 2019.
 - ❖ Modak, Paresh; Antony, Bobby, "Photoionization of CO using R-matrix theory", *Astrophysical Journal*, (887:2), 2019.
 - ❖ Modak, Paresh; Antony, Bobby, "Electron scattering from FO", *Journal of Physics B-Atomic Molecular and Optical Physics*, (52:9), 2019.
 - ❖ Mohanty, Biswajyoti; Sahoo, Karunakar; Nayak, J., "A two-step hydrothermal synthesis of CeO₂/CdS nanocomposite for photovoltaic application: an investigation on surface morphology, structure, optical and electrical properties", *Materials Research Express*, (6:9), 2019.
 - ❖ Mohanty, Chandra Sekhar; Khuntia, Partha Sarathi; Mitra, Debjani, "Design of stable nonlinear pitch control system for a jet aircraft by using artificial intelligence", *Proceedings of the National Academy of Sciences India Section A-Physical Sciences*, (89:1), 2019, pp. 57-66.
 - ❖ Mohanty, Shalini; Bhushan, Brij; Das, Alok Kumar; Dixit, Amit Rai, "Production of hard and lubricating surfaces on miniature components through micro-EDM process", *International Journal of Advanced Manufacturing Technology*, (105), 2019, pp. 1983-2000.
 - ❖ Mohanty, Shalini; Kumar, Vishnu; Das, Alok Kumar; Dixit, Amit Rai, "Surface modification of Ti-alloy by micro-electrical discharge process using tungsten disulphide powder suspension", *Journal of Manufacturing Processes*, (37), 2019, pp. 28-41.
 - ❖ Mohapatra, Saswat; Moirangthem, Rakesh S., "Fabrication of flexible and economical plasmonic biosensor using gold nanograting imprinted on hot-melt adhesive film for label-free sensing of immunoglobulin proteins", *Sensors and Actuators B-Chemical*, (301), 2019.
 - ❖ Mohindru, Gaurav; Mondal, Koushik; Banka, Haider, "Internet of things and data analytics: a current review", *Wiley Interdisciplinary Reviews-Data Mining and Knowledge Discovery*, (10:3), 2020.
 - ❖ Mondal, Amba; Das, Sourav; Manam, J., "Investigation on spectroscopic properties and temperature dependent photoluminescence of NIR emitting Cr³⁺

Research, Development, Innovation & Entrepreneurship

- doped zinc gallate long persistent nanophosphor", *Physica B-Condensed Matter*, (569), 2019, pp. 20-30.
- ❖ Mondal, Amba; Manam, J., "Investigations on spectroscopic properties and temperature dependent photoluminescence of Cr³⁺ doped MgGa₂O₄ phosphor", *Materials Research Express*, (6:9), 2019.
 - ❖ Mondal, Argha; Sharma, Sanjeev Kumar; Upadhyay, Ranjit Kumar; Aziz-Alaoui, M. A.; Kundu, Prosenjit; Hens, Chittaranjan, "Diffusion dynamics of a conductance-based neuronal population", *Physical Review E*, (99:4), 2019.
 - ❖ Mondal, Argha; Sharma, Sanjeev Kumar; Upadhyay, Ranjit Kumar; Mondal, Arnab, "Firing activities of a fractional-order FitzHugh-Rinzel bursting neuron model and its coupled dynamics", *Scientific Reports*, (9), 2019.
 - ❖ Mondal, Argha; Upadhyay, Ranjit Kumar; Ma, Jun; Yadav, Binesh Kumar; Sharma, Sanjeev Kumar; Mondal, Arnab, "Bifurcation analysis and diverse firing activities of a modified excitable neuron model", *Cognitive Neurodynamics*, (13:4), 2019, pp. 393-407.
 - ❖ Mondal, Debjeet; Roy, P. N. S., "Fractal and seismic b-value study during dynamic roof displacements (roof fall and surface blasting) for enhancing safety in the longwall coal mines", *Engineering Geology*, (253), 2019, pp. 184-204.
 - ❖ Mondal, Haraprasad; Sen, Mrinal; Goswami, Kamanashis, "Design and analysis of a 0.9 Tb/s six-channel WDM filter based on photonic crystal waveguides", *Journal of the Optical Society of America B-Optical Physics*, (36:11), 2019, pp. 3181-3188.
 - ❖ Mondal, Haraprasad; Sen, Mrinal; Goswami, Kamanashis, "Design and analysis of all-optical 1-to-2 line decoder based on linear photonic crystal", *IET Optoelectronics*, (13:4), 2019, pp. 191-195.
 - ❖ Mondal, Krishanu; Halder, Pallabi; Gopalan, Greeshma; Sasikumar, P.; Radhakrishnan, K. V.; Das, Parthasarathi, "Chloroform as a CO surrogate: applications and recent developments", *Organic & Biomolecular Chemistry*, (17:21), 2019, pp. 5212-5222.
 - ❖ Mondal, S. K.; Roy, P. N. S.; Catherine, J. K.; Pandey, A. K., "Significance of fractal correlation dimension and seismic b-value variation due to 15th July 2009, New Zealand earthquake of Mw 7.8", *Annals of Geophysics*, (62), 2019.
 - ❖ Mondal, S.; Sahu, S. A.; Pankaj, K. K., "Transference of Love-type waves in a bedded structure containing a functionally graded material and a porous piezoelectric medium", *Applied Mathematics and Mechanics-English Edition*, (40:8), 2019, pp. 1083-1096.
 - ❖ Mondal, Samit; Chatterjee, Rima, "Quantitative risk assessment for optimum mud weight window design: a case study", *Journal of Petroleum Science and Engineering*, (176), 2019, pp. 800-810.
 - ❖ Mondal, Shuvashree; Kundu, Debasis, "Inference on Weibull parameters under a balanced two-sample type II progressive censoring scheme", *Quality and Reliability Engineering International*, (36:1), 2020, pp. 1-17.
 - ❖ Mondal, Shuvashree; Kundu, Debasis, "Exact inference on multiple exponential populations under a joint type-II progressive censoring scheme", *Statistics*, (53:6), 2019, pp. 1329-1356.
 - ❖ Mondal, Sonali; Sahu, Sanjeev Anand, "Propagation of SH waves in corrugated FGPM layer lying over a piezomagnetic half-space", *Mechanics of Advanced Materials and Structures*, (26:1), 2019, pp. 29-34.
 - ❖ Mondal, Subhendu; Guha, Arindam; Pal, Sanjit Kumar; Porwal, Alok; Chatterjee, Snehamoy; Rani, Komal; Pour, Amin Beiranvand; Kumar, K. Vinod, "Conjugate utilization of Landsat-8 OLI, ground gravity and magnetic data for targeting mafic cumulates within anorthositic-layered complex of Sittampundi, India", *Geocarto International*, 2019.

- ❖ Mudi, Joyti; Shiva, Chandan K.; Mukherjee, V., "Multi-verse optimization algorithm for LFC of power system with imposed nonlinearities using three-degree-of-freedom PID controller", Iranian Journal of Science and Technology-Transactions of Electrical Engineering, (43:4), 2019, pp. 837-856.
- ❖ Mujawdiya, Ritesh; Chatterjee, Rajat S.; Kumar, Dheeraj; Singh, Narendra, "Detection of bad data images in long-term MODIS land surface temperature image time series using statistical outlier detection methods", Journal of Applied Remote Sensing, (13:4), 2019.
- ❖ Mukherjee, Debasish; Mukhopadhyay, Susanta, "Fast hardware architecture for fixed-point 2D Gaussian filter", AEU-International Journal of Electronics and Communications, (105), 2019, pp. 98-105.
- ❖ Mukherjee, Mrinal Kanti; Modak, Kunal, "Timing of cleavage development in relation to folding and its implications: an example from the deformed mesoproterozoic sedimentary cover of Kaladgi basin, southwestern India", Journal of the Geological Society of India, (93:4), 2019, pp. 379-391.
- ❖ Mukherjee, Mrinal Kanti; Modak, Kunal; Ghosh, Jiten, "Illite crystallinity index from the mesoproterozoic sedimentary cover of the Kaladgi basin, southwestern India: implications on crustal depths of subsidence and deformation", Journal of Earth System Science, (128:4), 2019.
- ❖ Mukherjee, Priya; Saravanan, Pichiah, "Perspective view on materialistic, mechanistic and operating challenges of microbial fuel cell on commercialisation and their way ahead", Chemistryselect, (4:5), 2019, pp. 1601-1612.
- ❖ Mukherjee, Rahul; Venkatesh, Akella Satya; Fareeduddin, "Geochemical characterization of mineralized albitite from paleoproterozoic bhukia IOCG-IOA deposit of Aravalli-Delhi fold belt, Rajasthan, western India: genetic linkage to the gold (+/- Cu +/- U) mineralization", Geological Journal, (55:6), 2020, pp. 4203-4225.
- ❖ Mukherjee, Sankar; Amin, Ruhul; Biswas, G. P., "Design of routing protocol for multi-sink based wireless sensor networks", Wireless Networks, (25:7), 2019, pp. 4331-4347.
- ❖ Mukherjee, Sankar; Gupta, Daya Sagar; Biswas, G. P., "An efficient and batch verifiable conditional privacy-preserving authentication scheme for VANETs using lattice", Computing, (101:12), 2019, pp. 1763-1788.
- ❖ Murmu, Lakhindar; Koley, Santasri; Bage, Amit; Das, Sushrut, "A simple WiMAX and RFID band-notched UWB bandpass filter and its susceptibility study", Journal of Circuits Systems and Computers, (28:11), 2019.
- ❖ Nag, Akash; Hloch, Sergej; Cuha, Dominik; Dixit, Amit Rai; Tozan, Hakan; Petru, Jana; Hromasova, Monika; Mueller, Miroslav, "Acoustic chamber length performance analysis in ultrasonic pulsating water jet erosion of ductile material", Journal of Manufacturing Processes, (47), 2019, pp. 347-356.
- ❖ Nainegali, Lohitkumar; Basudhar, Prabir Kumar; Ghosh, Priyanka, "Interference of proposed footing with an existing footing resting on non-linearly elastic dense and loose cohesionless soil bed", European Journal of Environmental and Civil Engineering, 2019.
- ❖ Naladala, Nagasrinivasa Rao; Singh, Rambabu; Venkatesh, A. S.; Bose, P.; Babu, Prasad K.; Narayan, I. D., "Effectiveness of bio-activated carbon filtration and ozonation on control of halo acetic acids formation during chlorination of Ganga river water at Kanpur, India", Ozone-Science & Engineering, 2019.
- ❖ Nanda, Debasis; Sahoo, Abanti; Kumar, Aditya; Bhushan, Bharat, "Facile approach to develop durable and reusable superhydrophobic/ superoleophilic coatings for steel mesh surfaces", Journal of Colloid and Interface Science, (535), 2019, pp. 50-57.
- ❖ Nanda, Diptimayee; Mandre, N. R., "Mechanism of polymeric adsorption in

- selective flocculation of low-grade iron ore", *Separation Science and Technology*, 2019.
- ❖ Nandi, Barun Kumar; Bhattacharya, Sumantra, "Effect of weathering and stockpile design on physicochemical properties of an Indian thermal coal", *International Journal of Coal Preparation and Utilization*, 2019.
 - ❖ Nandi, Mahendra; Shiva, Chandan Kumar; Mukherjee, Vivekananda, "A moth-flame optimization for UPFC-RFB-based load frequency stabilization of a realistic power system with various nonlinearities", *Iranian Journal of Science and Technology-Transactions of Electrical Engineering*, (43), 2019, pp. 581-606.
 - ❖ Nandy, Jinia; Dey, Sukanta; Heilimo, Esa, "Neoarchean magmatism through arc and lithosphere melting: Evidence from eastern Dharwar craton", *Geological Journal*, (54:5), 2019, pp. 3148-3166.
 - ❖ Narayan, Ashish; Narayanan, S.; Kumar, Rakesh; Singh, Tarandeep; Kumar, C. S.; Jagadeesh, G., "Control of aerodynamic drag and heating of nose cones through taper spikes", *Journal of Spacecraft and Rockets*, (56:4), 2019, pp. 1165-1176.
 - ❖ Narayanan, S.; Samanta, A.; Narayan, Ashish; Jha, Shailesh Kumar, "Computational study of partially covered Hartmann whistle in a sonic-underexpanded jet", *Iranian Journal of Science and Technology-Transactions of Mechanical Engineering*, (43:4), 2019, pp. 639-661.
 - ❖ Nath, Somalin; Chatterjee, R. S.; Mohanty, S. P.; Gaurav, Shashi, "Comparative evaluation of active tectonics in parts of the frontal region of NW Himalaya, India by geomorphic analysis and geophysical investigation", *Journal of the Geological Society of India*, (94:2), 2019, pp. 197-205.
 - ❖ Nawaz, Ahmad; Singh, Siddharth; Saravanan, Pichiah, "Black carbon aerosols from the coal seam of eastern India: a real-time analysis with statistical validation", *Journal of Earth System Science*, (128:5), 2019.
 - ❖ Nayak, Debashish; Choudhary, Ram Bilash, "Augmented optical and electrical properties of PMMA-ZnS nanocomposites as emissive layer for OLED applications", *Optical Materials*, (91), 2019, pp. 470-481.
 - ❖ Negi, Anil; Singh, Abhishek Kumar, "Analysis on scattering characteristics of love-type wave due to surface irregularity in a piezoelectric structure", *Journal of the Acoustical Society of America*, (145:6), 2019, pp. 3756-3783.
 - ❖ Neogi, Kaushik; Sadhu, Moumita; Das, Niladri; Sadhu, Pradip Kumar; Chakraborty, Agamani; Ganguly, Ankur; Banerjee, Atanu, "A new approach for the stability analysis of high-frequency series resonant inverter-fitted induction heater", *Ain Shams Engineering Journal*, (10:1), 2019, pp. 185-194.
 - ❖ Nirwal, Sonal; Sahu, Sanjeev A.; Baroi, Juhi; Saroj, Pradeep K., "Analysis of wave scattering in 3-layer piezo composite structure [Pb[ZrxTi1-x]O-3-ALN-Pb[ZrxTi1-x]O-3]", *Mechanics Based Design of Structures and Machines*, 2019.
 - ❖ Nirwal, Sonal; Sahu, Sanjeev A.; Singhal, Abhinav; Baroi, Juhi, "Analysis of different boundary types on wave velocity in bedded piezo-structure with flexoelectric effect", *Composites Part B-Engineering*, (167), 2019, pp. 434-447.
 - ❖ Nitesh, Kumar; Jana, Prasanta K., "Convex hull based trajectory design for mobile sink in wireless sensor networks", *International Journal of Ad Hoc and Ubiquitous Computing*, (30:1), 2019, pp. 26-36.
 - ❖ Nitesh, Kumar; Kaswan, Amar; Jana, Prasanta K., "Energy density based mobile sink trajectory in wireless sensor networks", *Microsystem Technologies-Micro-and Nanosystems-Information Storage and Processing Systems*, (25:5), 2019, pp. 1771-1781.
 - ❖ Oppong, Godfred Kesse; Pattanayak, J. K., "Does investing in intellectual capital improve productivity? panel evidence from commercial banks in India", *Borsa Istanbul Review*, (19:3), 2019, pp. 219-227.

- ❖ Oppong, Godfred Kesse; Pattanayak, Jamina Kanta; Irfan, Mohd., "Impact of intellectual capital on productivity of insurance companies in Ghana- a panel data analysis with system GMM estimation", *Journal of Intellectual Capital*, (20:6), 2019, pp. 763-783.
- ❖ Orji, Ifeyinwa Juliet; Kusi-Sarpong, Simonov; Gupta, Himanshu, "The critical success factors of using social media for supply chain social sustainability in the freight logistics industry", *International Journal of Production Research*, (58:5), 2020, pp. 1522-1539.
- ❖ Orji, Ifeyinwa Juliet; Kusi-Sarpong, Simonov; Gupta, Himanshu; Okwu, Modestus, "Evaluating challenges to implementing eco-innovation for freight logistics sustainability in Nigeria", *Transportation Research Part A-Policy and Practice*, (129), 2019, pp. 288-305.
- ❖ Pal, Arup Kumar; Naik, Kshiramani; Agarwal, Rohit, "A steganography scheme on JPEG compressed cover image with high embedding capacity", *International Arab Journal of Information Technology*, (16:1), 2019, pp. 116-124.
- ❖ Pal, Biswajit; Dwari, Santanu, "Harmonic suppressed tunable bandpass filter using varactor-tuned stub-loaded resonator", *IETE Journal of Research*, 2019.
- ❖ Pal, Biswajit; Mandal, Mrinal Kanti; Dwari, Santanu, "Varactor tuned dual-band bandpass filter with independently tunable band positions", *IEEE Microwave and Wireless Components Letters*, (29:4), 2019, pp. 255-257.
- ❖ Pal, Divya; Maiti, Subodh Kumar, "Evaluation of potential human health risks from toxic metals via consumption of cultured fish species *labeo rohita*: a case study from an urban aquaculture pond", *Exposure and Health*, (11:1), 2019, pp. 33-46.
- ❖ Pal, Divya; Maiti, Subodh Kumar, "Abatement of cadmium (Cd) contamination in sediment using tea waste biochar through meso-microcosm study", *Journal of Cleaner Production*, (212), 2019, pp. 986-996.
- ❖ Pal, Nilanjan; Kumar, Narendra; Mandal, Ajay, "Stabilization of dispersed oil droplets in nanoemulsions by synergistic effects of the gemini surfactant, PHPA polymer, and silica nanoparticle", *Langmuir*, (35:7), 2019, pp. 2655-2667.
- ❖ Pal, Nilanjan; Kumar, Narendra; Saw, Rohit Kumar; Mandal, Ajay, "Gemini surfactant/polymer/silica stabilized oil-in-water nanoemulsions: design and physicochemical characterization for enhanced oil recovery", *Journal of Petroleum Science and Engineering*, (183), 2019.
- ❖ Pal, Nilanjan; Kumar, Sudhir; Bera, Achinta; Mandal, Ajay, "Phase behaviour and characterization of microemulsion stabilized by a novel synthesized surfactant: implications for enhanced oil recovery", *Fuel*, (235), 2019, pp. 995-1009.
- ❖ Pal, Nilanjan; Samanta, Krishanu; Mandal, Ajay, "A novel family of non-ionic gemini surfactants derived from sunflower oil: synthesis, characterization and physicochemical evaluation", *Journal of Molecular Liquids*, (275), 2019, pp. 638-653.
- ❖ Pal, Nilanjan; Vajpayee, Mudit; Mandal, Ajay, "Cationic/nonionic mixed surfactants as enhanced oil recovery fluids: influence of mixed micellization and polymer association on interfacial, rheological, and rock-wetting characteristics", *Energy & Fuels*, (33:7), 2019, pp. 6048-6059.
- ❖ Pal, Pankaj; Tripathi, Sachin; Kumar, Chiranjeev, "Bandwidth estimation in high mobility scenarios of IEEE 802.11 infrastructure-less mobile ad hoc networks", *International Journal of Communication Systems*, (32:15), 2019.
- ❖ Pal, Pankaj; Tripathi, Sachin; Kumar, Chiranjeev, "Clustered heterogeneous wireless sensor network infrastructure for reliable and efficient path planning of mobile nodes in remote area", *International Journal of Sensor Networks*, (31:4), 2019, pp. 199-215.

- ❖ Pal, Priyanka; Tiwari, S. P., "On L-M-valued automata: an operator oriented view", *Journal of Applied Mathematics and Computing*, (62), 2020, pp. 587-609.
- ❖ Pal, Sanjit Kumar; Kumar, Sarvesh, "Subsurface structural mapping using EIGEN6C4 data over Bundelkhand craton and surroundings: an appraisal on kimberlite/lamproite emplacement", *Journal of the Geological Society of India*, (94:2), 2019, pp. 188-196.
- ❖ Pal, Souvik; Dey, Kartick; Benmansour, Samia; Gomez-Garcia, Carlos J.; Nayek, Hari Pada, "Syntheses, structures and magnetic properties of cyano-bridged one-dimensional Ln³⁺-Fe³⁺ (Ln = La, Dy, Ho and Yb) coordination polymers", *New Journal of Chemistry*, (43:16), 2019, pp. 6228-6233.
- ❖ Panda, Anita; Kumar, A.; Munshi, Basudeb; Mohapatra, S. S., "The enhancement of dropwise and spray evaporative cooling by using extract of reetha added water as a coolant", *Thermochimica Acta*, (680), 2019.
- ❖ Panda, Anita; Mohapatra, S. S.; Kumar, A., "Polyethylene-glycol-added water-droplet evaporative cooling for fast cooling operations", *Journal of Thermophysics and Heat Transfer*, (33:3), 2019, pp. 686-697.
- ❖ Panda, Anita; Pati, A. R.; Kumar, A.; Mohapatra, S. S., "Dropwise evaporation of hydrophilic coolant droplets: a methodology for the development of hydrophilic coating and attainment of enhanced heat transfer", *International Communications in Heat and Mass Transfer*, (105), 2019, pp. 19-27.
- ❖ Panda, Anita; Pati, A. R.; Saha, B.; Kumar, A.; Mohapatra, S. S., "The role of viscous and capillary forces in the prediction of critical conditions defining superhydrophobic and hydrophilic characteristics", *Chemical Engineering Science*, (207), 2019, pp. 527-541.
- ❖ Panda, Balakrushna; Venkatesh, Madavi; Kumar, Bijendra; Anshumali, "A GIS-based approach in drainage and morphometric analysis of Ken river basin and sub-basins, central India", *Journal of the Geological Society of India*, (93:1), 2019, pp. 75-84.
- ❖ Panda, Sanjaya K.; Gupta, Indrajeet; Jana, Prasanta K., "Task scheduling algorithms for multi-cloud systems: allocation-aware approach", *Information Systems Frontiers*, (21:2), 2019, pp. 241-259.
- ❖ Panda, Sanjaya K.; Jana, Prasanta K., "Load balanced task scheduling for cloud computing: a probabilistic approach", *Knowledge and Information Systems*, (61:3), 2019, pp. 1607-1631.
- ❖ Panda, Sanjaya K.; Jana, Prasanta K., "An energy-efficient task scheduling algorithm for heterogeneous cloud computing systems", *Cluster Computing-the Journal of Networks Software Tools and Applications*, (22:2), 2019, pp. 509-527.
- ❖ Panda, Surajit; Jain, Manish Kumar; Jeyaseelan, A. T.; Banerjee, Krishnendu, "Satellite image derived spectral modeling to assess the grades of hematite deposits: a study on Noamundi area in west Singhbhum district, Jharkhand", *Geocarto International*, 2019.
- ❖ Pandey, Ajit Kumar; Dasgupta, K.; Kumar, N., "Steady-state performance investigation of closed-circuit hydrostatic system: a practical approach", *Kuwait Journal of Science*, (46:1), 2019, pp. 76-83.
- ❖ Pandey, Ajit Kumar; Vardhan, Alok; Dasgupta, K., "Theoretical and experimental studies of the steady-state performance of a primary and secondary-controlled closed-circuit hydrostatic drive", *Proceedings of the Institution of Mechanical Engineers Part E-Journal of Process Mechanical Engineering*, (233:5), 2019, pp. 1024-1035.
- ❖ Pandey, Atul Kumar; Chatterjee, Rima; Choudhury, Biswajit, "Application of neural network modelling for classifying hydrocarbon bearing zone, water bearing zone and shale with estimation of petrophysical parameters in Cauvery basin, India", *Journal of Earth System Science*, (129:1), 2019.

- ❖ Pandey, Auchitya Kumar; Chingtham, Prasanta; Prajapati, Sanjay K.; Roy, P. N. S.; Gupta, A. K., "Recent seismicity rate forecast for north east India: an approach based on rate state friction law", *Journal of Asian Earth Sciences*, (174), 2019, pp. 167-176.
- ❖ Pandey, Mukesh Kumar; Malaidurai, M.; Thangavel, Rajalingam; Kar, Asit Kumar, "Magnetoimpedance study of nickel incorporated diamond like carbon thin films", *Materials Research Express*, (6:9), 2019.
- ❖ Pandey, Shashi Kant; Pandey, Ganga Prasad; Sarun, P. M., "Circularly polarized micro-strip antenna with fractal trees loaded ground plane", *Electromagnetics*, (39:7), 2019, pp. 505-523.
- ❖ Pankaj, K. K.; Sahu, S. A.; Kumari, S., "Surface wave transference in a piezoelectric cylinder coated with reinforced material", *Applied Mathematics and Mechanics-English Edition*, (41:1), 2020, pp. 123-138.
- ❖ Pant, Swati; Singh, Sahendra; Sahoo, P. R.; Kumar, Ajay; Saravanan, B.; Venkatesh, A. S.; Yadav, G. S.; Kumar, Pramod, "Mineral chemistry and geothermometry of chlorites in relation to physico-chemical conditions of uranium mineralization in the central part of the Singhbhum Shear Zone, eastern India", *Ore Geology Reviews*, (112), 2019.
- ❖ Pareek, Prakash; Ranjan, Ravi; Agarwal, Vipul; Singh, Lokendra; Pandey, S. K.; Palodiya, Vikram; Das, M. K., "Modeling and design of tin doped group IV alloy based QWEAM", *Optical and Quantum Electronics*, (51:7), 2019.
- ❖ Pareek, Shubhra; Jain, Deepti; Hussain, Shamima; Biswas, Amrita; Shrivastava, Rahul; Parida, Saroj K.; Kisan, Hemanta K.; Lgaz, Hassane; Chung, Ill-Min; Behera, Debasis, "A new insight into corrosion inhibition mechanism of copper in aerated 3.5 wt.% NaCl solution by eco-friendly imidazopyrimidine dye: experimental and theoretical approach", *Chemical Engineering Journal*, (358), 2019, pp. 725-742.
- ❖ Pasupuleti, S.; Sandilya, D. K.; Singha, S.; Singha, S. S.; Saha, S., "Delineation of groundwater potential zones utilising geospatial techniques in Kadiri watershed of Anantapur district, Andhra Pradesh, India", *Journal of Environmental Biology*, (40:1), 2019, pp. 61-68.
- ❖ Pathak, A. K.; Ghosh, S.; Gangwar, R. K.; Rahman, B. M. A.; Singh, V. K., "Metal nanowire assisted hollow core fiber sensor for an efficient detection of small refractive index change of measurand liquid", *Plasmonics*, (14:6), 2019, pp. 1823-1830.
- ❖ Pathak, A. K.; Rahman, B. M. A.; Singh, V. K.; Kumari, S., "Sensitivity enhancement of a concave shaped optical fiber refractive index sensor covered with multiple Au nanowires", *Sensors*, (19:19), 2019.
- ❖ Pathak, Uttarini; Roy, Ananya; Mandal, Dalia Dasgupta; Das, Papita; Kumar, Tarkeshwar; Mandal, Tamal, "Bioattenuation of phenol and cyanide involving immobilised spent tea activated carbon with *alcaligenes faecalis* JF339228: critical assessment of the degraded intermediates", *Asia-Pacific Journal of Chemical Engineering*, (14:1), 2019.
- ❖ Patra, Kiranmala; Anand, R.; Balakrishnan, S.; Dash, Jitendra K., "Geochemistry of ultramafic-mafic rocks of Mesoarchean Sargur Group, western Dharwar craton, India: implications for their petrogenesis and tectonic setting", *Journal of Earth System Science*, (129:1), 2019.
- ❖ Patra, Priyapratim; Seesala, Venkata Sundeep; Soni, Saundray Raj; Roy, Rakesh Kumar; Dhara, Santanu; Ghosh, Animesh; Patra, Niladri; Pal, Sagar, "Biopolymeric pH-responsive fluorescent gel for in-vitro and in-vivo colon specific delivery of metronidazole and ciprofloxacin", *European Polymer Journal*, (114), 2019, pp. 255-264.
- ❖ Patra, Priyapratim; Soni, Saundray Raj; Seesala, Venkata Sundeep; Dhara, Santanu; Ghosh, Animesh; Pal, Sagar, "Synthesis of a novel copolymer using glycogen and poly(lactide) as a carrier of dual drugs-ornidazole and ofloxacin", *Journal of*

- Polymer Science Part A-Polymer Chemistry, (57:15), 2019, pp. 1697-1703.
- ❖ Patra, Satyananda; Pattanaik, Abhyarthana; Rayasam, Venugopal, "Characterisation of low-grade Barsua iron ore fines and identification of possible beneficiation strategies", Canadian Metallurgical Quarterly, (58:1), 2019, pp. 28-45.
 - ❖ Patra, Satyananda; Pattanaik, Abhyarthana; Venkatesh, Akella Satya; Venugopal, Rayasam, "Mineralogical and chemical characterization of low grade iron ore fines from Barsua area, eastern India with implications on beneficiation and waste utilization", Journal of the Geological Society of India, (93:4), 2019, pp. 443-454.
 - ❖ Pattanaik, Abhyarthana; Patra, Satyananda; Rayasam, Venugopal, "Selection of a viable upgradation strategy through physico-chemical and mineralogical approach: a case study of low grade Barsua iron ore fines", Transactions of the Indian Institute of Metals, (73:1), 2020, pp. 47-63.
 - ❖ Paul, Priya Kumari; Saraswat, Vandana; Yadav, Mahendra, "Chromenes as efficient corrosion inhibitor for mild steel in HCl solution", Journal of Adhesion Science and Technology, (33:12), 2019, pp. 1275-1293.
 - ❖ Perwez, Ashif; Kumar, Rakesh, "Thermal performance investigation of the flat and spherical dimple absorber plate solar air heaters", Solar Energy, (193), 2019, pp. 309-323.
 - ❖ Perwez, Ashif; Kumar, Rakesh, "Heat transfer performance investigation of the spherical dimple heat sink and inclined teardrop dimple heat sink", Numerical Heat Transfer Part A-Applications, (76:2), 2019, pp. 73-86.
 - ❖ Perwez, Ashif; Shende, Shreyak; Kumar, Rakesh, "Heat transfer and friction factor characteristic of spherical and inclined teardrop dimple channel subjected to forced convection", Experimental Heat Transfer, (32:2), 2019, pp. 159-178.
 - ❖ Pillai, Prathibha; Mandal, Ajay, "Wettability modification and adsorption characteristics of imidazole-based ionic liquid on carbonate rock: implications for enhanced oil recovery", Energy & Fuels, (33:2), 2019, pp. 727-738.
 - ❖ Pillai, Prathibha; Saw, Rohit Kumar; Singh, Ranvijay; Padmanabhan, Eswaran; Mandal, Ajay, "Effect of synthesized lysine-grafted silica nanoparticle on surfactant stabilized O/W emulsion stability: application in enhanced oil recovery", Journal of Petroleum Science and Engineering, (177), 2019, pp. 861-871.
 - ❖ Prabhu, M. S.; Nayak, Paresh Kumar; Pradhan, Gayadhar, "Detection of three-phase fault during power swing using zero frequency filtering", International Transactions on Electrical Energy Systems, (29:1), 2019.
 - ❖ Prabhu, Vignesh; Gupta, Sunil K.; Madhwal, Sandeep; Shridhar, Vijay, "Exposure to atmospheric particulates and associated respirable deposition dose to street vendors at the residential and commercial sites in Dehradun city", Safety and Health at Work, (10:2), 2019, pp. 237-244.
 - ❖ Pradhan, Akash Kumar; Sen, Mrinal, "An integrable all-silicon slotted photonic crystal Raman laser", Journal of Applied Physics, (126:23), 2019.
 - ❖ Pradhan, D.; Panda, B. S., "Computing a minimum paired-dominating set in strongly orderable graphs", Discrete Applied Mathematics, (253), 2019, pp. 37-50.
 - ❖ Pradhan, Jitesh; Pal, Arup Kumar; Banka, Haider, "Principal texture direction based block level image reordering and use of color edge features for application of object based image retrieval", Multimedia Tools and Applications, (78:2), 2019, pp. 1685-1717.
 - ❖ Pradhan, Nabanita; Gupta, Saurabh Datta; Mohanty, P. R., "Velocity anisotropy analysis for shale lithology of the complex geological section in Jaisalmer sub-basin, India", Journal of Earth System Science, (128:8), 2019.
 - ❖ Prakash, Choudhary Shyam; Om, Hari; Maheshkar, Sushila, "Authentication of

- medical images using passive approach", IET Image Processing, (13:13), 2019, pp. 2420-2427.
- ❖ Prakash, Choudhary Shyam; Panzade, Prajwal Pralhad; Om, Hari; Maheshkar, Sushila, "Detection of copy-move forgery using AKAZE and SIFT keypoint extraction", Multimedia Tools and Applications, (78:16), 2019, pp. 23535-23558.
 - ❖ Prakash, Prem; Chakraborty, Prasun Kumar; Priya, Tanwi; Mishra, Brijesh Kumar, "Performance evaluation of saponin over other organic acid and tap water for removal of chromium in tannery sludge by electrokinetic enhancement", Separation Science and Technology, (54:1), 2019, pp. 173-182.
 - ❖ Prakash, Ved; Kumar, P.; Singh, P. K.; Hussain, M.; Das, A. K.; Chattopadhyaya, S., "Micro-electrical discharge machining of difficult-to-machine materials: a review", Proceedings of the Institution of Mechanical Engineers Part B-Journal of Engineering Manufacture, (233:2), 2019, pp. 339-370.
 - ❖ Prasad, Akhilesh; Ansari, Z. A., "Approximation of linear canonical wavelet transform on the generalized Sobolev spaces", Journal of Pseudo-Differential Operators and Applications, (10:4), 2019, pp. 855-881.
 - ❖ Prasad, Akhilesh; Ansari, Z. A., "Continuous wavelet transform involving linear canonical transform", National Academy Science Letters-India, (42:4), 2019, pp. 337-344.
 - ❖ Prasad, Akhilesh; Kumar, Praveen; Kumar, Tanuj, "Product of continuous fractional wave packet transforms", International Journal of Wavelets Multiresolution and Information Processing, (17:4), 2019.
 - ❖ Prasad, Akhilesh; Kumar, Tanuj, "A pair of linear canonical Hankel transformations of random order", Mediterranean Journal of Mathematics, (16:6), 2019.
 - ❖ Prasad, Akhilesh; Mandal, U. K.; Verma, S. K., "Zero-order Mehler-Fock transform and Sobolev-type space", Mathematical Inequalities & Applications, (22:2), 2019, pp. 761-775.
 - ❖ Prasad, Akhilesh; Sharma, P. B., "The quadratic-phase Fourier wavelet transform", Mathematical Methods in the Applied Sciences, (43:4), 2020, pp. 1953-1969.
 - ❖ Prasad, Akhilesh; Singh, Manoj Kumar, "Composition of pseudo-differential operators associated with Jacobi differential operator", Proceedings of the National Academy of Sciences India Section A-Physical Sciences, (89:3), 2019, pp. 509-516.
 - ❖ Prasad, Akhilesh; Verma, S. K., "The Mehler-Fock-Clifford transform and pseudo-differential operator on function spaces", Filomat, (33:8), 2019, pp. 2457-2469.
 - ❖ Prasad, Akhilesh; Verma, Sandeep Kumar, "Heat kernel in the framework of zero order Mehler-Fock transform", Complex Analysis and Operator Theory, (13:7), 2019, pp. 3235-3249.
 - ❖ Prasad, Ch D.; Nayak, Paresh Kumar, "A DFT-ED based approach for detection and classification of faults in electric power transmission networks", Ain Shams Engineering Journal, (10:1), 2019, pp. 171-178.
 - ❖ Prasad, Haridwar; Kumar, Pratap; Yadav, Rakesh Kumar; Mallick, Ashis; Kumar, Navneet; Singh, Desh Bandhu, "Sensitivity analysis of N identical partially covered (50%) PVT compound parabolic concentrator collectors integrated double slope solar distiller unit", Desalination and Water Treatment, (153), 2019, pp. 54-64.
 - ❖ Prasad, Shiv; Pal, Arup Kumar, "A tamper detection suitable fragile watermarking scheme based on novel payload embedding strategy", Multimedia Tools and Applications, (79), 2020, pp. 1673-1705.
 - ❖ Prasad, Suraj; Narayanan, S.; Mandal, Deepak Kumar, "Acoustic induced flow around an evaporating drop and its influence on internal circulation",

- International Journal of Multiphase Flow, (116), 2019, pp. 91-99.
- ❖ Priya, J.; Kunti, A. K.; Sharma, S. K., "Luminescence properties of thermally stable silica incorporated dysprosium beta-diketonate Complexes", ECS Journal of Solid State Science and Technology, (8:6), 2019, pp. R79-R83.
 - ❖ Priya, Kumari Shilpa; Burman, Isha; Tarafdar, Abhrajyoti; Sinha, Alok, "Impact of ammonia nitrogen on COD removal efficiency in anaerobic hybrid membrane bioreactor treating synthetic leachate", International Journal of Environmental Research, (13:1), 2019, pp. 59-65.
 - ❖ Priya, Shruti; Dwari, Santanu; Kumar, Kundan; Mandal, Mrinal Kanti, "Compact self-quadruplexing SIW cavity-backed slot antenna", IEEE Transactions on Antennas and Propagation, (67:10), 2019, pp. 6656-6660.
 - ❖ Priya, Shruti; Kumar, Kundan; Dwari, Santanu, "Substrate integrated waveguide dual-frequency dual-sense circularly polarized cavity-backed slot antenna", International Journal of RF and Microwave Computer-Aided Engineering, (29:12), 2019.
 - ❖ Puri, Shiv C.; Das, Sushrut; Tiary, Madan G., "UWB monopole antenna with dual-band-notched characteristics", Microwave and Optical Technology Letters, (62:3), 2020, pp. 1222-1229.
 - ❖ Puri, Shiv Charan; Das, Sushrut; Tiary, Madan Gopal, "An UWB trapezoidal rings fractal monopole antenna with dual-notch characteristics", International Journal of RF and Microwave Computer-Aided Engineering, (29:8), 2019.
 - ❖ Purkait, Rajesh; Tripathi, Sachin, "Fuzzy logic based multi-criteria intelligent forward routing in VANET", Wireless Personal Communications, (111:3), 2020, pp. 1871-1897.
 - ❖ Purty, Bela; Choudhary, Ram Bilash; Biswas, Amrita; Udayabhanu, G., "Chemically grown mesoporous f-CNT/-MnO₂/PI nanocomposites as electrode materials for supercapacitor application", Polymer Bulletin, (76:4), 2019, pp. 1619-1640.
 - ❖ Purty, Bela; Choudhary, Ram Bilash; Biswas, Amrita; Udayabhanu, G., "Temperature dependent supercapacitive performance of NH₃ modified TiO₂ decorated PPy nanohybrids in various electrolyte systems", Synthetic Metals, (249), 2019, pp. 1-13.
 - ❖ Quereshi, Shireen; Ahmad, Ejaz; Pant, Kamal Kishore; Dutta, Suman, "Synthesis and characterization of zirconia supported silicotungstic acid for ethyl levulinate production", Industrial & Engineering Chemistry Research, (58:35), 2019, pp. 16045-16054.
 - ❖ Radhakrishnan, E.; Kumaraswamidhas, L. A.; Palanikumar, K.; Muruganandam, D., "Strength and hardness studies of C44300 tube to AA7075-T651 tube plate threaded and unthreaded dissimilar joints fabricated by friction welding process", Journal of Materials Research and Technology-JMR&T, (8:4), 2019, pp. 3424-3433.
 - ❖ Rafi, Mudassir; Mukhopadhyay, Susanta, "Salient object detection employing regional principal color and texture cues", Multimedia Tools and Applications, (78:14), 2019, pp. 19735-19751.
 - ❖ Rafi, Mudassir; Mukhopadhyay, Susanta, "Texture segmentation from non-textural background using enhanced MTC", International Arab Journal of Information Technology, (16:4), 2019, pp. 737-745.
 - ❖ Raghuwanshi, Sanjeev Kumar; Kumar, Manish, "Highly dispersion tailored property of novel class of multimode surface plasmon resonance Biosensor assisted by teflon and metamaterial layers", IEEE Transactions on Instrumentation and Measurement, (68:8), 2019, pp. 2954-2963.
 - ❖ Raghuwanshi, Sanjeev Kumar; Pandey, Purnendu Shekhar, "Finite element method analysis of propagation in a non magnetic coupled waveguide structure having alpha-power refractive index profile", Indian Journal of Pure & Applied Physics, (57:3), 2019, pp. 188-195.

- ❖ Rahman, Kazi Hasibur; Kar, Asit Kumar, "Effect of precursor concentration of microstructured titanium-di-oxide (TiO₂) thin films and their photocatalytic activity", *Materials Research Express*, (6:9), 2019.
- ❖ Rai, Hari Mohan; Chatterjee, Kalyan, "Hybrid adaptive algorithm based on wavelet transform and independent component analysis for denoising of MRI images", *Measurement*, (144), 2019, pp. 72-82.
- ❖ Rai, Surabhi; Majee, Karunamay; Raj, Manaswini; Pahari, Asit; Patel, Jully; Padhi, Sumanta Kumar, "Electrocatalytic proton and water reduction by a Co(III) polypyridyl complex", *Polyhedron*, (159), 2019, pp. 127-134.
- ❖ Raina, Gaurav; Kannaboina, Prakash; Mupparapu, Nagaraju; Raina, Sushil; Ahmed, Qazi Naveed; Das, Parthasarathi, "Programmed synthesis of triaryl nitroimidazoles via sequential cross-coupling reactions", *Organic & Biomolecular Chemistry*, (17:8), 2019, pp. 2134-2147.
- ❖ Raj, Aditya; Gautam, Gunjan; Abdullah, Siti Norul Huda Sheikh; Zaini, Abbas Salimi; Mukhopadhyay, Susanta, "Multi-level thresholding based on differential evolution and Tsallis fuzzy entropy", *Image and Vision Computing*, (91), 2019.
- ❖ Raj, Deep, "Bioaccumulation of mercury, arsenic, cadmium, and lead in plants grown on coal mine soil", *Human And Ecological Risk Assessment*, (25:3), 2019, pp. 659-671.
- ❖ Raj, Deep; Kumar, Adarsh; Maiti, Subodh Kumar, "Evaluation of toxic metal(loid)s concentration in soils around an open-cast coal mine (Eastern India)", *Environmental Earth Sciences*, (78:22), 2019.
- ❖ Raj, Deep; Maiti, Subodh Kumar, "Bioaccumulation of potentially toxic elements in tree and vegetable species with associated health and ecological risks: a case study from a thermal power plant, Chandrapura, India", *Rendiconti Lincei-Scienze Fisiche E Naturali*, (30:3), 2019, pp. 649-665.
- ❖ Raj, Deep; Maiti, Subodh Kumar, "Sources, toxicity, and remediation of mercury: an essence review", *Environmental Monitoring and Assessment*, (191:9), 2019.
- ❖ Raj, Manaswini; Padhi, Sumanta Kumar, "Synthesis, characterization, and structure of quinoline-based benzimidazole derivatives", *Journal of Heterocyclic Chemistry*, (56:3), 2019, pp. 988-997.
- ❖ Raj, N. Mohan; Kumaraswamidhas, L. A.; Vendan, S. Arungalai; Nalajam, Pavan Kumar, "Investigations on resistance behavior at the interface of ultrasonically welded dissimilar Al/Cu Joints", *Silicon*, (11:4), 2019, pp. 1717-1723.
- ❖ Raj, Piush; Hloch, Sergej; Tripathi, Rupam; Srivastava, Madhulika; Nag, Akash; Klichova, Dagmar; Klich, Jiri; Hromasova, Monika; Muller, Miroslav; Miloslav, Linda; Chattopadhyaya, Somnath; Adamcik, Pavel, "Investigation of sandstone erosion by continuous and pulsed water jets", *Journal of Manufacturing Processes*, (42), 2019, pp. 121-130.
- ❖ Raja, S. Chidambara; Kumaraswamidhas, L. A.; Karthikeyan, P.; Ramu, M., "Prediction of pressure dependent effective thermal conductivity of two phase materials in high temperature applications-an analytical method using hexagon and octagon models", *International Journal of Thermal Sciences*, (135), 2019, pp. 192-205.
- ❖ Rajak, Dipen Kumar; Pagar, Durgesh D.; Menezes, Pradeep L.; Linul, Emanoil, "Fiber-reinforced polymer composites: manufacturing, properties, and applications", *Polymers*, (11:10), 2019.
- ❖ Rajak, Manindra; Shaw, Krishnendu, "Evaluation and selection of mobile health (mHealth) applications using AHP and fuzzy TOPSIS", *Technology in Society*, (59), 2019.
- ❖ Rajhans, Puja; Chand, Gaurav; Kisku, Nishikant; Panda, Sarat Kumar; Nayak, Sanket, "Proposed mix design method for producing sustainable self compacting

- heat cured recycled aggregate concrete and its microstructural investigation", *Construction and Building Materials*, (218), 2019, pp. 568-581.
- ❖ Rajhans, Puja; Gupta, Prashant Kumar; Kumar, Raju Ranjan; Panda, Sarat Kumar; Nayak, Sanket, "EMV mix design method for preparing sustainable self compacting recycled aggregate concrete subjected to chloride environment", *Construction and Building Materials*, (199), 2019, pp. 705-716.
 - ❖ Rajwar, Birendra Kumar; Sharma, Shailendra Kumar, "Structural, optical and electrical properties of Ag-doped SnS₂ nano-flowers synthesized by solvothermal method", *Materials Research Express*, (6:7), 2019.
 - ❖ Rakheja, Pankaj; Vig, Rekha; Singh, Phool; Kumar, Ravi, "An iris biometric protection scheme using 4D hyperchaotic system and modified equal modulus decomposition in hybrid multi resolution wavelet domain", *Optical and Quantum Electronics*, (51:6), 2019.
 - ❖ Rakshit, Rahul; Das, Alok Kumar, "A review on cutting of industrial ceramic materials", *Precision Engineering-Journal of the International Societies for Precision Engineering and Nanotechnology*, (59), 2019, pp. 90-109.
 - ❖ Rana, Kamlesh Kumar; Tripathi, Sachin; Raw, Ram Shringar, "Fuzzy logic-based directional location routing in vehicular Ad Hoc network", *Proceedings of the National Academy of Sciences India Section A-Physical Sciences*, 2019.
 - ❖ Rani, Komal; Guha, Arindam; Mondal, Subhendu; Pal, Sanjit Kumar; Kumar, K. Vinod, "ASTER multispectral bands, ground magnetic data, ground spectroscopy and space-based EIGEN6C4 gravity data model for identifying potential zones for gold sulphide mineralization in Bhukia, Rajasthan, India", *Journal of Applied Geophysics*, (160), 2019, pp. 28-46.
 - ❖ Rani, Komal; Guha, Arindam; Pal, Sanjit Kumar; Kumar, K. Vinod, "Potential use of ASTER derived emissivity, thermal inertia and albedo image for discriminating different rock types of Aravalli group of rocks, Rajasthan", *Journal of the Geological Society of India*, (94:6), 2019, pp. 583-589.
 - ❖ Rani, Radha; Jain, Manish Kumar, "Hydraulic transportation of coal combustion products for mine fill", *Particulate Science and Technology*, (37:1), 2019, pp. 123-129.
 - ❖ Rani, Rupa; Kumar, Vipin; Gupta, Pratishtha; Chandra, Avantika, "Effect of endosulfan tolerant bacterial isolates (*delftia lacustris* IITISM30 and *klebsiella aerogenes* IITISM42) with *helianthus annuus* on remediation of endosulfan from contaminated soil", *Ecotoxicology and Environmental Safety*, (168), 2019, pp. 315-323.
 - ❖ Rani, Rupa; Kumar, Vipin; Usmani, Zeba; Gupta, Pratishtha; Chandra, Avantika, "Influence of plant growth promoting rhizobacterial strains *paenibacillus* sp. IITISM08, *bacillus* sp. PRB77 and *bacillus* sp. PRB101 using *helianthus annuus* on degradation of endosulfan from contaminated soil", *Chemosphere*, (225), 2019, pp. 479-489.
 - ❖ Ranjan, Pinku; Gangwar, Ravi Kumar, "Probe feed multi-element multi-segment triangular dielectric resonator antenna with RCS analysis", *Journal of Circuits Systems and Computers*, (28:12), 2019.
 - ❖ Ranjan, Rajeev K.; Sinha, Ankita; Paul, Sajal K. "A new operational transconductance amplifier based pulse width modulator", *Proceedings of the National Academy of Sciences India Section A-Physical Sciences*, (89:1), 2019, pp. 51-55.
 - ❖ Ranjan, Rajeev Kumar; Sagar, Surendra; Roushan, Subrato; Kumari, Bharti; Rani, Nishtha; Khateb, Fabian, "High-frequency floating memristor emulator and its experimental results", *IET Circuits Devices & Systems*, (13:3), 2019, pp. 292-302.
 - ❖ Ranjan, Rajeev Kumar; Sharma, Pankaj Kumar; Sagar, Raj, Niranjan; Kumari, Bharti; Khateb, Fabian, "Memristor

- emulator circuit using multiple-output OTA and its experimental results", *Journal of Circuits Systems and Computers*, (28:10), 2019.
- ❖ Ranjan, Rajiv; Mallick, Ashis; Jana, Prasun, "Thermoelastic study of a functionally graded annular fin with variable thermal parameters using semiexact solution", *Journal of Thermal Stresses*, (42:10), 2019, pp. 1272-1297.
 - ❖ Ranjan, Rakesh; Ghosh, Subrata Kumar; Kumar, Manoj, "Modelling of wear debris in planetary gear drive", *Industrial Lubrication and Tribology*, (71:2), 2019, pp. 199-204.
 - ❖ Rao, G. Srinivasa; Arasada, R. C.; Sahoo, P. R.; Khan, Israil, "Integrated geophysical investigations in the Mudiyawas-Khera block of the Alwar basin of North Delhi Fold Belt (NDBF): implications on copper and associated mineralisation", *Journal of Earth System Science*, (128:6), 2019.
 - ❖ Rao, P. S.; Rahul, A. K., "Combined effect of viscosity variation and non-Newtonian Rabinowitsch fluid in wide parallel rectangular-porous plate with squeeze-film characteristics", *Meccanica*, (54:15), 2019, pp. 2399-2409.
 - ❖ Rao, Pentyala Srinivasa; Murmu, Birendra; Agarwal, Santosh, "A comparison of porous structures on the performance of slider bearing with surface roughness in micropolar fluid film lubrication", *Thermal Science*, (23:3), 2019, pp. 1813-1824.
 - ❖ Rao, Pentyala Srinivasa; Rahul, Amit Kumar, "Pressure generation in rough conical bearing using non-Newtonian Rabinowitsch fluid with variable viscosity", *Industrial Lubrication and Tribology*, (71:3), 2019, pp. 357-365.
 - ❖ Rao, Pentyala Srinivasa; Rahul, Amit Kumar, "Effect of viscosity variation on non-Newtonian lubrication of squeeze film conical bearing having porous wall operating with Rabinowitsch fluid model", *Proceedings of the Institution of Mechanical Engineers Part C-Journal of Mechanical Engineering Science*, (233:7), 2019, pp. 2538-2551.
 - ❖ Rao, Shiva Dayal B.; Sethi, Abhijeet; Das, Alok Kumar, "Fiber laser processing of GFRP composites and multi-objective optimization of the process using response surface methodology", *Journal of Composite Materials*, (53:11), 2019, pp. 1459-1473.
 - ❖ Ravi, Banoth; Thangaraj, Jaisingh; Petale, Shrinivas, "Data traffic forwarding for inter-vehicular communication in VANETs using stochastic method", *Wireless Personal Communications*, (106:3), 2019, pp. 1591-1607.
 - ❖ Rawat, P.; Singh, K. K.; Singh, N. K.; Tiwari, K.; Sharma, A., "Optimizing weight percentage of MWCNTs for enhancing LVI resistance of quasi-isotropic symmetric laminate of carbon woven fabric/epoxy embedded with MWCNTs", *Experimental Techniques*, (43:6), 2019, pp. 719-728.
 - ❖ Ray, Anusree; Singh, Abhishek K., "Love-type waves in couple-stress stratum imperfectly bonded to an irregular viscous substrate", *Acta Mechanica*, 2019.
 - ❖ Ray, Anusree; Singh, Abhishek K.; Kumari, Richa, "Green's function technique to model love-type wave propagation due to an impulsive point source in a piezomagnetic layered structure", *Mechanics of Advanced Materials and Structures*, 2019.
 - ❖ Ray, Shakti S.; Sahoo, Smruti R.; Sahu, Sridhar, "Hydrogen storage in scandium doped small boron clusters (BnSc2, n=3-10): a density functional study", *International Journal of Hydrogen Energy*, (44:12), 2019, pp. 6019-6030.
 - ❖ Reddy, B. Naresh Kumar; Ramalingaswamy, Ch.; Nagulapalli, R.; Ramesh, Dharavath, "A novel 8T SRAM with improved cell density", *Analog Integrated Circuits and Signal Processing*, (98:2), 2019, pp. 357-366.
 - ❖ Rizvi, Naela; Ramesh, Dharavath, "FBQ-LA: fuzzy based Q-Learning approach for elastic workloads in cloud environment", *Journal of Intelligent & Fuzzy Systems*, (36:3), 2019, pp. 2715-2728.

Research, Development, Innovation & Entrepreneurship

- ❖ Routa, Alok Kumar; Mohanty, P. R., "Seismic imaging of subsurface geological structures by Kirchhoff's migration based on extended Born approximation", *Journal of Earth System Science*, (129:1), 2019.
- ❖ Roy, Arpita; Maity, Priti Prasanna; Bose, Anirbandeep; Dhara, Santanu; Pal, Sagar, "beta-Cyclodextrin based pH and thermo-responsive biopolymeric hydrogel as a dual drug carrier", *Materials Chemistry Frontiers*, (3:3), 2019, pp. 385-393.
- ❖ Roy, Biplab Kumar; Mandal, Amitava, "Surface integrity analysis of Nitinol-60 shape memory alloy in WEDM", *Materials and Manufacturing Processes*, (34:10), 2019, pp. 1091-1102.
- ❖ Roy, Debananda; Singh, Gurdeep; Seo, Yong-Chil, "Carcinogenic and non-carcinogenic risks from PM10-and PM2.5-bound metals in a critically polluted coal mining area", *Atmospheric Pollution Research*, (10:6), 2019, pp. 1964-1975.
- ❖ Roy, Debananda; Singh, Gurdeep; Seo, Yong-Chil, "Coal mine fire effects on carcinogenicity and non-carcinogenicity human health risks", *Environmental Pollution*, (254), 2019.
- ❖ Roy, Dhrubojyoti; Chakraborty, Mohua; Gupta, P. S., "Annealing provoked modification of ZnPc photoactive nanolayer via self-assembling at SnO₂ hybrid interface and its effect on layer electric properties towards application in hybrid photovoltaic devices", *Applied Surface Science*, (490), 2019, pp. 492-501.
- ❖ Roy, Gunjan Mittal; Kanaujia, Binod Kumar; Dwari, Santanu; Kumar, Sandeep; Song, Hanjung, "Investigation of CMOS based integration approach using DAI technique for next generation wireless networks", *Wireless Personal Communications*, (104:3), 2019, pp. 1091-1107.
- ❖ Roy, Nishant; Sarkar, Rajib; Bharti, Shiv Dayal, "Relative influence of strength and geometric parameters on the behavior of jointed rock slopes", *Arabian Journal of Geosciences*, (12:20), 2019.
- ❖ Roy, Soumitra; Pal, Arup Kumar, "A hybrid domain color image watermarking based on DWT-SVD", *Iranian Journal of Science and Technology-Transactions of Electrical Engineering*, (43:2), 2019, pp. 201-217.
- ❖ Roy, Tapas; Sadhu, Pradip Kumar; Dasgupta, Abhijit, "Cross-switched multilevel inverter using novel switched capacitor converters", *IEEE Transactions on Industrial Electronics*, (66:11), 2019, pp. 8521-8532.
- ❖ Rudolf, Rebeka; Fercec, Urban; Shariq, Mohammed, "Fireworks: how to simulate the manufacture and operation in the atmosphere with the substitution of ultrasonic spray pyrolysis", *Current Nanoscience*, (15:2), 2019, pp. 147-156.
- ❖ Sabapathy, Raja; Paul, Partha Sarathi; Mandal, Prabhat Kumar, "Evaluation of bump-proneness of underground coal mines using burst energy coefficient", *Arabian Journal of Geosciences*, (12:18), 2019.
- ❖ Saha, Amal Krishna; Sinha, Alok; Pasupuleti, Srinivas, "Modification, characterization and investigations of key factors controlling the transport of modified nano zero-valent iron (nZVI) in porous media", *Environmental Technology*, (40:12), 2019, pp. 543-1556.
- ❖ Saha, Anup; Kundu, Santimoy; Gupta, Shishir; Vaishnav, Pramod Kumar, "Effect of irregularity on torsional surface waves in an initially stressed porous layer sandwiched between two non-homogeneous half-spaces", *Proceedings of the National Academy of Sciences India Section A-Physical Sciences*, (89:1), 2019, pp. 171-183.
- ❖ Saha, Gokul; Rai, S. S.; Shalivahan, "Occurrence of diamond in peninsular India and its relationship with deep Earth seismic properties", *Journal of Earth System Science*, (128:3), 2019.
- ❖ Saha, Priti; Paul, Biswajit, "Groundwater quality assessment in an industrial hotspot through interdisciplinary techniques",

- Environmental Monitoring and Assessment, (191), 2019.
- ❖ Saha, Priti; Paul, Biswajit, "Assessment of heavy metal toxicity related with human health risk in the surface water of an industrialized area by a novel technique", Human and Ecological Risk Assessment, (25:4), 2019, pp. 966-987.
 - ❖ Saha, Shalini; Chattopadhyay, Amares; Singh, Abhishek Kumar, "Numerical modelling of SH-wave propagation in initially-stressed multilayered composite structures: a casewise study", Engineering Computations, (36:1), 2019, pp. 271-306.
 - ❖ Saha, Shalini; Singh, Abhishek Kumar; Chattopadhyay, Amares, "Impact of curved boundary on the propagation characteristics of Rayleigh-type wave and SH-wave in a prestressed monoclinic media", Mechanics of Advanced Materials and Structures, 2019.
 - ❖ Saha, Shalini; Singh, Abhishek Kumar; Chattopadhyay, Amares, "On propagation behavior of SH-wave and Rayleigh-type wave in an initially stressed exponentially graded fiber-reinforced viscoelastic layered structure", Waves in Random and Complex Media, 2019.
 - ❖ Saha, Sirshendu; Bera, Saikat Kumar; Mandal, Hiranmoy; Sadhu, Pradip Kumar; Bera, Satish Chandra, "Study of an accurate electronic power measurement technique using modified current transformer and potential transformer", Transactions of the Institute of Measurement and Control, (41:13), 2019, pp. 3666-3678.
 - ❖ Saha, Sirshendu; Bera, Saikat Kumar; Mandal, Hiranmoy; Sadhu, Pradip Kumar; Bera, Satish Chandra, "A temperature compensated non-contact pressure transducer using hall sensor and bourdon tube", IEEE Sensors Journal, (19:14), 2019, pp. 5429-5438.
 - ❖ Saha, Subhodip; Mukherjee, Vivekananda, "A novel multiobjective chaotic symbiotic organisms search algorithm to solve optimal DG allocation problem in radial distribution system", International Transactions on Electrical Energy Systems, (29:5), 2019.
 - ❖ Saha, Sukla; Saha, Priti; Sinha, Alok, "Assessment of hazard on human health and aquatic life in acid mine drainage treated with novel technique", Human and Ecological Risk Assessment, (25:8), 2019, pp. 1925-1941.
 - ❖ Saha, Sukla; Sarkar, Sayantan; Sinha, Alok, "Use of basic oxygen furnace (BOF) steel slag for acid mine drainage treatment: a laboratory study", Mine Water and the Environment, (38:3), 2019, pp. 517-527.
 - ❖ Sahadevan, Dinesh Kumar; Pandey, Anand Kumar; Malik, Kapil; Maisnam, Devika, "Chasm at east African Suswa rift: possible explanations", Journal of the Indian Society of Remote Sensing, (47:10), 2019, pp. 1773-1780.
 - ❖ Sahay, Suman; Pandey, Mukesh Kumar; Kar, Asit Kumar, "Metal concentration dependent mechanical properties of electrodeposited nickel incorporated diamond like carbon (Ni-DLC) thin films studied by nanoindentation", Applied Surface Science, (489), 2019, pp. 73-79.
 - ❖ Sahoo, Karunakar; Mohanty, Biswajyoti; Nayak, Jhasaketan, "Enhanced photoresponse characteristics of ZnO polymer nanocomposite: effect of variation of surface density of nanocrystals", Journal of Materials Science-Materials in Electronics, (30:21), 2019, pp. 19664-19674.
 - ❖ Sahoo, Monica; Bhowmick, Trisrota; Mishra, Vivek; Pal, Sudip; Sharma, Mamta; Chakravarty, Sanchita, "Significance of coal quality on thermoplastic properties: a case study", International Journal of Coal Preparation and Utilization, 2019.
 - ❖ Sahoo, Pooja; Sharma, Akash; Padhan, Subash; Udayabhanu, G.; Thangavel, R., "UV-assisted water splitting of stable Cl-doped ZnO nanorod photoanodes grown via facile sol-gel hydrothermal technique for enhanced solar energy harvesting applications", Solar Energy, (193), 2019, pp. 148-163.

Research, Development, Innovation & Entrepreneurship

- ❖ Sahoo, Saroj Kumar; Suresh, Nikkam; Varma, Atul Kumar, "Kinetic studies on petrographic components of coal in batch flotation operation", *International Journal of Coal Preparation and Utilization*, (39:5), 2019, pp. 259-280.
- ❖ Sahoo, Saroj Kumar; Suresh, Nikkam; Varma, Atul Kumar, "Performance evaluation of basic flotation kinetic models using advanced statistical techniques", *International Journal of Coal Preparation and Utilization*, (39:2), 2019, pp. 65-87.
- ❖ Sahoo, Soumyashree Debasis; Pal, S. K., "Mapping of structural lineaments and fracture zones around the central Indian ridge (10 degrees S-21 degrees S) using EIGEN 6C4 Bouguer gravity data", *Journal of the Geological Society of India*, (94:4), 2019, pp. 359-366.
- ❖ Sahoo, Subhendu Sekhar; Chatterjee, Kalyan; Tripathi, P. M., "A coordinated control strategy using supercapacitor energy storage and series dynamic resistor for enhancement of fault ride-through of doubly fed induction generator", *International Journal of Green Energy*, (16:8), 2019, pp. 615-626.
- ❖ Sahoo, Subhendu Sekhar; Tripathi, P. M.; Chatterjee, Kalyan, "Low-cost non-superconducting DC-fault current limiter for the enhancement of low-voltage ride through capability of doubly fed induction generator", *IETE Technical Review*, 2019.
- ❖ Sahoo, Subhendu Sekhar; Tripathi, Prashant Mani; Chatterjee, Kalyan, "Effectiveness evaluation of passive resistive element placement on a fault ride-through enhancement in a DFIG-based wind energy conversion system", *Wind Energy*, (23:3), 2020, pp. 825-848.
- ❖ Sahu, Dejalini; Chaurasia, Ram Chandra; Suresh, Nikkam, "Mineralogical characterization and washability of Indian coal from Jamadoba", *Energy Sources Part A-Recovery Utilization and Environmental Effects*, (41:5), 2019, pp. 517-526.
- ❖ Sahu, Keya; Kar, Asit Kumar, "Morphological, optical, photocatalytic and electrochemical properties of hydrothermally grown ZnO nanoflowers with variation in hydrothermal temperature", *Materials Science in Semiconductor Processing*, (104), 2019.
- ❖ Sahu, Keya; Rahamn, Kazi Hasibur; Kar, Asit Kumar, "Synergic effect of polyaniline and ZnO to enhance the photocatalytic activity of their nanocomposite", *Materials Research Express*, (6:9), 2019.
- ❖ Sahu, L.; Bhattacharya, S.; Dey, S., "Release analysis of coal fines: evolution of the methodology and critical issues involved", *Journal of the Southern African Institute of Mining and Metallurgy*, (119:6), 2019, pp. 595-606.
- ❖ Sahu, Sanjeev A.; Baroi, Juhi, "Analysis of surface wave behavior in corrugated piezomagnetic layer resting on inhomogeneous half-space", *Mechanics of Advanced Materials and Structures*, (26:7), 2019, pp. 639-650.
- ❖ Sahu, Sanjeev A.; Kumari, Shreeta; Mondal, Sonali; Pankaj, Kamlesh K., "Analysis of mechanical vibration (SH wave) in Piezo-composite plates", *Materials Research Express*, (6:12), 2019.
- ❖ Sahu, Sanjeev A.; Mondal, Sonali; Dewangan, Nidhi, "Polarized shear waves in functionally graded piezoelectric material layer sandwiched between corrugated piezomagnetic layer and elastic substrate", *Journal of Sandwich Structures & Materials*, (21:8), 2019, pp. 2921-2948.
- ❖ Sahu, Sanjeev A.; Pankaj, Kamlesh K.; Kumari, Shreeta, "Modeling of SH-wave propagation in a pre-stressed highly anisotropic layered structure", *Mathematical Geosciences*, (51:4), 2019, pp. 419-436.
- ❖ Sahu, Sanjeev Anand; Baroi, Juhi; Chattopadhyay, A.; Nirwal, Sonal, "Characterization of polarized shear waves in FGPM composite structure with imperfect boundary: WKB method", *International Journal of Applied Mechanics*, (11:9), 2019.
- ❖ Sahu, Sanjeev Anand; Chaudhary, Soniya; Paswan, Brijendra, "Scattering

- phenomenon of qP wave at the interface of FGPM and piezoelectric medium", *Waves in Random and Complex Media*, (29:3), 2019, pp. 435-455.
- ❖ Saikia, Sowrav; Baruah, Santanu; Chopra, Sumer; Gogoi, Bibhuti; Singh, Upendra K.; Bharali, Bubul, "An appraisal of crustal structure of the Indo-Burmese subduction region", *Journal of Geodynamics*, (127), 2019, pp. 16-30.
 - ❖ Sakshi; Swain, Bikash Chandra; Das, Anand Kant; Tripathy, Umakanta, "Probing third-order nonlinearity in serotonin: a Z-scan study", *Spectrochimica Acta Part A-Molecular and Biomolecular Spectroscopy*, (223), 2019.
 - ❖ Salgotra, Aprajita; Pan, Somnath, "A frequency domain model-based design of PSS and TCSC controller for damping the small signal oscillations in the power system", *International Transactions on Electrical Energy Systems*, (29:3), 2019.
 - ❖ Salum, Amiri Hamis; Murthy, V. M. S. R., "Optimising blast pulls and controlling blast-induced excavation damage zone in tunnelling through varied rock classes", *Tunnelling and Underground Space Technology*, (85), 2019, pp. 307-318.
 - ❖ Samui, Arpita; Chowdhuri, Angshuman Ray; Sahu, Sumanta Kumar, "Lipase immobilized metal-organic frameworks as remarkably biocatalyst for ester hydrolysis: a one step approach for lipase immobilization", *Chemistryselect*, (4:13), 2019, pp. 3745-3751.
 - ❖ Samui, Arpita; Pal, Kunal; Karmakar, Parimal; Sahu, Sumanta Kumar, "In situ synthesized lactobionic acid conjugated NMOFs, a smart material for imaging and targeted drug delivery in hepatocellular carcinoma", *Materials Science & Engineering C-Materials for Biological Applications*, (98), 2019, pp. 772-781.
 - ❖ Sandupatla, Aditya Shankar; Nayak, Sudhir Charan; Sivananda, Chalumuri; Deo, Goutam, "DFT investigation into the experimentally observed influence of oxide support in the ODH of propane over supported vanadia catalysts", *Catalysis Today*, (325), 2019, pp. 18-24.
 - ❖ Sani, Md Muzammil; Chowdhury, Rakesh; Chaudhary, Raghvendra Kumar, "Hybrid wideband dual-cylindrical circularly polarized dielectric resonator antennas excited with S-shaped microstrip feed for sub-6 GHz frequency range", *International Journal of RF and Microwave Computer-Aided Engineering*, (30:2), 2020.
 - ❖ Sani, Md Muzammil; Chowdhury, Rakesh; Chaudhary, Raghvendra Kumar, "Electrically coupled dual semicylindrical dielectric resonator antenna with inverted arrangement for wideband applications", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:11), 2019.
 - ❖ Sanjid, M. Arif; Yadav, Sanjay; Sen, Mrinal; Ghoshal, Sanjoy K., "A review of diameter measurement and a proposal for the improvement thereof", *Mapan-Journal of Metrology Society of India*, 2019.
 - ❖ Sanjid, Mahammed Arif; Ghoshal, Sanjoy K.; Sen, Mrinal, "Reviving the inter-laboratory comparison measurement results", *Transactions of the Institute of Measurement and Control*, (42:4), 2020, pp. 823-831.
 - ❖ Santosh, R.; Kumar, V., "The structural, electronic, optical and thermodynamical properties of hydrofluorinated graphene: first-principle calculations", *Solid State Sciences*, (94), 2019, pp. 70-76.
 - ❖ Santosh, R.; Kumar, V., "Structural, electronic, optical, and thermodynamic properties of hydrochlorinated janus graphene: a first-principle study", *Journal of Molecular Modeling*, (25:9), 2019.
 - ❖ Santosh, R.; Kumar, V., "The effect of pressure on the electronic and optical properties of hydrogenated graphene: a first-principles study", *Journal of Computational Electronics*, (18:3), 2019, pp. 770-778.
 - ❖ Sapre, Shitanshu; Pareek, Kapil; Rohan, Rupesh; Singh, Pawan Kumar, "H-2 refueling assessment of composite storage

- tank for fuel cell vehicle", *International Journal of Hydrogen Energy*, (44:42), 2019, pp. 23699-23707.
- ❖ Sardana, Sahil; Verma, A. K.; Singh, Anand; Laldinpuia, "Comparative analysis of rockmass characterization techniques for the stability prediction of road cut slopes along NH-44A, Mizoram, India", *Bulletin of Engineering Geology and the Environment*, (78:8), 2019, pp. 5977-5989.
 - ❖ Sardana, Sahil; Verma, A. K.; Verma, Rahul; Singh, T. N., "Rock slope stability along road cut of Kulikawn to Saikhamakawn of Aizawl, Mizoram, India", *Natural Hazards*, (99:2), 2019, pp. 753-767.
 - ❖ Saren, Pupulata; De Adhikari, Amrita; Khan, Sudipta; Nayak, Ganesh Chandra, "Self-assembled GNS wrapped flower-like MnCo₂O₄ nanostructures for supercapacitor application", *Journal of Solid State Chemistry*, (271), 2019, pp. 282-291.
 - ❖ Sarkar, Arijit; Gomez-Garcia, Carlos J.; Benmansour, Samia; Nayek, Hari Pada, "Trinuclear lanthanide coordination clusters: single-molecule-magnet behavior and catalytic activity in the Friedel-Crafts alkylation reaction", *Chempluschem*, (84:7), 2019, pp. 974-980.
 - ❖ Sarkar, Arpan; Ranjan, Ashish; Paul, Biswajit, "Synthesis, characterization and application of surface-modified biochar synthesized from rice husk, an agro-industrial waste for the removal of hexavalent chromium from drinking water at near-neutral pH", *Clean Technologies and Environmental Policy*, (21:2), 2019, pp. 447-462.
 - ❖ Sarkar, Arpan; Sarkar, Ayan; Paul, Biswajit; Khan, Gobinda Gopal, "Designing of functionalized MWCNTs/anodized stainless steel heterostructure electrode for anodic oxidation of low concentration As(III) in drinking water", *Chemistryselect*, (4:32), 2019, pp. 9367-9375.
 - ❖ Sarkar, Chandrani; Chowdhuri, Angshuman Ray; Garai, Subhadra; Chakraborty, Jui; Sahu, Sumanta Kumar, "Three-dimensional cellulose-hydroxyapatite nanocomposite enriched with dexamethasone loaded metal-organic framework: a local drug delivery system for bone tissue engineering", *Cellulose*, (26:12), 2019, pp. 7253-7269.
 - ❖ Sarkar, Chandrani; Sahu, Sumanta Kumar; Sinha, Arvind; Chakraborty, Jui; Garai, Subhadra, "Facile synthesis of carbon fiber reinforced polymer-hydroxyapatite ternary composite: a mechanically strong bioactive bone graft", *Materials Science & Engineering C-Materials for Biological Applications*, (97), 2019, pp. 388-396.
 - ❖ Sarkar, Debayan; Kumar, Anand; Sadhu, Pradip Kumar, "A survey on development and recent trends of renewable energy generation from BIPV systems", *IETE Technical Review*, 2019.
 - ❖ Sarkar, Jit; Das, D. K., "Enhanced strength in novel nanocomposites prepared by reinforcing graphene in red soil and fly ash bricks", *International Journal of Minerals Metallurgy and Materials*, (26:10), 2019, pp. 1322-1328.
 - ❖ Sarkar, Manas; Mishra, Shivangi; Daniel, Anitha; Dwari, Santanu, "Design of a variable depth axially corrugated horn antenna at X-band for low cross-polarization applications", *Wireless Personal Communications*, (108:1), 2019, pp. 269-280.
 - ❖ Saroj, Pradeep Kumar; Sahu, Sanjeev A.; Singhal, Abhinav; Abo-Dahab, S. M., "On the transference of Love-type waves in pre-stressed PZT-5H material stick on SiO₂ material with irregularity", *Materials Research Express*, (6:12), 2019.
 - ❖ Satyanarayana, Inumula; Budi, G., "Analytical and numerical approach for analysis of factors affecting pit slope stability at Dorli OCP-II, India", *Journal of Mining Science*, (55:3), 2019, pp. 376-382.
 - ❖ Saxena, Neha; Goswami, Abhishek; Dhodapkar, P. K.; Nihalani, M. C.; Mandal, Ajay, "Bio-based surfactant for enhanced oil recovery: interfacial properties, emulsification and rock-fluid

- interactions", *Journal of Petroleum Science and Engineering*, (176), 2019, pp. 299-311.
- ❖ Saxena, Neha; Kumar, Amit; Mandal, Ajay, "Adsorption analysis of natural anionic surfactant for enhanced oil recovery: the role of mineralogy, salinity, alkalinity and nanoparticles", *Journal of Petroleum Science and Engineering*, (173), 2019, pp. 1264-1283.
 - ❖ Saxena, Neha; Saxena, Amit; Mandal, Ajay, "Synthesis, characterization and enhanced oil recovery potential analysis through simulation of a natural anionic surfactant", *Journal of Molecular Liquids*, (282), 2019, pp. 545-556.
 - ❖ Saxena, Richa; Ghoshal, Sanjoy K.; Kumar, Harish, "Design investigations of axis-symmetrical force transducers", *Mapan-Journal of Metrology Society of India*, (34:4), 2019, pp. 511-519.
 - ❖ Saxena, Richa; Ghoshal, Sanjoy; Kumar, Harish, "A critical assessment of simple shaped force transducers: design and metrological considerations", *Indian Journal of Pure & Applied Physics*, (57:1), 2019, pp. 42-51.
 - ❖ Saxena, Vishal; Kumar, Niraj; Saxena, Vinod Kumar, "Multi-objective optimization of modified nanofluid fuel blends at different TiO₂ nanoparticle concentration in diesel engine: experimental assessment and modeling", *Applied Energy*, (248), 2019, pp. 330-353.
 - ❖ Scarf, Phil; Parma, Rishikesh; McHale, Ian, "On outcome uncertainty and scoring rates in sport: the case of international rugby union", *European Journal of Operational Research*, (273:2), 2019, pp. 721-730.
 - ❖ Senapati, Manoj Kumar; Pradhan, Chittaranjan; Nayak, Paresh Kumar; Samantaray, Subhansu Ranjan, "Lagrange interpolating polynomial-based deloading control scheme for variable speed wind turbines", *International Transactions on Electrical Energy Systems*, (29:5), 2019.
 - ❖ Senapati, Manoj Kumar; Pradhan, Chittaranjan; Samantaray, Subhansu Ranjan; Nayak, Paresh K., "Improved power management control strategy for renewable energy-based DC micro-grid with energy storage integration", *IET Generation Transmission & Distribution*, (13:6), 2019, pp. 838-849.
 - ❖ Sengar, Sandeep Singh; Mukhopadhyay, Susanta, "Motion segmentation-based surveillance video compression using adaptive particle swarm optimization", *Neural Computing & Applications*, 2019.
 - ❖ Sengupta, Arijit; Ethirajan, Sudheesh Kumar; Kamaz, Mohanad; Jebur, Mahmood; Wickramasinghe, Ranil, "Synthesis and characterization of antibacterial poly ionic liquid membranes with tunable performance", *Separation and Purification Technology*, (212), 2019, pp. 307-315.
 - ❖ Seth, G. S.; Bhattacharyya, A.; Kumar, R.; Mishra, M. K., "Modeling and numerical simulation of hydromagnetic natural convection casson fluid flow with Nth-order chemical reaction and Newtonian heating in porous medium", *Journal of Porous Media*, (22:9), 2019, pp. 1141-1157.
 - ❖ Seth, G. S.; Mandal, P. K., "Analysis of electromagnetohydrodynamic stagnation point flow of nanofluid over a nonlinear stretching sheet with variable thickness", *Journal of Mechanics*, (35:5), 2019, pp. 719-733.
 - ❖ Shamim, Sk; Khan, Prosanta Kumar; Mohanty, Sarada P., "Stress reconstruction and lithosphere dynamics along the Sumatra subduction margin", *Journal of Asian Earth Sciences*, (170), 2019, pp. 174-187.
 - ❖ Shan, Houxiang; Zhai, Mingguo; Dey, Sukanta; Lu, Xiaoping, "Geochronological and geochemical studies on the granitoid gneisses in the northeastern north China craton: insights into the late neoproterozoic magmatism and crustal evolution", *Precambrian Research*, (320), 2019, pp. 371-390.
 - ❖ Shankar, Ravi; Kumar, Ashiwani; Raj, Utkarsh; Chatterjee, Kalyan, "Fruit fly

- algorithm-based automatic generation control of multiarea interconnected power system with FACTS and AC/DC links in deregulated power environment", *International Transactions on Electrical Energy Systems*, (29:1), 2019.
- ❖ Shankar, Sachindra; Vilaca, Pedro; Dash, Priyabrat; Chattopadhyaya, Somnath; Hloch, Sergej, "Joint strength evaluation of friction stir welded Al-Cu dissimilar alloys", *Measurement*, (146), 2019, pp. 892-902.
 - ❖ Shankar, V.; Kumar, D.; Subrahmanyam, Ds. "Impact and severity of deep excavations on stress tensors in mining", *Journal of Mining Science*, (55:2), 2019, pp. 213-218.
 - ❖ Sharma, Abhishek; Mishra, A. K.; Choudhary, B. S.; Meena, Rohit, "Impact of blast design parameters on rock fragmentation in building stone quarries", *Current Science*, (116:11), 2019, pp. 1861-1867.
 - ❖ Sharma, Anand; Tripathi, Devendra Kumar; Das, Gourab; Gangwar, Ravi Kumar, "Novel asymmetrical Swastik-shaped aperture coupled cylindrical dielectric resonator antenna with dual-band and dual-sense circular polarization characteristics", *Microwave and Optical Technology Letters*, (61:2), 2019, pp. 405-411.
 - ❖ Sharma, Anand; Tripathi, Devendra Kumar; Das, Gourab; Gangwar, Ravi Kumar; Ranjan, Pinku, "Compact dual polarised CDRA with stimulation of triple radiating mode", *International Journal of Electronics*, (107:1), 2020, pp. 46-59.
 - ❖ Sharma, Ankit; Gangwar, Deepak; Kanaujia, Binod Kumar; Dwari, Santanu, "Analysis and design of an ultra-thin metamaterial absorber and its application for in-band RCS reduction of antenna", *Journal of Electromagnetic Waves and Applications*, (33:5), 2019, pp. 654-667.
 - ❖ Sharma, Ankit; Gangwar, Deepak; Kanaujia, Binod Kumar; Dwari, Santanu, "Gain enhancement and RCS reduction of CP patch antenna using partially reflecting and absorbing metasurface", *Electromagnetics*, (39:2), 2019, pp.120-135.
 - ❖ Sharma, Ankit; Gangwar, Deepak; Kanaujia, Binod Kumar; Dwari, Santanu; Kumar, Sachin, "Design of a wideband polarisation conversion metasurface and its application for RCS reduction and gain enhancement of a circularly polarised antenna", *IET Microwaves Antennas & Propagation*, (13:9), 2019, pp. 1427-1437.
 - ❖ Sharma, N.; Hooda, M.; Sharma, S. K., "Stresses in thin films: an experimental study", *Indian Journal of Physics*, (93:2), 2019, pp. 159-167.
 - ❖ Sharma, Namarta; Behura, A. K., "Devotion, knowledge and service: Gandhi's interpretation of the Gita", *Journal of Dharma*, (44:4), 2019, pp. 405-426.
 - ❖ Sharma, Pankaj; Chattopadhyaya, Somnath; Singh, N. K., "A review on magnetically supported gas metal arc welding process for magnesium alloys", *Materials Research Express*, (6:8), 2019.
 - ❖ Sharma, Pankaj; Chattopadhyaya, Somnath; Singh, Nirmal Kumar, "Optimization of gas metal arc welding parameters to weld AZ31B alloy using response surface methodology", *Materials Research Express*, (6:10), 2019.
 - ❖ Sharma, Rohit; Deka, Barasha; Mahto, Vikas; Vuthaluru, Hari; Li, Chun-Zhu, "Investigation into the flow assurance of waxy crude oil by application of graphene-based novel nanocomposite pour point depressants", *Energy & Fuels*, (33:12), 2019, pp. 12330-12345.
 - ❖ Sharma, Rohit; Deka, Barasha; Mandal, Arnab; Mahto, Vikas, "Study the influence of sodium dodecyl sulfate on emulsification of heavy and waxy crude oils to improve their flow ability in low temperature conditions", *Asia-Pacific Journal of Chemical Engineering*, (14:1), 2019.

- ❖ Sharma, Rohit; Mahto, Vikas; Vuthaluru, Hari, "Synthesis of PMMA/modified graphene oxide nanocomposite pour point depressant and its effect on the flow properties of Indian waxy crude oil", *Fuel*, (235), 2019, pp. 1245-1259.
- ❖ Sharma, Shonam; Singh, Prasoon Kumar, "Spatial trends in rainfall seasonality: a case study in Jharkhand, India", *Weather*, (74:1), 2019, pp. 31-39.
- ❖ Sharma, Usha; Maheshkar, Sushila; Mishra, A. N.; Kaushik, Rahul, "Visual speech recognition using optical flow and hidden Markov model", *Wireless Personal Communications*, (106:4), 2019, pp. 2129-2147.
- ❖ Shaw, Krishnendu, "Implementing sustainability in global supply chain", *Problemy Ekorozwoju*, (14:2), 2019, pp. 117-127.
- ❖ Shaw, Parinita; Obot, I. B.; Yadav, M., "Functionalized 2-hydrazinobenzothiazole with carbohydrates as a corrosion inhibitor: electrochemical, XPS, DFT and monte carlo simulation studies", *Materials Chemistry Frontiers*, (3:5), 2019, pp. 931-940.
- ❖ Shrivastav, Alok Kumar; Sadhu, Pradip Kumar; Ganguly, Ankur, "Stability and harmonic analysis of a transient current limiter in distribution system", *Microsystem Technologies-Micro-and Nanosystems-Information Storage and Processing Systems*, (25:5), 2019, pp. 1833-1839.
- ❖ Shrivastava, Prakhar; Surendra, Sagar; Ranjan, Rajeev Kumar; Shrivastav, Abhishek; Priyadarshini, Bindu, "PI, PD and PID controllers using single DVCCTA", *Iranian Journal of Science and Technology-Transactions of Electrical Engineering*, (43:3), 2019, pp. 673-685.
- ❖ Shrivastava, Ruchir; Singh, K. K., "Interlaminar fracture toughness characterization of laminated composites: a review", *Polymer Reviews*, 2019.
- ❖ Shukla, Darpan; Venugopal, R., "Optimization of the process parameters for fine coal-oil agglomeration process using waste mustard oil", *Powder Technology*, (346), 2019, pp. 316-325.
- ❖ Siddique, Anusha Roohi; Mohanty, Shalini; Das, Alok Kumar, "Micro-electrical discharge coating of titanium alloy using WS₂ and Brass P/M electrode", *Materials and Manufacturing Processes*, 2019.
- ❖ Sikder, Partha Sarothi; Pal, Nitai, "Feasibility assessment of distributed generation systems in Sagar island, West Bengal, India", *Current Science*, (116:8), 2019, pp. 1381-1386.
- ❖ Sikder, Partha Sarothi; Pal, Nitai; Patro, Kota Sunil, "A modeling of stand-alone solar photo-voltaic system for rural electrification purposes", *Revue Roumaine Des Sciences Techniques-Serie Electrotechnique ET Energetique*, (64:3), 2019, pp. 241-246.
- ❖ Sing, Piyush Pratap; Azam, Mohammad Sikandar; Ranjan, Vinayak, "Size-dependent natural frequencies of functionally graded plate with out of plane material inhomogeneity using Eringen's theory of nonlocal elasticity", *Proceedings of the Institution of Mechanical Engineers Part L-Journal of Materials-Design and Applications*, (234:2), 2020, pp. 300-319.
- ❖ Singh, A. K.; Pal, M. K.; Negi, A.; Mistri, K. Ch, "Analytical study on dynamic response due to a moving load on distinctly characterized orthotropic half-spaces under different physical conditions with comparative approach", *Arabian Journal for Science and Engineering*, (44:5), 2019, pp. 4863-4883.
- ❖ Singh, A. P.; Ghoshal, S. K.; Kumar, H., "Development and metrological evaluation of an industrial force transducer", *Mapan-Journal of Metrology Society of India*, 2019.
- ❖ Singh, Abhishek K.; Kumari, Richa; Ray, Anusree; Chattopadhyay, Amares, "Love-type waves in a piezoelectric-viscoelastic bimaterial composite structure due to an impulsive point source", *International*

- Journal of Mechanical Sciences, (152), 2019, pp. 613-629.
- ❖ Singh, Abhishek K.; Negi, Anil; Koley, Siddhartha, "Influence of surface irregularity on dynamic response induced due to a moving load on functionally graded piezoelectric material substrate", Smart Structures and Systems, (23:1), 2019, pp. 31-44.
 - ❖ Singh, Abhishek Kumar; Agarwalla, Shubham; Chaki, Mriganka Shekhar; Chattopadhyay, Amares, "Shear wave propagation in a slightly compressible finitely deformed layer over a foundation with pre-stressed fibre-reinforced stratum and dry sandy viscoelastic substrate", Waves in Random and Complex Media, 2019.
 - ❖ Singh, Abhishek Kumar; Koley, Siddhartha; Negi, Anil; Ray, Anusree, "On the dynamic behavior of a functionally graded viscoelastic-piezoelectric composite substrate subjected to a moving line load", European Physical Journal Plus, (134), 2019.
 - ❖ Singh, Abhishek Kumar; Ray, Anusree; Chattopadhyay, Amares, "Analytical study on propagation of G-type waves in a transversely isotropic substrate beneath a stratum considering couple stress", International Journal of Geomechanics, (19:7), 2019.
 - ❖ Singh, Abhishek; Vishwakarma, Gajendra K., "Improved predictive estimation for mean using the Searls technique under ranked set sampling", Communications in Statistics-Theory and Methods, 2019.
 - ❖ Singh, Ajaypreet; Pal, Amrindra; Singh, Yadvendra; Sharma, Sandeep, "Design of optimized all-optical NAND gate using metal-insulator-metal waveguide", Optik, (182), 2019, pp. 524-528.
 - ❖ Singh, Ashok Kumar; Singh, D. B.; Mallick, Ashis; Harender; Sharma, Sanjeev Kumar; Kumar, Navneet; Dwivedi, V. K., "Performance analysis of specially designed single basin passive solar distillers incorporated with novel solar desalting stills: a review", Solar Energy, (185), 2019, pp. 146-164.
 - ❖ Singh, Bindeshwar; Mukherjee, V.; Tiwari, Prabhakar, "GA-based optimization for optimally placed and properly coordinated control of distributed generations and static var compensator in distribution networks", Energy Reports, (5), 2019, pp. 926-959.
 - ❖ Singh, Chitransh; Chandravanshi, Madan Lal, "Performance and noise analysis of vibratory feeder using dynamic rubber spring model", Proceedings of the Institution of Mechanical Engineers Part C- Journal of Mechanical Engineering Science, (234:2), 2020, pp. 530-543.
 - ❖ Singh, Desh Bandhu; Kumar, Navneet; Harender; Kumar, Satish; Sharma, Sanjeev Kumar; Mallick, Ashis, "Effect of depth of water on various efficiencies and productivity of N identical partially covered PVT collectors incorporated single slope solar distiller unit", Desalination and Water Treatment, (138), 2019, pp. 99-112.
 - ❖ Singh, G. N.; Bhattacharyya, D.; Bandyopadhyay, A., "Formulation of logarithmic type estimators to estimate population mean in successive sampling in presence of random non response and measurement errors", Communications in Statistics-Simulation and Computation, 2019.
 - ❖ Singh, G. N.; Singh, C.; Suman, S., "Revisit of a randomized response model for estimating a rare sensitive attribute under probability proportional to size sampling using Poisson probability distribution", Communications in Statistics-theory and Methods, (48:11), 2019, pp. 2766-2786.
 - ❖ Singh, G. N.; Singh, C.; Suman, S., "Estimation of a rare sensitive attribute for two-stage randomized response model in probability proportional to size sampling using Poisson probability distribution", Statistics, (53:2), 2019, pp. 387-394.
 - ❖ Singh, G. N.; Suman, S., "A modified two-stage randomized response model for estimating the proportion of stigmatized

- attribute", *Journal of Applied Statistics*, (46:6), 2019, pp. 958-978.
- ❖ Singh, Garib N.; Pandey, Awadhesh K.; Singh, Chandraketu; Suman, Surbhi, "An improved alternative estimation procedure for current population mean in presence of positively and negatively correlated auxiliary variables in two-occasion rotation patterns", *Communications in Statistics-theory and Methods*, (49:13), 2020, pp. 3094-3125.
 - ❖ Singh, Garib Nath; Khalid, Mohd, "A composite class of estimators to deal with the issue of variance estimation under the situations of random non-response in two-occasion successive sampling", *Communications in Statistics-Simulation and Computation*, 2019.
 - ❖ Singh, Garib Nath; Khalid, Mohd, "Some imputation methods to compensate with non-response for estimation of population mean in two-occasion successive sampling", *Communications in Statistics-Theory and Methods*, (49:14), 2020, pp. 3329-3351.
 - ❖ Singh, Garib Nath; Pandey, Awadhesh K.; Singh, Chandraketu, "Generalized estimation strategy for mean estimation on current occasion in two-occasion rotation patterns", *Communications in Statistics-Simulation and Computation*, 2019.
 - ❖ Singh, Garib Nath; Singh, Chandraketu; Kumar, Amod, "A modified randomized device for estimation of population mean of quantitative sensitive variable with measure of privacy protection", *Communications in Statistics-Simulation and Computation*, 2019.
 - ❖ Singh, Garib Nath; Suman, Surbhi, "An ameliorated two-stage randomized response model for estimating a rare stigmatized characteristic using Poisson distribution", *Kuwait Journal of Science*, (46:2), 2019, pp. 21-30.
 - ❖ Singh, Garib Nath; Usman, Mahamood, "Efficient combination of various estimators in the presence of non-response", *Communications in Statistics-Simulation and Computation*, 2019.
 - ❖ Singh, J.; Kumaraswamidhas, L. A.; Kaushik, K.; Bura, N.; Sharma, N. D., "Uncertainty analysis of distortion coefficient of piston gauge using Monte Carlo method", *Mapan-Journal of Metrology Society of India*, (34:3), 2019, pp. 379-385.
 - ❖ Singh, Jasveer; Kumaraswamidhas, L. A.; Sharma, Nita Dilawar, "A comparative investigation of pressure distortion coefficient of a pneumatic piston gauge and its associated uncertainty using varied approaches", *Accreditation and Quality Assurance*, (24:2), 2019, pp. 105-112.
 - ❖ Singh, Jayraj; Banka, Haider; Verma, A. K., "Locating critical failure surface using meta-heuristic approaches: a comparative assessment", *Arabian Journal of Geosciences*, (12:9), 2019.
 - ❖ Singh, Jayraj; Banka, Haider; Verma, Amit Kumar, "A BBO-based algorithm for slope stability analysis by locating critical failure surface", *Neural Computing & Applications*, (31:10), 2019, pp. 6401-6418.
 - ❖ Singh, Jyoti Prakash; Nandi, Tandra; Ghosh, Subrata Kumar; Prasad, N. Eswara, "Preparation and isolation of carbon nanorods and "carbon nanoflowers" through combustion of candle wax for heat transfer application", *Combustion Science and Technology*, (192:6), 2020, pp. 1066-1087.
 - ❖ Singh, K. K. K.; Bharti, Abhay Kumar; Pal, S. K.; Prakash, Amar; Saurabh; Kumar, Rajwardhan; Singh, P. K., "Delineation of fracture zone for groundwater using combined inversion technique", *Environmental Earth Sciences*, (78:4), 2019.
 - ❖ Singh, K. K.; Chaudhary, S. K.; Venugopal, R., "Enhancement of flexural strength of glass fiber reinforced polymer laminates using multiwall carbon nanotubes", *Polymer Engineering and Science*, (59), 2019, pp. E248-E261.
 - ❖ Singh, K. K.; Gaurav, Anand, "Effectiveness of short and straight carbon nanotubes on dispersion state and

- static/dynamic mechanical properties of woven glass fibre-reinforced polymer laminates", *Proceedings of the Institution of Mechanical Engineers Part L-Journal of Materials-Design and Applications*, (233:8), 2019, pp. 1661-1677.
- ❖ Singh, Kuldeep; Mandal, Sanjoy, "Design and performance analysis of all-optical 1:4 and 1:8 high speed demultiplexer using InGaAsP-InP optical microring resonator in Z-domain", *Optical and Quantum Electronics*, (51:8), 2019.
 - ❖ Singh, Mahendra; Kumar, Chiranjeev; Nath, Prem, "Mobility pattern based chord (MP-chord) for enhanced lookup performance in mobile P2P networks", *Wireless Personal Communications*, (109:3), 2019, pp. 1971-1985.
 - ❖ Singh, Mandeep; Raghuwanshi, Sanjeev Kumar; Prakash, Om, "Ultra-sensitive fiber optic gas sensor using graphene oxide coated long period gratings", *IEEE Photonics Technology Letters*, (31:17), 2019, pp. 1473-1476.
 - ❖ Singh, Mandeep; Raghuwanshi, Sanjeev Kumar; Prakash, Om, "Modeling of grating assisted hybrid plasmonic filter and its on-chip gas sensing application", *IEEE Sensors Journal*, (19:11), 2019, pp. 4039-4044.
 - ❖ Singh, Mandeep; Raghuwanshi, Sanjeev Kumar; Srinivas, T., "Nanophotonic on-chip hybrid plasmonic electro-optic modulator with phase change materials", *Physics Letters A*, (383:25), 2019, pp. 3196-3199.
 - ❖ Singh, Monika; Kumar, Navneet; Dwari, Santanu; Kala, Pradyot, "Metamaterial-inspired miniaturized antenna loaded with IDC and meander line inductor using partial ground plane", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:9), 2019.
 - ❖ Singh, Nishant K.; Pandey, Pulak M.; Singh, K. K., "A semi-empirical model to predict material removal rate during air-assisted electrical discharge machining", *Journal of the Brazilian Society of Mechanical Sciences and Engineering*, (41:3), 2019.
 - ❖ Singh, Piyush Pratap; Azam, Mohammad Sikandar; Ranjan, Vinayak, "Vibration analysis of a thin functionally graded plate having an out of plane material inhomogeneity resting on Winkler-Pasternak foundation under different combinations of boundary conditions", *Proceedings of the Institution of Mechanical Engineers Part C-Journal of Mechanical Engineering Science*, (233:8), 2019, pp. 2636-2662.
 - ❖ Singh, Pooja; Chattopadhyay, Amares; Singh, Abhishek Kumar, "Propagation of Love-type wave in functionally graded prestressed magneto-visco-elastic fiber-reinforced composite structure", *Waves in Random and Complex Media*, 2019.
 - ❖ Singh, Prem; Mishra, Himanshu B.; Jagannatham, Aditya K.; Vasudevan, K., "Semi-blind, training, and data-aided channel estimation schemes for MIMO-FBMC-OQAM systems", *IEEE Transactions on Signal Processing*, (67:18), 2019, pp. 4668-4682.
 - ❖ Singh, Purushottam Kumar; Kumar, Pankaj; Das, Alok Kumar, "Unconventional physical methods for synthesis of metal and non-metal nanoparticles: a review", *Proceedings of the National Academy of Sciences India Section A-Physical Sciences*, (89:2), 2019, pp. 199-221.
 - ❖ Singh, Rajinder; Choudhary, Ram Bilash; Kandulna, Rohit, "Optical band gap tuning and thermal properties of PMMA-ZnO sensitized polymers for efficient exciton generation in solar cell application", *Materials Science in Semiconductor Processing*, (103), 2019.
 - ❖ Singh, Rajinder; Choudhary, Ram Bilash; Kandulna, Rohit, "Robust optical and electrical properties of TiO₂-sensitized polymeric (PANI-TiO₂) nanocomposites for hybrid solar cell application", *Bulletin of Materials Science*, (42:5), 2019.
 - ❖ Singh, Ramesh Kumar; Mandal, Deepak Kumar, "Air-assisted impact of water drops

- on a surface", *Acta Mechanica*, (230:9), 2019, pp. 3171-3182.
- ❖ Singh, Rashmi; Sharma, Subham; Mitra, Supriyo; Khan, Prosanta Kumar, "Mapping of coda-wave attenuation and its frequency dependency over eastern Indian shield", *Pure and Applied Geophysics*, (176:12), 2019, pp. 5291-5313.
 - ❖ Singh, Ravindra Kumar; Villuri, Vasanta Govind Kumar; Pasupuleti, Srinivas, "Assessment of parameters and preparation of hydrodynamic model for lower Damodar basin using geomatic techniques", *Mausam*, (70:4), 2019, pp. 815-824.
 - ❖ Singh, Ritu Raj; Kumari, Soumya; Gautam, Abhinav; Priye, Vishnu, "Glucose sensing using slot waveguide-based SOI ring resonator", *IEEE Journal of Selected Topics in Quantum Electronics*, (25:1), 2019.
 - ❖ Singh, Roshan K.; Maurya, Ved P.; Shalivahan; Singh, Sahendra, "Imaging regional geology and Au-sulphide mineralization over Dhanjori greenstone belt: implications from 3-D inversion of audio magnetotelluric data and petrophysical characterization", *Ore Geology Reviews*, (106), 2019, pp. 369-386.
 - ❖ Singh, Roshan Kumar; Gupta, Ashok K.; Maurya, Ved P.; Singh, S.; Shalivahan, "3D inversion of audio magnetotelluric data for sulphide mineralization over Dhanjori basin", *Journal of the Geological Society of India*, (93:2), 2019, pp. 213-217.
 - ❖ Singh, Rukmani; Priye, Vishnu, "Ultrahigh-sensitivity label-free optical biosensor based on a silicon nanowire rectangular optical waveguide for lung cancer detection", *Journal of the Optical Society of America B-Optical Physics*, (36:9), 2019, pp. 2402-2406.
 - ❖ Singh, Rukmani; Singh, Ritu Raj; Priye, Vishnu, "Parametric optimization of fiber to waveguide coupler using Bragg gratings", *Optical and Quantum Electronics*, (51:8), 2019.
 - ❖ Singh, Sanjeev Kumar; Kumar, Chiranjeev; Nath, Prem, "Local contribution (LC) and trustworthiness factors to induce fairness in P2P networks", *Wireless Personal Communications*, (107:1), 2019, pp. 303-323.
 - ❖ Singh, Santosh Kumar; Samanta, Suprakash; Das, Alok Kumar; Sahoo, Rashmi R., "Electrodeposited SiC-graphene oxide composite in nickel matrix for improved tribological applications", *Surface Topography-Metrology and Properties*, (7:3), 2019.
 - ❖ Singh, Santosh; Samanta, Suprakash; Das, Alok Kumar; Sahoo, Rashmi R., "Hydrophobic reduced graphene oxide-based Ni coating for improved tribological application", *Journal of Materials Engineering and Performance*, (28:6), 2019, pp. 3704-3713.
 - ❖ Singh, Shailesh Kumar; Chattopadhyaya, Somnath; Pramanik, A.; Kumar, Sanjeev; Basak, A. K., "Wear of chromium nitride coating under high loads and speeds", *International Journal of Surface Science and Engineering*, (13:4), 2019, pp. 263-282.
 - ❖ Singh, Shailesh Kumar; Chattopadhyaya, Somnath; Pramanik, A.; Kumar, Sanjeev; Basak, A. K., "Effect of lubrication on the wear behaviour of CrN coating deposited by PVD process", *International Journal of Surface Science and Engineering*, (13:1), 2019, pp. 60-78.
 - ❖ Singh, Veerendra; Dixit, Prashant; Venugopal, R.; Venkatesh, K. Bhanu, "Ore pretreatment methods for grinding: journey and prospects", *Mineral Processing and Extractive Metallurgy Review*, (40:1), 2019, pp. 1-15.
 - ❖ Singh, Yadvendra; Raghuvanshi, Sanjeev Kumar, "Design and development of a novel level transmitter utilizing lithium niobate (LiNbO₃) Mach-Zehnder modulator for hazardous regions", *Optik*, (181), 2019, pp. 748-759.
 - ❖ Singha, Dip Kumar; Shukla, Pradeep Kumar; Chatterjee, Rima; Sain, Kalachand, "Multi-channel 2D seismic constraints on pore pressure- and vertical stress-related

- gas hydrate in the deep offshore of the Mahanadi basin, India", *Journal of Asian Earth Sciences*, (180), 2019.
- ❖ Singha, Soumya S.; Pasupuleti, Srinivas; Singha, Sudhakar; Sing, Rambabu; Venkatesh, A. S., "Analytic network process based approach for delineation of groundwater potential zones in Korba district, central India using remote sensing and GIS", *Geocarto International*, 2019.
 - ❖ Singha, Soumya S.; Pasupuleti, Srinivas; Singha, Sudhakar; Singh, Rambabu; Venkatesh, A. S., "A GIS-based modified DRASTIC approach for geospatial modeling of groundwater vulnerability and pollution risk mapping in Korba district, central India", *Environmental Earth Sciences*, (78:21), 2019.
 - ❖ Singha, Sudhakar; Pasupuleti, Srinivas; Durbha, Krishna Sandilya; Singha, Soumya S.; Singh, Rambabu; Venkatesh, A. S., "An analytical hierarchy process-based geospatial modeling for delineation of potential anthropogenic contamination zones of groundwater from Arang block of Raipur district, Chhattisgarh, central India", *Environmental Earth Sciences*, (78:24), 2019.
 - ❖ Singhal, Abhinav; Sahu, Sanjeev A.; Chaudhary, Soniya, "Study of surface wave vibration in rotating human long bones of cylindrical shape under the magnetic field influence", *Waves in Random and Complex Media*, 2019.
 - ❖ Singhal, Abhinav; Sahu, Sanjeev A.; Chaudhary, Soniya; Baroi, Juhi, "Initial and couple stress influence on the surface waves transmission in material layers with imperfect interface", *Materials Research Express*, (6:10), 2019.
 - ❖ Singhal, Abhinav; Sahu, Sanjeev A.; Nirwal, Sonal; Chaudhary, Soniya, "Anatomy of flexoelectricity in micro plates with dielectrically highly/weakly and mechanically complaint interface", *Materials Research Express*, (6:10), 2019.
 - ❖ Sinha, Akanksha; Das, Madan Kumar; Jana, Kartick Chandra, "Control of asymmetrical cascaded multilevel inverter for a grid-connected photovoltaic system", *IET Renewable Power Generation*, (13:9), 2019, pp. 1456-1465.
 - ❖ Sinha, Akanksha; Jana, Kartick Chandra; Das, Madan Kumar, "Control strategy of PV-fed, grid-interfaced, seven-level T-type MLI for distributed power generation", *IET Power Electronics*, (12:12), 2019, pp. 3208-3219.
 - ❖ Sinha, Ankita; Chakraborty, Jishnunil; Banerjee, Suparna; Gangopadhyay, Jaydip, "Dimethylphenylphosphine oxide coordinated trivalent rhenium featuring pyridylbenzazole chelation: oxygen atom transfer kinetics, isomer preference, metal oxidation and computational analysis", *Polyhedron*, (171), 2019, pp. 112-119.
 - ❖ Sinha, Debanjan; Syed, Tajdarul H.; Reager, John T., "Utilizing combined deviations of precipitation and GRACE-based terrestrial water storage as a metric for drought characterization: a case study over major Indian river basins", *Journal of Hydrology*, (572), 2019, pp. 294-307.
 - ❖ Sinha, Nidhi; Antony, Bobby, "Inelastic cross sections for pentane isomers by positron impact", *Molecular Physics*, (117:18), 2019, pp. 2527-2534.
 - ❖ Sinha, Nidhi; Gupta, Dhanoj; Antony, Bobby, "Electron impact ionisation cross-sections for complex molecules", *Journal of Physics B-Atomic Molecular and Optical Physics*, (52:14), 2019.
 - ❖ Sinha, Nidhi; Patel, Durgesini; Antony, Bobby, "Positron scattering: total elastic and grand total cross sections for molecules of astrophysical importance", *Chemistryselect*, (4:15), 2019, pp. 4575-4581.
 - ❖ Sinha, R. S.; Mukhopadhyay, A. K., "Failure rate analysis of jaw crusher: a case study", *Sadhana-Academy Proceedings in Engineering Sciences*, (44:1), 2019.
 - ❖ Sinha, Rabindra Kumar; Jawed, Mohammad; Sengupta, Smarjit, "An approach for support design in depillaring panels of coal mines", *Arabian Journal of Geosciences*, (12:21), 2019.

- ❖ Sinha, Shambhu Sharan Kumar; Kumar, Subindu; Das, Mukul Kumar, "Dot size variability induced changes in the optical absorption spectra of interdiffused quantum dot systems", *Applied Physics A-Materials Science & Processing*, (125:11), 2019.
- ❖ Sinha, Shriya; Mahata, Manoj Kumar; Kumar, Kaushal , "Enhancing the upconversion luminescence properties of Er³⁺-Yb³⁺ doped yttrium molybdate through Mg²⁺ incorporation: effect of laser excitation power on temperature sensing and heat generation", *New Journal of Chemistry*, (43:15), 2019, pp. 5960-5971.
- ❖ Snehi, Shivam; Singh, Hariraj; Priya, Tanwi; Mishra, Brijesh Kumar, "Understanding the natural organic matter removal mechanism from mine and surface water through the electrocoagulation method", *Journal of Water Supply Research and Technology-Aqua*, (68:7), 2019, pp. 523-534.
- ❖ Sonak, Ruchita; Ameen, Mohammad; Chaudhary, Raghvendra Kumar, "Triple band omnidirectional miniaturized metamaterial inspired antenna using flipped rectangular stub for LTE, WiMAX, and WLAN applications", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:7), 2019.
- ❖ Sonak, Ruchita; Ameen, Mohammad; Chaudhary, Raghvendra Kumar, "High gain dual-band open-ended metamaterial antenna utilizing CRR with broadside radiation characteristics based on left-handed AMC and PEC", *Materials Research Express*, (6:5), 2019.
- ❖ Sonak, Ruchita; Ameen, Mohammad; Chaudhary, Raghvendra Kumar, "CPW-fed electrically small open-ended zeroth order resonating metamaterial antenna with dual-band features for GPS/ WiMAX/WLAN applications", *AEU-International Journal of Electronics and Communications*, (104), 2019, pp. 99-107.
- ❖ Soni, Preeti; Pal, Arup Kumar; Islam, S. K. Hafizul, "An improved three-factor authentication scheme for patient monitoring using WSN in remote health-care system", *Computer Methods and Programs in Biomedicine*, (182), 2019.
- ❖ Soni; Mishra, S. K.; Sharma, S. K., "Influence of nitrogen partial pressure on optical properties of magnetron sputtered Al-Si-N thin films", *Thin Solid Films*, (682), 2019, pp.1-9.
- ❖ Sourav, Kumar; Sen, Subhankar, "Transition of VIV-only motion of a square cylinder to combined VIV and galloping at low Reynolds numbers", *Ocean Engineering*, (187), 2019.
- ❖ Srirarn, Sangeetha; Kumar, Aditya, "Separation of oil-water via porous PMMA/SiO₂ nanoparticles superhydrophobic surface", *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, (563), 2019, pp. 271-279.
- ❖ Srivastava, Akanksha; Chattopadhyay, Amares; Singh, Abhishek Kumar, "Impact of inhomogeneous fiber-reinforced layer with frictional interface on Rayleigh-type wave propagation", *Journal of Engineering Mathematics*, (114:1), 2019, pp. 159-176.
- ❖ Srivastava, Ashish Kumar; Nag, Akash; Dixit, Amit Rai; Hloch, Sergej; Tiwari, Sandeep; Scucka, Jiri; Pachauri, Praveen, "Surface integrity in wire-EDM tangential turning of in situ hybrid metal matrix composite A359/B4C/Al₂O₃", *Science and Engineering of Composite Materials*, (26:1), 2019, pp. 122-133.
- ❖ Srivastava, Ashish Kumar; Nag, Akash; Dixit, Amit Rai; Scucka, Jiri; Hloch, Sergej; Klichova, Dagmar; Hlavacek, Petr; Tiwari, Sandeep, "Hardness measurement of surfaces on hybrid metal matrix composite created by turning using an abrasive water jet and WED", *Measurement*, (131), 2019, pp. 628-639.
- ❖ Srivastava, Jay Prakash; Sarkar, Prabir Kumar; Kiran, M. V. Ravi; Ranjan, Vinayak, "A numerical study on effects of friction-induced thermal load for rail under varied wheel slip conditions", *Simulation-Transactions of the Society for Modeling and Simulation International*, (95:4), 2019, pp. 351-362.

Research, Development, Innovation & Entrepreneurship

- ❖ Srivastava, Kunal; Kanaujia, Binod Kumar; Dwari, Santanu; Kumar, Sachin; Khan, Taimoor, "3D cuboidal design MIMO/diversity antenna with band notched characteristics", *AEU-International Journal of Electronics and Communications*, (108), 2019, pp. 141-147.
- ❖ Srivastava, Kunal; Kumar, Ashwani; Chaudhary, Prashant; Kanaujia, Binod K.; Dwari, Santanu; Verma, Anand K.; Esselle, Karu P.; Mittra, Raj, "Wideband and high-gain circularly polarised microstrip antenna design using sandwiched metasurfaces and partially reflecting surface", *IET Microwaves Antennas & Propagation*, (13:3), 2019, pp. 305-312.
- ❖ Srivastava, Kunal; Kumar, Ashwani; Kanaujia, B. K.; Dwari, Santanu; Kumar, Sachin, "Low profile single feed monopole antenna for quad-band circularly polarised applications", *International Journal of Electronics*, (106:2), 2019, pp. 318-331.
- ❖ Srivastava, Kunal; Kumar, Ashwani; Kanaujia, Binod K.; Dwari, Santanu; Kumar, Sachin, "Low profile coupling feed circularly polarized antennas for WLAN applications", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:2), 2019.
- ❖ Srivastava, Kunal; Kumar, Ashwani; Kanaujia, Binod K.; Dwari, Santanu; Kumar, Sachin, "A CPW-fed UWB MIMO antenna with integrated GSM band and dual band notches", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:1), 2019.
- ❖ Srivastava, Madhulika; Hloch, Sergej; Gubeljak, Nenad; Milkovic, Marijana; Chattopadhyaya, Somnath; Klich, Jiri, "Surface integrity and residual stress analysis of pulsed water jet peened stainless steel surfaces", *Measurement*, (143), 2019, pp. 81-92.
- ❖ Srivastava, Pushkar; Sharma, Ravindra K.; Ranjan, Rajeev K., "On the realisation of current-mode four-quadrant CMOS cuber", *Analog Integrated Circuits and Signal Processing*, (99:1), 2019, pp. 47-61.
- ❖ Srivastava, Varnita; Das, Niladri; Pattanayak, Jamini Kanta, "Impact of corporate governance attributes on cost of equity Evidence from an emerging economy", *Managerial Auditing Journal*, (34:2), 2019, pp. 142-161.
- ❖ Subudhi, Priyambada; Mukhopadhyay, Susanta, "An efficient graph reduction framework for interactive texture segmentation", *Signal Processing-Image Communication*, (74), 2019, pp. 42-53.
- ❖ Sukul, Prasenjit Prasad; Mahata, Manoj Kumar; Ghorai, Uttam Kumar; Kumar, Kaushal, "Crystal phase induced upconversion enhancement in Er³⁺/Yb³⁺ doped SrTiO₃ ceramic and its temperature sensing studies", *Spectrochimica Acta Part A-Molecular and Biomolecular Spectroscopy*, (212), 2019, pp. 78-87.
- ❖ Suman, Sanjeet Kumar; Kumar, Shravan, "Reverse flotation studies on iron ore slime by the synergistic effect of cationic collectors", *Separation Science and Technology*, (55:9), 2020, pp. 1702-1714.
- ❖ Suman, Surbhi; Singh, G. N., "An ameliorated stratified two-stage randomized response model for estimating the rare sensitive parameter under Poisson distribution", *Statistics*, (53:2), 2019, pp. 395-416.
- ❖ Sunasee, Sharmini; Leong, Kah Hon; Wong, Kien Tiek; Lee, Gooyong; Pichiah, Saravanan; Nah, InWook; Jeon, Byong-Hun; Yoon, Yeomin; Jang, Min, "Sonophotocatalytic degradation of bisphenol A and its intermediates with graphitic carbon nitride", *Environmental Science and Pollution Research*, (26:2), 2019, pp. 1082-1093.
- ❖ Sur, Debolina; Sharma, Anand; Gangwar, Ravi Kumar; Sahu, Nikesh Kumar, "A novel wideband Minkowski fractal antenna with assistance of triangular dielectric resonator elements", *International Journal of RF and Microwave Computer-Aided Engineering*, (29:2), 2019.
- ❖ Swain, Sagar Kumar; Roy, P. N. S.; Mukherjee, Bappa; Sawkar, R. H., "Fractal dimension and its translation into a model

- of gold spatial proxy", *Ore Geology Reviews*, (110), 2019.
- ❖ Swiatek, Bartlomiej; Wos, Bartlomiej; Chodak, Marcin; Maiti, Subodh Kumar; Jozefowska, Agnieszka; Pietrzykowski, Marcin, "Fine root biomass and the associated C and nutrient pool under the alder (*alnus spp.*) plantings on reclaimed technosols", *Geoderma*, (337), 2019, pp. 1021-1027.
 - ❖ Tarafdar, Abhrajyoti; Sinha, Alok, "Health risk assessment and source study of PAHs from roadside soil dust of a heavy mining area in India", *Archives of Environmental & Occupational Health*, (74:5), 2019, pp. 252-262.
 - ❖ Tarafdar, Abhrajyoti; Sinha, Alok, "Discussion on the technical note entitled, "public health risk assessment following exposure to PAH-contaminated soils - specific considerations for bioaccessibility and other exposure parameters"", *Science of the Total Environment*, (656), 2019, pp. 1448-1451.
 - ❖ Taye, Deepak; Mohanty, Shalini; Das, Alok Kumar; Singh, Nirmal Kumar, "Electroless Ni-Al₂O₃-WS₂ composite coating on aluminum substrate", *Transactions of the Indian Institute of Metals*, (72:9), 2019, pp. 2281-2292.
 - ❖ Thakur, Rabindra Nath; Gupta, Sunil Kumar; Sinha, Alok; Chawla, Sowmiya; Vadavadagi, Shilpa S., "A durability study of jute geotextile treated with bitumen emulsion", *Journal of Natural Fibers*, 2019.
 - ❖ Thangapazham, P.; Kumaraswamidhas, L. A.; Muruganandam, D., "Evolution of 52CrMoV4 from 51CrV4 material to withstand field severity of parabolic leaf spring suspension in heavy-duty commercial vehicles", *Transactions of the Canadian Society for Mechanical Engineering*, (43:3), 2019, pp. 387-397.
 - ❖ Thangapazham, P.; Kumaraswamidhas, L. A.; Muruganandam, D., "Failure mode investigation and re-design of heavy-duty commercial vehicle bogie bracket", *Transactions of the Canadian Society for*
 - Mechanical Engineering, (43:3), 2019, pp. 405-415
 - ❖ Thangaraj, Jaisingh; Ravi, Banoth; Kumari, Sunaina, "Performance analysis of collision avoidance routing protocol for inter-vehicular communication", *Cluster Computing-the Journal of Networks Software Tools and Applications*, (22), 2019, pp. S7769-S7775.
 - ❖ Thummaluru, Sreenath Reddy; Ameen, Mohammad; Chaudhary, Raghvendra Kumar, "Four-port MIMO cognitive radio system for midband 5G applications", *IEEE Transactions on Antennas and Propagation*, (67:8), 2019, pp. 5634-5645.
 - ❖ Thummaluru, Sreenath Reddy; Chejarla, Suresh; Chaudhary, Raghvendra Kumar, "Structural investigation of metamaterial unit-cells: development of incident angle insensitive metamaterial absorbers", *Materials Research Express*, (6:5), 2019.
 - ❖ Thummaluru, Sreenath Reddy; Kumar, Rajkishor; Chaudhary, Raghvendra Kumar, "Isolation and frequency reconfigurable compact MIMO antenna for wireless local area network applications", *IET Microwaves Antennas & Propagation*, (13:4), 2019, pp. 519-525.
 - ❖ Tiwari, Manoj Kumar; Pandey, Neeta; Paul, Sajal K.; Rizvi, Saiyid Mohammad Irshad, "Programmable CCCII: reliability analysis and design methodology", *IET Circuits Devices & Systems*, (13:4), 2019, pp. 487-493.
 - ❖ Tiwari, Rakesh N.; Singh, Prabhakar; Kanaujia, Binod Kumar; Srivastava, Kunal, "Neutralization technique based two and four port high isolation MIMO antennas for UWB communication", *AEU-International Journal of Electronics and Communications*, (110), 2019.
 - ❖ Tiwary, Badyanath; Kumar, Ritesh; Lee, Poh Seng; Singh, Pawan Kumar, "Numerical investigation of thermal and hydraulic performance in novel oblique geometry using nanofluid", *Numerical Heat Transfer Part A-Applications*, (76:7), 2019, pp. 533-551.

Research, Development, Innovation & Entrepreneurship

- ❖ Tomar, Abhinav; Muduli, Lalatendu; Jana, Prasanta K., "An efficient scheduling scheme for on-demand mobile charging in wireless rechargeable sensor networks", *Pervasive and Mobile Computing*, (59), 2019.
- ❖ Tripathi, Anurag; Shalivahan, S. S.; Bage, Ashish K.; Singh, Shailendra; Yadav, Pramod Kumar, "Audio-magnetotelluric investigation of Bakreswar geothermal province, eastern India", *Journal of Earth System Science*, (128:4), 2019.
- ❖ Tripathi, Gaurav; Anowarul, Habib; Agarwal, Krishna; Prasad, Dilip K., "Classification of micro-damage in piezoelectric ceramics using machine learning of ultrasound signals", *Sensors*, (19:19), 2019.
- ❖ Tripathi, Prashant Mani; Sahoo, Subhendu Sekhar; Chatterjee, Kalyan, "Enhancement of low-voltage ride through of wind energy conversion system using superconducting saturated core fault current limiter", *International Transactions on Electrical Energy Systems*, (29:4), 2019.
- ❖ Tripathi, Rupam; Hloch, Sergej; Chattopadhyaya, Somnath; Klichova, Dagmar; Klich, Jiri, "Influence of frequency change during sandstone erosion by pulsed waterjet", *Materials and Manufacturing Processes*, (35:2), 2020, pp. 187-194.
- ❖ Tudu, Balraj K.; Kumar, Aditya; Bhushan, Bharat, "Fabrication of superoleophobic cotton fabric for multi-purpose applications", *Philosophical Transactions of the Royal Society A-Mathematical Physical and Engineering Sciences*, (377:2150), 2019.
- ❖ Tudu, Balraj Krishnan; Kumar, Aditya, "Robust and durable superhydrophobic steel and copper meshes for separation of oil-water emulsions", *Progress in Organic Coatings*, (133), 2019, pp. 316-324.
- ❖ Tudu, Balraj Krishnan; Kumar, Aditya; Bhushan, Bharat, "Facile approach to develop anti-corrosive superhydrophobic aluminium with high mechanical, chemical and thermal durability", *Philosophical Transactions of the Royal Society A-Mathematical Physical and Engineering Sciences*, (377:2138), 2019.
- ❖ Tyagi, Rashi; Mahto, Nitish Kumar; Das, Alok Kumar; Mandal, Amitava, "Preparation of MoS₂+Cu coating through the EDC process and its analysis", *Surface Engineering*, (36:1), 2020, pp. 86-93.
- ❖ Tyagi, Rashi; Pandey, Kshitij; Das, Alok Kumar; Mandal, Amitava, "Deposition of hBN plus Cu layer through electrical discharge process using green compact electrode", *Materials and Manufacturing Processes*, (34:9), 2019, pp. 1035-1048.
- ❖ Ul Hogue, Injamam; Chowdhury, Soumyadeep Roy; Maity, Soumitra, "Photoredox-catalyzed intermolecular radical arylthiocyanation/ arylselenocyanation of alkenes: access to aryl-substituted alkylthiocyanates/ alkylselenocyanates", *Journal of Organic Chemistry*, (84:6), 2019, pp. 3025-3035.
- ❖ Upadhyay, Ranjit Kumar; Kumari, Sangeeta, "Discrete and data packet delays as determinants of switching stability in wireless sensor networks", *Applied Mathematical Modelling*, (72), 2019, pp. 513-536.
- ❖ Upadhyay, Ranjit Kumar; Kumari, Sarita; Kumar, Pramod; Rai, Vikas, "Spatial distribution of microalgae in marine systems: a reaction-diffusion model", *Ecological Complexity*, (39), 2019.
- ❖ Upadhyay, Ranjit Kumar; Mishra, Swati, "Population dynamic consequences of fearful prey in a spatiotemporal predator-prey system", *Mathematical Biosciences and Engineering*, (16:1), 2019, pp. 338-372.
- ❖ Upadhyay, Ranjit Kumar; Mishra, Swati; Dong, Yueping; Takeuchi, Yasuhiro, "Exploring the dynamics of a tritrophic food chain model with multiple gestation periods", *Mathematical Biosciences and Engineering*, (16:5), 2019, pp. 4660-4691.
- ❖ Upadhyay, Ranjit Kumar; Pal, Ashok Kumar; Kumari, Sangeeta; Roy, Parimita, "Dynamics of an SEIR epidemic model

- with nonlinear incidence and treatment rates", *Nonlinear Dynamics*, (96:4), 2019, pp. 2351-2368.
- ❖ Upadhyay, Ranjit Kumar; Parshad, Rana D.; Antwi-Fordjour, Kwadwo; Quansah, Emmanuel; Kumari, Sarita, "Global dynamics of stochastic predator-prey model with mutual interference and prey defense", *Journal of Applied Mathematics and Computing*, (60), 2019, pp. 169-190.
 - ❖ Upadhyay, Shivangi; Saha, Amal Krishna; Sinha, Alok, "High carbon iron filings (HCIF) and metal reducing bacteria (*Serratia* sp.) co-assisted Cr (VI) reduction: kinetics, mechanism and longevity", *Journal of Environmental Management*, (236), 2019, pp. 388-395.
 - ❖ Upasani, Nilam; Om, Hari, "A modified neuro-fuzzy classifier and its parallel implementation on modern GPUs for real time intrusion detection", *Applied Soft Computing*, (82), 2019.
 - ❖ Usmani, Z.; Kumar, V.; Rani, R.; Gupta, P.; Chandra, A., "Changes in physico-chemical, microbiological and biochemical parameters during composting and vermicomposting of coal fly ash: a comparative study", *International Journal of Environmental Science and Technology*, (16:8), 2019, pp. 4647-4664.
 - ❖ Usmani, Zeba; Kumar, Vipin; Gupta, Pratishtha; Gupta, Gauri; Rani, Rupa; Chandra, Avantika, "Enhanced soil fertility, plant growth promotion and microbial enzymatic activities of vermicomposted fly ash", *Scientific Reports*, (9), 2019.
 - ❖ Vafaeifard, Mohsen; Ibrahim, Shaliza; Wong, Kien Tiek; Pasbakhsh, Pooria; Pichiah, Saravanan; Choi, Jaeyoung; Yoon, Yeomin; Jang, Min, "Novel self-assembled 3D flower-like magnesium hydroxide coated granular polyurethane: implication of its potential application for the removal of heavy metals", *Journal of Cleaner Production*, (216), 2019, pp. 495-503.
 - ❖ Vallisree, S.; Thangavel, R.; Lenka, T. R., "Modelling, simulation, optimization of Si/ZnO and Si/ZnMgO heterojunction solar cells", *Materials Research Express*,(6:2),2019.
 - ❖ Vardhan, Alok, "Energy saving analysis of the hydrostatic drives used in the rotary head system of the blast hole drill rig", *Proceedings of the Institution of Mechanical Engineers Part E-Journal of Process Mechanical Engineering*, (233:5), 2019, pp. 1086-1097.
 - ❖ Vardhan, Alok; Dasgupta, K.; Kumar, N.; Mishra, Santosh Kr, "Steady-state performance investigation of open-circuit hydrostatic drives used in the rotary head of drill machine", *Proceedings of the Institution of Mechanical Engineers Part E-Journal of Process Mechanical Engineering*, (233:1), 2019, pp. 3-20.
 - ❖ Vardhan, Alok; Dasgupta, K.; Mishra, Santosh Kumar, "Dynamic analysis of a closed-circuit hydraulic drive system used in the rotary head of blasthole drilling machine using MATLAB-Simulink environment", *Proceedings of the Institution of Mechanical Engineers Part I-Journal of Systems and Control Engineering*, (233:6), 2019, pp. 702-719.
 - ❖ Varma, Ashwini Kumar; Mitra, Debjani, "A novel cloud based self-adaptive cognitive radio network architecture", *AEU-International Journal of Electronics and Communications*, (106), 2019, pp. 32-39.
 - ❖ Varma, Atul Kumar; Biswas, Sanki; Patil, Dattatray J.; Mani, Devleena; Misra, Satabdi; Hazra, Bodhisatwa, "Significance of lithotypes for hydrocarbon generation and storage", *Fuel*, (235), 2019, pp. 396-405.
 - ❖ Varma, Atul Kumar; Mishra, Sumit; Tiwari, Balram; Hazra, Bodhisatwa; Kumar, Susheel; Panigrahi, Durga Charan; Ojha, Anwita, "Petrographic controls on phosphorous distribution in coal seams of the Jharia basin, India", *Journal of Earth System Science*, (128:4), 2019.
 - ❖ Varma, Atul Kumar; Sahoo, Akhandal; Saikia, Binoy K.; Das, Tonkeswar , "Petrographic controls of coal from Ib valley basin for carbon nano-products

- formation", *International Journal of Coal Geology*, (211), 2019.
- ❖ Verma, A. K.; Sardana, Sahil; Sharma, Pushpendra; Dinpuia, Lal; Singh, T. N., "Investigation of rockfall-prone road cut slope near Lengpui airport, Mizoram, India", *Journal of Rock Mechanics and Geotechnical Engineering*, (11:1), 2019, pp. 146-158.
 - ❖ Verma, Ajeet; Choudhary, Ram Bilash, "Mixed morphology, inflated e(-)-h(+) recombination rate and augmented optical absorbance capacity of PANI/PPY/CdS nanocomposite as electron transport layer for OLED application", *Journal of Inorganic and Organometallic Polymers and Materials*, (29:2), 2019, pp. 444-455.
 - ❖ Verma, Akta; Sharma, S. K., "Rare-earth doped/codoped CaMoO₄ phosphors: a candidate for solar spectrum conversion", *Solid State Sciences*, (96), 2019.
 - ❖ Verma, Akta; Sharma, S. K., "Dual-mode luminescence: a new perspective in calcium molybdate phosphor for solar cell application", *Journal of Materials Science-Materials in Electronics*, (30:12), 2019, pp. 11778-11789.
 - ❖ Verma, Amit K.; Chattopadhyay, Amares; Chaki, Mriganka S.; Singh, Abhishek K., "Dispersion of Rayleigh-type wave in an exponentially graded incompressible crustal layer resting on yielding foundation", *Journal of Theoretical and Computational Acoustics*, (27:3), 2019.
 - ❖ Verma, Amit Kumar; Chattopadhyay, Amares; Chaki, Mriganka Shekhar; Singh, Abhishek Kumar, "Rayleigh-type wave propagation on a transversely isotropic viscoelastic layer with yielding and rigid foundations", *Mechanics of Advanced Materials and Structures*, (26:2), 2019, pp. 107-118.
 - ❖ Verma, Amit; Chauhan, Geetanjali; Ojha, Keka; Padmanabhan, Eswaran, "Characterization of nano-Fe₂O₃-stabilized polymer-free foam fracturing fluids for unconventional gas reservoirs", *Energy & Fuels*, (33:11), 2019, pp. 10570-10582.
 - ❖ Verma, Pradeepika; Om, Hari, "A novel approach for text summarization using optimal combination of sentence scoring methods", *Sadhana-Academy Proceedings in Engineering Sciences*, (44:5), 2019.
 - ❖ Verma, Pradeepika; Om, Hari, "MCRM: maximum coverage and relevancy with minimal redundancy based multi-document summarization", *Expert Systems with Applications*, (120), 2019, pp. 43-56.
 - ❖ Verma, Pradeepika; Pal, Sukomal; Om, Hari, "A comparative analysis on hindi and english extractive text summarization", *ACM Transactions on Asian and Low-Resource Language Information Processing*, (18:3), 2019.
 - ❖ Verma, Rahul; Azam, Mohammad Sikandar; Kumar, Shiv Ranjan; Patnaik, Amar, "Mechanical and thermo-mechanical characterization of glass ionomer-filled dental composite", *Polymer Composites*, (40:8), 2019, pp. 3361-3367.
 - ❖ Verma, Renu; Tiwari, S. P.; Upadhyay, Ranjit Kumar, "Transmission dynamics of epidemic spread and outbreak of Ebola in west Africa: fuzzy modeling and simulation", *Journal of Applied Mathematics and Computing*, (60), 2019, pp. 637-671.
 - ❖ Verma, Shruti; Kujur, Shelly; Agrahari, Bhumika; Layek, Samaresh; Pathak, Devendra D., "Synthesis and characterization of cucurbit[6]uril supported copper oxide nanoparticles, CuO@CB[6]: application as nanocatalyst for the synthesis of 2H-indazoles", *Chemistryselect*, (4:35), 2019, pp. 10408-10416.
 - ❖ Verma, Vijay Kumar; Ranjan, Rajeev Kumar; Lekshmi, V.; Azad, Ankit Kumar; Appasani, Bhargav; Nath, Vijay, "A second generation current conveyor based PID controller optimized using a crossover improved genetic algorithm", *Microsystem Technologies-Micro-and Nanosystems-Information Storage and Processing Systems*, (26:5), 2020, pp. 1449-1454.
 - ❖ Verma, Vivek Kumar; Chandra, Bibhas; Kumar, Sumit, "Values and ascribed

- responsibility to predict consumers' attitude and concern towards green hotel visit intention", *Journal of Business Research*, (96), 2019, pp. 206-216.
- ❖ Vettumperumal, R.; Jemima, J. Ruby; Kalyanaraman, S.; Thangavel, R., "Analysis of electronic and optical properties of copper iodide (γ -CuI) by TB - mBJ method - a promising optoelectronic material", *Vacuum*, (162), 2019, pp. 156-162.
 - ❖ Vinayak, Richa; Nayek, Hari Pada, "Selective sensing of a Cu(II) ion by organotin anchored keto-enamine ligands", *New Journal of Chemistry*, (43:40), 2019, pp. 16050-16057.
 - ❖ Vinayak, Richa; Nayek, Hari Pada, "Organotin metalloligands for selective sensing of metal ions", *New Journal of Chemistry*, (43:19), 2019, pp. 7259-7268.
 - ❖ Vishwakarma, Gajendra K.; Singh, Housila P., "Estimation in Post-stratification", *Proceedings of the National Academy of Sciences India Section A-Physical Sciences*, (89:2), 2019, pp. 425-430.
 - ❖ Wahid, Abdul; Rao, Annavarpu Chandra Sekhara, "RKDOS: a relative kernel density-based outlier score", *IETE Technical Review*, 2019.
 - ❖ Wong, Kien Tiek; Jang, Seok Byum; Saravanan, Pichiah; Nah, In Wook; Park, Sehkyu; Choi, Jaeyoung; Park, Chulhwan; Kim, Younghun; Yoon, Yeomin; Jang, Min, "Critical insight on the hydrothermal effects toward exfoliation of g-C₃N₄ and simultaneous in-situ deposition of carbon quantum dots", *Applied Surface Science*, (471), 2019, pp. 703-713.
 - ❖ Wong, Kien Tiek; Saravanan, Pichiah; Nah, In Wook; Choi, Jaeyoung; Park, Chulhwan; Kim, Namchan; Yoon, Yeomin; Jang, Min, "Sonocatalytic reduction of nitrate using magnetic layered double hydroxide: Implications for removal mechanism", *Chemosphere*, (218), 2019, pp. 799-809.
 - ❖ Wrata, Gyan; Ranjan, Prabhat; Bhola, Mohit; Mishra, Santosh Kumar; Das, J., "Position control and performance analysis of hydraulic system using two pump-controlling strategies", *Proceedings of the Institution of Mechanical Engineers Part I- Journal of Systems and Control Engineering*, (233:9), 2019, pp. 1093-1105.
 - ❖ Yadav, Abhinav; Fahad, Mohd; Satapathy, S.; Sarun, P. M., "Effect of tantalum on the temperature dependent electrical characteristics of NaNb_{1-x}TaxO₃ (0.0 ≤ x ≤ 0.3) ceramics between 400 and 560 degrees C", *Journal of Alloys and Compounds*, (797), 2019, pp. 902-911.
 - ❖ Yadav, Amit; Amabili, Marco; Panda, Sarat Kumar; Dey, Tanish, "Non-linear vibration response of functionally graded circular cylindrical shells subjected to thermo-mechanical loading", *Composite Structures*, (229), 2019.
 - ❖ Yadav, Ashok; Nayak, Soumya; Kanta, Hema; Sangwan, Pardeep; Pundir, Ajay; Chatterjee, Rima, "A case study of azimuthal fracture characterization in Cambay basin, India", *Journal of Applied Geophysics*, (169), 2019, pp.239-248.
 - ❖ Yadav, Krishna; Tyagi, Megha; Kumari, Soni; Jagadevan, Sheeja, "Influence of process parameters on optimization of biochar fuel characteristics derived from rice husk: a promising alternative solid fuel", *Bioenergy Research*, (12:4), 2019, pp. 1052-1065.
 - ❖ Yekeen, Nurudeen; Padmanabhan, Eswaran; Idris, Ahmad Kamal; Chauhan, Prithvi Singh, "Nanoparticles applications for hydraulic fracturing of unconventional reservoirs: a comprehensive review of recent advances and prospects", *Journal of Petroleum Science and Engineering*, (178), 2019, pp. 41-73.
 - ❖ Zhang, Zizhen; Kumari, Sangeeta; Upadhyay, Ranjit Kumar, "A delayed e-epidemic SLBS model for computer virus", *Advances in Difference Equations*, (2019:1), 2019.

3.2 Sponsored Research Projects

An increase in funding for the various R&D projects was continued in the financial year 2019- 20 also at IIT(ISM) Dhanbad. A total no. of 69 new projects worth Rs. 3301.11 lakhs were sanctioned for various qualitative research projects in diverse disciplines of engineering, science, social science, and management. Some of the sponsoring agencies were Department of Science and Technology; Defence Research Development Organization; Department of Atomic Energy; Ministry of Mines; Ministry of Coal; Bharat Coking Coal Limited; Eastern Coalfields Limited; Steel Authority of India Limited; Tata Steel Limited; Larsen & Toubro etc. The actual amount received for the following R&D projects during the financial year 2019-20 was Rs. 2057.34 lakhs.

Sl. No.	Title of the R&D Project; Name of PI/ Co-PI/Mentor; Department	Funded by
1	Performance evaluation of controller placement for software-defined networks; Prof. Jaisingh Thangaraj (PI); ECE	DST
2	Development of lightweight high entropy alloy (HEA) nanocomposites; Prof. Ashis Mallick (PI); MECH	DST
3	Geoenvironmental and geotechnical issues of coal mine overburden; Prof. Sarat Kr. Das (PI); CE	SPARC
4	Upgradation of power hydraulics lab; Prof. Kabir Dasgupta(PI), MME	DST
5	Augmentation of the research facility in the Department of Mechanical Engineering; Prof. S.N. Singh (PI); MECH	DST
6	Structural reformation of EnFloc for treatment of BOT water; Prof. Sagar Pal (PI); Chemistry	TSL
7	Laboratory testing of samples of construction materials; Prof. Sanket Nayak(PI); CE	BCCL
8	Environmental Management, Engineering Sciences; Prof. Anshumali (PI); ESE	DST(FICCI)
9	Evaluating basin-scale estimates of evapotranspiration using space-based observations; Prof. T.H. Syed (PI); AGL	DST
10	Identification of optimum blending ratio of two coals for Santaldih Thermal Power Station; Prof. Sumantra Bhattacharya (PI); FMME	WBPDCCL
11	Comparative assessment of coal combustion characteristics; Prof. Sumantra Bhattacharya (PI); FMME	WBPDCCL
12	Development of a non-invasive insulation diagnostic system for large power equipment employing cellulose impregnated with alternate dielectric liquid as its primary insulation taking into consideration the influence of trapped charge present in the system; Prof. Arijit Baral (PI); EE	DST
13	Nonlinear vibrations and instability analysis of composite structural elements through advanced shear-deformation theories and homogenization based damage model; Prof. Sarat Kr. Panda (PI); CE	SPARC
14	Developing a framework of critical indicators for success of remanufacturing in India; Prof. Sandeep Mondal (PI); MS	DST
15	Design and development of fiber ring loop down (FRLD) based monitoring system for roof safety measure in underground mines; Prof. Sanjoy Mandal (PI); EE	DST

Sl. No.	Title of the R&D Project; Name of PI/ Co-PI/Mentor; Department	Funded by
16	Machine learning based agriculture advent for farmer activity development in India: an application approach; Prof. Dharavath Ramesh (PI); CSE	DST
17	Development and field trial of 500 T capacity SAGES-III for use with continuous miners (phase-III); Prof. U. K. Singh (PI); ME	CIL
18	Model updating & aeroelastic control of delaminated aircraft structures; Prof. Prashanta K. Mahato (PI); MECH	DST
19	CO ₂ as a building block for the synthesis of fine chemical and fuel over functionalized materials; Prof. Biswajit Chowdhury (PI); Chemistry	DST
20	Syntheses of both enantiomers of carbohydrate-based organocatalysts and gelators from D- or L- arabinose and their applications in asymmetric organocatalysis; Prof. Somnath Yadav (PI); Chemistry	CSIR
21	Mathematical modeling of elastic waves in fractional order thermoelastic solids with micro-configurations and initially stressed media; Prof. Shishir Gupta (PI); M&C	CSIR
22	Evaluation of materials for concrete mix design M15, M20, M25 and M30; Prof. Sanket Nayak (PI); CE	RCPL
23	Identification and in vivo validation of c-Jun-N-terminal kinase 3 (JNK-3) inhibitors as novel therapeutics for neurodegenerative diseases; Prof. Parthasarathi Das (PI); Chemistry	DST
24	Supramolecular gelator for oil demulsification; Prof. Swapan Dey (PI); Chemistry	TSL
25	Design and development of a deployable thin-film based evanescent field sensor to check the quality of food from adulteration; Prof. S. K. Raghuwanshi (PI); ECE	CSIR
26	PAVITR – Potential and validation of sustainable natural & advance technologies for water & wastewater treatment, monitoring and safe water reuse in India; Prof. S. K. Gupta (PI); ESE	DST
27	Development of lizard-like robotic spy surveillance system; Prof. Ansuman Bhattacharya (Co-PI); CSE	DST
28	Preparation of master plan – 2030 for Dhanbad Municipal Corporation; Prof. V. G. K. Villuri (PI); ME	IIT(ISM) Dhanbad
29	Thermochemical convection in the earth's core with thermal core-mantle interaction; Prof. Swarandeeep Sahoo (PI); AGP	DST
30	Mix design for M25 and M30 concrete; Prof. S. S. Mohapatra (PI); CE	JSBCCL
31	Geophysical prospecting along northern fringes of Dalma volcanic around Kantaldih – Pharenga area; Prof. Shalivahan (PI); AGP	DAE
32	Preparation of high-resolution satellite images obtained from of CARTOSAT-2 satellite LISS-IV/LISS-V sensor on the scale of a cadastral map of Fe/Mn ore mines of SAIL; Prof. V. G. K. Villuri (PI); ME	SAIL
33	Investigation into the planning and design aspects governing the selective coal cutting technology using surface miner for various rock conditions for clean coal production; Prof. V. M. S. R. Murthy (PI); ME	DST
34	Scientific study regarding blast-induced ground vibration, control of flying fragment and blasting in the vicinity of the inhabited area of surface coal and bauxite mines; Prof. B. S. Choudhary (PI); ME	NALCO

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Sl. No.	Title of the R&D Project; Name of PI/ Co-PI/Mentor; Department	Funded by
35	Scientific study regarding blast-induced ground vibration, control of flying fragment and blasting of the vicinity of the inhabited area of stone quarries; Prof. B. S. Choudhary (PI); ME	RCPL
36	Scientific study on ultimate pit slope, dump slope and monitoring of slope stability at Dalurband O.C.P, Pandaveswar areas of Eastern Coalfield Limited (ECL); Prof. G. Budi (PI); ME	ECL
37	Development of cement-free concrete using GGBS and fly ash for civil infrastructures; Prof. Satadru Das Adhikary (PI); CE	TSL
38	Theatre and dance movement therapy as rehabilitative tools for people with mental retardation: an empirical study; Prof. Nirban Manna (PI); HSS	ICSSR
39	Scientific study regarding blast-induced ground vibration, control of flying fragment and blasting in the vicinity of the inhabited area of surface coal and bauxite mines; Prof. B. S. Choudhary (PI); ME	BCCL
40	Beneficiation and extraction of platinum and platinum group elements (PGE) from Mangalwedha soil; Prof. N. R. Mandre (Mentor); FMME	SERB, DST
41	Critical assessment of road network, pavement and its elements as per the relevant IRC and IS codal provisions; Prof. S. S. Mohapatra (PI); CE	L&T
42	Study and design of wideband conformal antenna based on dielectric resonator with high power handling capabilities; Prof. Raghvendra K. Chaudhary (PI); ECE	DRDO
43	Biogeochemical appraisal of the groundwater nitrate pollution due to agricultural activities in Son River Basin, India; Prof. Anshumali (PI); ESE	DST
44	Development of empirical relationship between proximate analysis and heat value of Patherdih reject coal; Prof. Shraavan Kumar (PI); FMME	BCCL
45	Solar driven community portable water purification system; Prof. Saravanan Pichiah (PI); ESE	DST
46	Modeling of wear in radial hydraulic turbine; Prof. Shibayan Sarkar (PI); MECH	DST
47	Development of a catalyst-reductant system to control NO _x emissions from lean-burn engines; Prof. Suresh Pandian E. (Mentor); ESE	IIT(ISM) Dhanbad
48	Modification of polysaccharides for various commercial applications; Prof. Sagar Pal (PI); Chemistry	HGCL
49	Designing trilingual dictionary of lesser-known Munda languages in Jharkhand: towards promotion and dissemination of indigenous knowledge and heritage; Prof. Rajni Singh (PI); HSS	ICSSR
50	Scientific study regarding blast-induced ground vibration, control of flying fragment and blasting in the vicinity of the inhabited area of surface coal mines in amalgamated NT-ST JG Colliery, Londa area and amalgamated Sudamdih-Patherdih Colliery, Eastern Jharia area; Prof. B. S. Choudhary (PI); ME	BCCL
51	On-chip silicon photonic switches for high-performance computing and datacentre networks; Prof. Devendra Chack (PI); ECE	DST
52	Development of signal processing framework for uplink/downlink of multi-cell multi-user massive MIMO-FBMC-OQAM based 5G communication system; Prof. Himanshu Bhusan Mishra (PI); ECE	DST

Sl. No.	Title of the R&D Project; Name of PI/ Co-PI/Mentor; Department	Funded by
53	Synergistic effects of nanoparticle and surfactant in the formation of nanoemulsion for application in enhanced oil recovery: experimental and molecular dynamic simulation studies; Prof. Ajay Mandal (PI); PE	CSIR
54	Multi-output series resonant inverter for non-contact heating in rural domestic cooking applications; Prof. D. V. Bhaskar (PI); EE	DST
55	Evaluation study of the central sector schemes for their continuation beyond 2019-20; Prof. R. M. Bhattacharjee (PI); ME	MoC
56	Mixture reliability analysis of remanufactured products; Prof. Sandeep Mondal (PI); MS	DST
57	Tinkering and innovation laboratory; HOC (CIIE)	NVF
58	Execution of a common approach for current sensor fault-tolerant control of induction motor drives in different control regimes; Prof. Sukanta Das (PI); EE	DST
59	Scientific study of slope stability etc. of KOCP, Kuya Colliery as per provision of Regulation no. 106 of Coal Mines Regulation 2017; Prof. G. Budi (PI); ME	BCCL
60	Study of impicator based lattice valued automata; Prof. S. P. Tiwari (PI); M&C	DST
61	Characterization and grading of coal samples received from the Office of the Coal Controllers, Ranchi, Jharkhand; Prof. Nikkam Suresh (PI); FMME	CCO
62	Metallogenetic evolution of gold (+ PGE) mineralization with implications for crust-mantle processes, invisible gold and role of organic matter linked to mineralization events in parts of Archean Singhbhum orogenic belts; Prof. Nikkam Suresh (PI); FMME	DST
63	Structural geometry, kinematics of deformation, grain-scale deformation mechanisms and geothermobarometry of the east-central part of the Mahakoshal belt, Central India: implication on the tectonic evolution of the Central Indian Tectonic Zone; Prof. M. K. Mukherjee (PI); AGL	DST
64	Influence of micro-domain phase variation on kinematic and metamorphic reactions in assessing petrological evolution of rocks; Prof. Upama Dutta (PI); AGL	DST
65	Mathematical modeling of concrete structures under combined blast and impact loading; Prof. Satadru Das Adhikary (PI); CE	DST
66	Characterization and assessment of utilization potential of coal for power plants; Prof. Shalini Gautam (PI); FMME	PTPP
67	Assessment of utilization potential of coal for power plants; Prof. Shalini Gautam (PI); FMME	OTPP
68	An investigation of the ergo-human model to evaluate the functional capacity of coal mine workers; Prof. Partha Sarathi Paul (PI); ME	DST
69	To conduct a research and development project on blast vibration study in stopping and development of both footwall and hang wall lode at Tummalapalle Mine; Prof. B. S. Choudhary(PI); ME	SMSL

Research, Development, Innovation & Entrepreneurship

Abbreviations:

BCCL	Bharat Coking Coal Limited
CCO	Coal Controller's Organisation
CIL	Coal India Limited
CSIR	Council of Scientific and Industrial Research
DRDO	Defence Research and Development Organization
DAE	Department of Atomic Energy
DST	Department of Science and Technology
ECL	Eastern Coalfield Limited
FICCI	Federation of Indian Chambers of Commerce and Industry
HGCL	Hindustan Gum & Chemical Limited
ICSSR	Indian Council of Social Science Research
JSBCCL	Jharkhand State Building Construction Corporation Limited
MoC	Ministry of Coal
NVF	Naresh Vashisht Foundation
NALCO	National Aluminium Company Limited
OTPP	Obra Thermal Power Plant
PTPP	Parichha Thermal Power Plants
RCPL	Rajbir Construction Private Limited
RCPL	Ramiya Constructions Private Limited
SMSL	Sancheti Mining Service Limited
SPARC	Scheme for Promotion of Academic and Research Collaboration
SERB	Scientific and Engineering Research Board
TSL	TATA Steel Limited
WBPDCCL	West Bengal Power Development Corporation Limited

AGL	Applied Geology
AGP	Applied Geophysics
CHE	Chemical
CHM	Chemistry
CE	Civil Engineering
CSE	Computer Science and Engineering
EE	Electrical Engineering
ECE	Electronics Engineering
ESE	Environmental Science and Engineering
FMME	Fuel, Minerals and Metallurgical Engineering
HSS	Humanities and Social Sciences
MS	Management Studies
M&C	Mathematics and Computing
MECH	Mechanical Engineering
ME	Mining Engineering
MME	Mining Machinery Engineering
PE	Petroleum Engineering
PH	Physics
HOC (CIIE)	Head of Centre (Centre for Innovation and Incubation Entrepreneurship)

3.3 State of the Art Labs, Research & Testing Facilities

Central Research Facility

Central Research Facility of IIT(ISM), Dhanbad has been established as a Centre of National Importance for Research and Creation. The constellation of high-quality equipment enabled with cutting edge technologies at a single location provides a scientific arena for the researchers. Sophisticated analytical instruments are vital for pursuing high-end research in areas of modern science and technology. Various advanced analytical instruments of CRF are operated and maintained by a dedicated and qualified group of Faculty members, Technical Officers, and Skilled Operators. It is an integral part of IIT(ISM), Dhanbad.

The primary objectives of the Central Research Facility of IIT(ISM), Dhanbad are:

- To establish state-of-the-art research facilities and instruments to support advanced research under one umbrella.
- To support and promote inter- and multidisciplinary research in contemporary and frontier areas.
- To enable Faculty members and research scholars of IIT(ISM), Dhanbad to access facilities of the most advanced class of instruments with minimum expenses.
- To provide high-end analytical instrumental facilities to researchers, scientists, and other users from academic institutes/R&D laboratories and industries to empower them to carry out different analyses for R&D work.

Major instrumental facilities at CRF are:

- Real-Time Simulator
- Single-Crystal X-ray Diffraction (SC-XRD)
- Advanced Air Bearing Rheometer
- Electron Probe Micro - Analyzer
- Field - Emission Scanning Electron Microscope (FE-SEM)
- Gas Sorption Analyser
- Multi-Angle Light Scattering Spectrometer (MALSS)
- Scanning Probe Microscopy (SPM)
- UV-vis- NIR Spectrophotometer
- High-resolution Transmission Electron Microscope (HRTEM)
- X-Ray Fluorescence (XRF) Spectrometer
- High-Resolution X-ray Diffractometer (HR-XRD)

Research, Development, Innovation & Entrepreneurship

State-of-the-Art Laboratories and Major Equipment/Setup/Software at Departments:

APPLIED GEOLOGY

State-of-the-Art Laboratories

- Marine and Isotope Geology Laboratory
- Photogeology & Digital Image Processing Laboratory
- Micropaleontology Laboratory
- Engineering Geology Laboratory
- FIST Laboratory
- Geochemistry Laboratory
- Hydrogeology Laboratory
- Structural Geology Laboratory
- Remote Sensing & Hydrology Laboratory
- Advanced Petrology Laboratory
- Geostatistics & GIS Laboratory
- Geocomputational Laboratory
- Mining Geology Laboratory
- Exploration Geology Laboratory
- Remote sensing Laboratory
- Isotope Geology Laboratory
- Petrology Laboratory
- Coal Geology & Organic Petrology Laboratory
- Fluid Inclusion Laboratory
- Isotope Geochemistry Laboratory

Equipment/Setup/Software

- Microwave Digestion System
- CHNSO Analyzer
- Trinocular Polarising Microscope and Stereo Zoom Microscope
- Stereo Zoom Binocular Microscope
- Magnetic Barrier Laboratory Separator
- Laboratory Jaw Crusher
- Grinder Polisher
- Vibratory Cup Mill
- Petrographic microscope
- Core Cutting and Grinding Machine
- Millipore Water Purification System
- VIDAR Select P36 Scanner
- Fume Hood with Built Blower
- Handheld/Portable UV Lamp with Automatic Safety Switch.
- Table Top Specimen Cutter
- Table Top Thin Sectioning Machine
- Leica DM 750R Student Microscope
- Linkam Fluid Inclusion Geothermometry Microscope
- Brazilian Test Apparatus, Point Load Strength Testing Machine and Soil Triaxial Testing Machine
- Refrigerated Research Centrifuge

APPLIED GEOPHYSICS

State-of-the-Art Laboratories

- Gravity Magnetic Data
- Instrumentation Laboratory
- Seismological Observatory
- Research Scholar's Laboratory
- Engineering Geophysics Laboratory
- Processing Laboratory
- Rock Physics Laboratory
- Potential Field Laboratory
- Coal Geophysics Laboratory
- Seismic Data Processing Laboratory

Equipment/Setup/Software

- Standard Proton Gradiometer
- Broadband Seismometer
- Digital Seismograph (24 channels)
- GSMP-35G v 8.0 Potassium Fast Reading Gradiometer
- Magnetic Susceptibility Meter
- Conductivity Meter
- 6TD Seismometer
- KT-20 Magnetic Susceptibility Meter
- Broadband Seismograph
- Global Positioning OEM GPS Board
- CG-5 Autograv Gravity Meter
- Fluke 51 11 thermometer
- Gradiometer with GPS and VLF Systems
- GSM-19T Standard Proton Magnetometer
- Micro-R-Survey Meter (Digital)
- Automated Permeability Meter / Porosimeter
- Static Cone Penetrometer
- 2Hz Vertical Geophones Geospace HS-1LT
- Ground Penetrating Rader (GPR)

CHEMICAL ENGINEERING

Equipment/Setup/Software

- Rotational Viscometer
- Gas Chromatograph
- CHNS Analyzer
- Particle Size Analyzer Zeta Sizer
- Quaternary UHPLC System along with all accessories
- Laboratory Density Meter
- Microprocessor Based Vibra-Cell Ultrasonic Probe
- High Pressure Fixed Bed Reactor
- TOC Analyzer
- Dy-Noy Tensiometer
- Particle Size Analyzer
- Modular Compact Rheometer
- TGA Thermostep Spectrometer
- Planetary Ball Mill
- High Performance, Bench Top Fourier Transform Infra-Red Spectrophotometer
- Gas Chromatograp

CHEMISTRY

Equipment/Setup/Software

- Surface Area and Porosity Meter Analyzer
- Scanning Electron Microscope
- Horiba Nano Particle Size Analyser
- Gas Chromatograph
- Fluorescence Spectrophotometer
- Polarimete
- UV-VIS Spectrophotometer
- Inert Atmosphere Glove Box and Accessories
- Electrochemical Workstation with Impendence Spectroscopy System
- Photo Lumines Spectrophotometer
- Photodiode Array UV-Vis Spectrometer

Research, Development, Innovation & Entrepreneurship

CIVIL ENGINEERING

Equipment/Setup/Software

- Automatic Recording Rain Gauge & Soil Tensiometer
- Carbonation Test Instruments for Concrete
- Controlled Servo-Hydraulic System
- Converging Flow Permeameter
- Digital Handled Temperature & Humidity Meter with Data Logger
- Digital Point Load Test Apparatus
- Direct Shear Test Apparatus
- Ductility Testing Machine
- Instron Accelerometer (Dynamic LVDT)
- Laboratory CBR Test Apparatus
- LOS Angles Testing Machine
- Plate Load Test Apparatus with Digital Data Acquisition System
- Reynolds Apparatus
- Soil Compaction Apparatus
- Static Cone Penetrometer
- Ultrasonic Pulse Velocity Tester
- Universal Testing Machine
- Venturi Meter Apparatus
- Benkelman Beam & Ratio Test Apparatus
- Concrete Mixture Rockwell Hardness Tester
- Digital Large Direct Shear Apparatus
- Crushing Value Apparatus
- Digital Marshal Apparatus & Penetrometer
- Digital Torsion Testing Machine
- Double Ring Infiltrometer Open Pan Evaporimeter
- Friction Losses Apparatus
- Jaw Crusher
- Laboratory Permeability Test Apparatus
- Parallel Flow Permeameter
- Portable Water Quality Analyzer with Accessories
- Rotational Viscometer
- Soil Density Apparatus
- Ultrasonic Dispersion Device
- Unconfined Compression Apparatus
- UV-VIS Spectrophotometer

COMPUTER SCIENCE & ENGINEERING

Equipment/Setup/Software

- National Instruments Compact-Rio (CC 2650 Wireless MCU LaunchPad development kit with accessories)
- High-End Server (PowerEdge FC640 Server Node with Windows Server 2016 standard, 16 core)
- NVIDIA QUADRO P4000

ELECTRONICS ENGINEERING

Equipment/Setup/Software

- Single Channel EPM series power Meter with 8481A Power Sensor
- Analog Signal generator
- Spectrum Analyser
- Handheld Network Analyser with 2 ports

- LCR Meter: 1 MHz to 3 MHz
- Electron Beam cum thermal evaporation system
- Spectrophotometer
- Analog Intensity Modulator
- Eleven Lab PCB Fabrication machine
- Mixed Signal Oscilloscope
- Optical Fibre Fusion Splice Machine with standard accessories
- Physical Modelling of Semiconductor devices
- SDN simulator
- Microwave Analog Signal Generator
- Advanced Design System
- Courtney Resonator 300C (up to 40 GHz)
- Optical Interrogator
- White light Source
- Photodetector
- Optical Spectrum Analyzer
- PNA Network Analyser with 2 ports
- Optical Time-domain Reflectometer
- MITS PCB Prototyping Machine
- Handheld Microwave Vector Network Analyzer, 9 GHz
- Economy Mechanical Calibration Kit

ELECTRICAL ENGINEERING

State-of-the-Art Laboratories

- Power System Laboratory
- Control Laboratory
- Circuits & Networks Laboratory
- Power Electronics Laboratory

Equipment/Setup/Software

- Real-Time Digital Simulator
- 3-Phase 5-Level Cascaded Inverter for Induction Motor Drive Set-up
- FPGA Based Vector Controlled Induction Motor Coupled with DC Generator Set-up
- Brushless Doubly-fed Reluctance Motor with Intelligent Power Module and Electronic Load Set-up
- HIL Controller Interface
- FPGA Based Switch Reluctance Motor Drive Set-up
- Squirrel Cage Induction Motor with Electronic Load Set-up
- DC-DC-Buck Boost Converter with R-Load

ENVIRONMENTAL SCIENCE & ENGINEERING

State-of-the-Art Laboratories

- Atomic Absorption Spectroscopy Laboratory
- Land-Use & Hydrogeology Laboratory
- Air Pollution Laboratory
- Advanced Industrial Waste Water Laboratory
- Environmental Microbiology Laboratory
- Instrumentation Laboratory
- Advanced Wastewater Engineering Laboratory
- Air Pollution and Computational Laboratory
- Applied Air and Soil Laboratory

Research, Development, Innovation & Entrepreneurship

Equipment/Setup/Software

- Double beam Atomic Absorption Spectro Photometer
- Global Positioning System
- Fluorescence Microscope
- Gas Chromatograph
- High-Performance Liquid Chromatograph
- Ozone Analyser
- Rotational viscometer
- Total Organic Carbon Analyser
- Ambient CO Analyser
- Elemental Analyser
- Electro-Chemical Work Station
- Fine Particulate Sampler
- GRIMM 1.109 aerosol spectrometer
- Microwave Digestion System
- Real-Time PCR
- Tube Luminometer
- UV-VIS Spectrophotometer

FUEL, MINERALS & METALLURGICAL ENGINEERING

Equipment/Setup/Software

- Jaw Crusher
- Laser Beam Particle Analyser
- Thermal Analyser DTA TGA DSC
- Calorimeter (Bomb Calorimeter)
- Thermogravimetric Analyser
- Horizontal Tube Furnace
- UV-VB Spectrophotometer
- Millipore Water Purification System
- Wet High-Intensity Magnetic Separator
- Roll Crusher
- Atomic Absorption Spectrophotometer
- CHNSO Analyser
- High-Temperature Furnace (consisting of two zones)
- Hydro Cyclone Test Rig
- Vertical Furnace (1600oC)
- Sample Divider
- Ultra-Centrifugal Mill

MANAGEMENT STUDIES

Equipment/Setup/Software

- Anemometer
- Baseline Leg/ Back/ Chest Dynamometer
- Chronoscope for Simple Reaction Time
- Digital Reaction Time Apparatus
- Goniometer
- Heart Rate Monitor
- Inclinator
- Precision Sound Level Meter
- Skin Thickness Measurement Instrument
- Electrical Ergo meter
- Anthropological Instrument
- Baseline Skin Fold Caliper
- Clinometer
- Dry and Wet Bulb Thermometer
- Hand Dynamometer
- Hydraulic Push-Pull Dynamometer
- Maximum-Minimum Thermometer
- Primavera Contractor
- Tachistoscope Apparatus (Electronic with variable time control)
- Visual Choice Reaction Time Apparatus

MECHANICAL ENGINEERING

State-of-the-Art Laboratories

- Heat and Mass Transfer Laboratory
- Non-traditional Machining Laboratory
- Micro Fabrication Laboratory
- Gas Sorption and Rheology Laboratory
- Thermal Engineering Laboratory
- Vibration Laboratory
- Dynamics of Machinery Laboratory
- Solid Mechanics Laboratory

Equipment/Setup/Software

- AVL Exhaust Gas Analyzer
- Roundness Tester
- Semi High-Speed Cryogenic Assisted Micro Machining
- Thermostatic Bath
- Exhaust Gas Analyzer
- MSC Nastran
- Rheometer with Data Acquisition System
- LS-DYNA Software

MINING MACHINERY ENGINEERING

State-of-the-Art Laboratories

- Power Hydraulics and Pneumatics Laboratory
- Fluid Flow Laboratory Electronics & Instrumentation Laboratory
- Mining Machinery Laboratory
- Advanced Research Laboratory
- Material Science and Geo-tech Laboratory

Equipment/Setup/Software

- Energy Efficient Series Parallel Hydraulic Excavator Set-Up
- Pin on Disc Wear Measuring Machine
- Core Cutting and Grinding Machine
- Real-time Power Electronics Hardware
- Three-Phase Power Analyser
- Human Vibration Analyser with Whole Body Seat Accelerometer
- Magnetic Particle Crack Detector
- Hydraulic Trainer
- Core Drilling Machine
- Automatic Compression Testing Machine
- Impedance Analyser (4 Hz -5MHz)
- Human Vibration Analyser with Hand Arm Tri-axial Accelerometer and Forced Transducer
- Ultrasonic Flaw detector
- Energy Efficient Hydraulic System using Hydraulic Intensifier and Accumulator with Leakage Simulation

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MINING ENGINEERING

State-of-the-Art Laboratories

- Rock Excavation Laboratory
- Mine Ventilation, CBM & Methane Drainage and Mine Radiation Laboratories
- Mine Surveying Laboratory
- Rock Mechanics Laboratory

Equipment/Setup/Software

- Bemek Rock Tester
- Universal Brittleness Test Apparatus
- Linear Cutting Rig (LCR) Setup
- Seismograph with High-frequency Borehole triaxial geophone
- Cavity Auto Scanner
- GNSS, GS16 Leica viva and Leica Geosystem
- Breathing Simulator
- Thermal Property Analyzer
- Portable Aerosol Spectrometer
- Universal Testing Machine
- Standard Test Sieve
- Mini Frac System
- Digital controller for MTS Machine
- "OYO" Sonic Viewer
- Automatic Drill Property Analysis System
- Geometrics Geode-8ch
- Slim Borehole Scanner
- Leica Total Station and Leica Geosystem
- Electronic Plotter (A0 Size)
- Gas Chromatograph
- Godbert-Greenwald apparatus
- Radon Measurement System
- Compression Testing Machine
- Tape Extensometer
- Stiff Testing Machine

PETROLEUM ENGINEERING

State-of-the-Art Laboratories

- Instrumentation Laboratory
- Chemical Flooding Laboratory
- Flow Assurance Laboratory
- Bioenergy Laboratory
- Drilling Fluid & Cement Slurry Laboratory
- Reservoir Characterization Centre
- Advanced Reservoir Laboratory
- Gas-Hydrate Laboratory
- Multiphase Flow Laboratory
- Product Testing Laboratory
- Reservoir Engineering Laboratory
- Coal Bed Methane Laboratory

Equipment/Setup/Software

- Particle Size Analyzer
- Rotational Viscometer
- High-Pressure Porosimeter
- Helium Porosimeter
- Planetary Ball Mill
- High-Pressure Syringe Pump
- Proximate Analyser
- Ruska Gas Permeameter

- Ruska Liquid Permeameter
- Multi-Fuel Analyser
- HPHT Autoclave Reactor-cum-Chiller
- Cold Finger Apparatus
- Syringe Pump
- Rotary Evaporator
- Gas Hydrate Autoclave
- High-Pressure High-Temperature Rheometer
- UV –VIS Spectrophotometer
- Spinning Drop Tensiometer
- Polarizing Microscope
- Emulsion / Electrical Stability Tester
- Photobioreactor
- Vacuum Oven
- Apparatus for Multiphase Flow
- 8- Speed Viscometer
- Autoclave
- TPH Analyser
- Two-phase Relative Permeameter
- FTIR Spectrophotometer
- Drop Shape Analyser
- Easy Dyne Tensiometer

3.4 Innovation, Incubation & Entrepreneurship

Centre for Innovation, Incubation and Entrepreneurship (CIIE) is a Not for Profit Centre under International Relations Alumni Affairs (IRAA) at IIT (ISM), Dhanbad, dedicated to promote Innovation and Entrepreneurship.

Mission:

To motivate, build and promote out of box thinking, development of innovative ideas. To build an environment that will facilitate the creation of social enterprise knowledge through research and empower students to apply their entrepreneurship abilities to develop solutions for greater social impact through academia.

THE ECOSYSTEM

CIIE aims to coordinate, synergize and leverage the various strands of excellence driving innovation and entrepreneurship in a thriving ecosystem consisting of research at the cutting edge of science and technology, a highly successful body facilitating industrial interactions, and incubation in sectors such as rural technologies, industrial solutions and social impact.

CIIE supports members of the IIT (ISM) including staff, students, alumni, faculties, and R&D partners, in creating successful business ventures that can translate benefits from technology and knowledge innovations to the society at large.

Different Sectors where incubation can be provided are among, but not limited to:

- Earth System Sciences (including Mining, Petroleum, Mineral, Geo-Physics, etc.)
- Information and Communication Technology
- Food, Agriculture & Allied Sectors
- Augmented Reality, Big Data and Analytics, Image processing and Recognition
- Cloud Computing
- Smart, Energy and Functional Materials
- Affordable Healthcare, Early detection of diseases, Drug design
- Water & Sewage Management
- Organic Electronics

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- Green Technology, Clean Energy, Renewable Energy, Non- Renewable Energy Sources

Major activities at CIIE:

- Creating a collaborative environment between industry and academia through joint research projects and consulting assignments.
- Facilitate knowledge creation, innovation and entrepreneurship activities.
- Physical infrastructure and support systems creation for business incubation activities. Foster and promote entrepreneurship spirit.
- Incubating early stage technology based innovative Intrepreneurial ventures.
- Encouraging and enabling the alignment of R&D activities to potential needs of the industry.
- Identifying technologies/innovations which have potential for commercial ventures.

Facilities to startups and incubates

CIIE provides office spaces, mentorship, introduction to angel investors and skill development workshops to potential startups and incubatees.

Details of Awards/Recognitions received by the Centre

- CIIE received this award to set up Incubation/Innovation Centre with a support of Rs. 2.5 crore in 5 years and up to Rs. 15 lakh as seed grant and monthly incentive to the selected incubatee by Atal Bihari Vajpayee Innovation Lab, Ranchi (SPV under Department of IT & e-Gov., Govt. of Jharkhand) under State Evaluation Board (SEB).
- CIIE is recognized as Host Institute for implementation of the scheme "Support for Entrepreneurial and Managerial Development of MSMEs through Incubator" by Ministry of Micro, Small and Medium Enterprises (MSME), Govt. of India.
- IIT (ISM) is awarded as the Best Performing Institution Innovation Council from the East Zone for the year 2018-19 by MHRD's Innovation Cell (MIC) on September 11, 2019.

PATENTS FILED:

S. No.	Application Number	Title; Inventor(s); Department
1	201931049978	A Machine Structure to Reduce Vibration of Micro-Milling Machine Prof. Vivek Bajpai; Mechanical Engineering
2	201931054793	Method for Real Time Monitoring of Liquid Level for wireless Transmission System Prof. Nirupama Mandal, Mr. Sayyed Faizan Ali, Research Scholar; Electronics Engineering
3	202031005648	Composite Material for Break Pad Prof. Subrata K. Ghosh, Mr. Santosh Kumar, Research Scholar; Mechanical Engineering

PATENTS PUBLISHED:

S. No.	Publication Number and Date	Title; Inventor(s); Department
1	201731035534 12.04.2019	Solar based hybrid heating system and method with automatic load impedance matching for low-wattage metallic appliances Prof. Pradip Kumar Sadhu; Electrical Engineering
2	201731041196 24.05.2019	Solar modules based heating system and method using mirrored current under impedance matched conditions. Prof. Pradip Kumar Sadhu, Apoorva, Prasenjit Das, Deepak Dash, Bidyadhar Subudhi, Pratik Biswas; Electrical Engineering
3	201731040658 17.05.2019	Solar Induction heating system using high frequency hybrid resonant inverter under VSI Mode. Prof. Pradip Kumar Sadhu, Paromita Sadhu, Achintya Goswami, Sarat Kumar Panda, Avik Datta, Ananyo Bhattacharya; Electrical Engineering
4	201731040664 17.05.2019	Solar Induction heating system using high frequency hybrid resonant inverter under ZSI Mode. Prof. Pradip Kumar Sadhu, Prof. Nitai Pal, Prof. Niladri Das, Pipul Roy, Aniruddha Bhattacharjee, Avijit Chakraborty, Electrical Engineering
5	201731041025 17.05.2019	Combined Solar and thermal system and method for heating metallic appliances under constant load conditions. Prof. Pradip Kumar Sadhu, Pipul Roy, Pratik Biswas, Pritish Ghosh, Sarat Kumar Panda; Electrical Engineering
6	201731040782 17.05.2019	Solar Induction heating system using high frequency modified half bridge series resonant inverter under VSI Mode Prof. Pradip Kumar Sadhu, Prof. Niladri Das, Parthabrata Choudhury, Moumita Sadhu, Suprava Chakraborty, Soumya Das; Electrical Engineering
7	201731040675 17.05.2019	Solar Induction heating system using high frequency modified half bridge series resonant inverter under CSI mode. Prof. Pradip Kumar Sadhu, Soham Dutta, Tamalika Panda, Paromita Sadhu, Palash Pal, Chayan Chakraborty; Electrical Engineering
8	201731040937 17.05.2019	A Photovoltaic integrated system and method for heating metallic appliances under variable load conditions. Prof. Pradip Kumar Sadhu, Anand Kumar, Shivprakash Bihari, Debabrata Roy, Tapas Roy, Arijit Chakrabarti; Electrical Engineering
9	201731040764 17.05.2019	Solar Induction heating system using high frequency modified half bridge series resonant inverter under ZSI mode. Prof. Pradip Kumar Sadhu, Rahul Raman, Chayan Chakraborty, Palash Pal, Bidrohi Bhattacharjee, Swapan Kumar Bakshi; Electrical Engineering
10	201731038017 03.05.2019	A Flocculant for the reduction of Pollutant content from mine process water Prof. Sagar Pal; Chemistry
11	201731034927 05.04.2019	Solar based hybrid heating system and method with variable load conditions for low-wattage metallic appliances Prof. Pradip Kumar Sadhu; Electrical Engineering

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S. No.	Publication Number and Date	Title; Inventor(s); Department
12	201731035228 05.04.2019	Solar based hybrid heating system and method with constant load conditions for low-wattage metallic appliances Prof. Pradip Kumar Sadhu; Electrical Engineering
13	201731040411 17.05.2019	Solar Induction heating system using high frequency hybrid resonant inverter under CSI Mode. Prof. Pradip Kumar Sadhu, Suman Kumar Laha, MD. Tabrez, Atif Iqbal, Ankur Ganguly, Ashok Kumar Naskar; Electrical Engineering
14	201831008017 06.09.2019	Novel System for regenerating and reusing nZVI/ZVI Particles in waste water treatment. Prof. Alok Sinha; Environmental Science & Engineering
15	201831022071 20.12.2019	Soya lecithin quantum dots as antiagglomerants and methodology of preparing the same Prof. Vikas Mahto; Petroleum Engineering
16	201831022160 20.12.2019	Biopolymeric Super absorbent hydrogel and its preparation thereof Prof. Sagar Pal; Chemistry
17	201831026697 24.01.2020	Process for the preparation of Noval sunflower oil derived gemini surfactants of non-ionic nature and compositions thereof for enhanced oil recovery application. Prof. Ajay Mandal; Petroleum Engineering

Startups supported by CIIE

S. No.	Name of Start-up	Team Leader	Details of Idea
1	Drone Eye	Mr. Sai Sumanth Kalluri	Surveying of mines and monitoring of slopes using drones equipped with LiDAR sensors.
2	Electric hybrid tricycle	Mr. Eklvya Singh	To provide a low cost alternative to electric wheelchairs for indoor and outdoor use. The product is a three-wheelchair which is both human powered and electric motor powered. A prototype is developed and Patent is to be obtained. The mass production will further reduce the costs.
3	Krishi Support (Gas Detection System)	Mr. Aman Gupta	The product will detect the different harmful gases present in mines nearby area and transfer the information through app on mobile.
4	Weplibox.com	Mr. Apoorv Varshney	This is online platform which provide review and detailed features of the content of a book, given by the expert of their field, which will help the user to read the best content according to their need.

S. No.	Name of Start-up	Team Leader	Details of Idea
5	World Build Supplier	Mr. Rajeshwar Yadav	It is an online platform which help to supply raw (construction) materials directly from source to the consumer without any involvement of third party at much less cost than market price.
6	Generating Electricity from Trees	Mr. Kamal Preet Singh Jassal	Use tree foliage as wind energy harvesting resource. Needs develop a grid to support the need of small locality.
7	Green Cigar	Mr. Kartik Sareen	Portable compressed oxygen mini-cylinder (of the size of cigar) will be developed. Can be used at rehabilitation centre.
8	Platform for Hobbyists to learn and earn	Mr. Saswata Som & Mr. Parth Khanna	Development of new platform for all the hobbyist to learn and earn.
9	There4u	Mr. Naman Khetan	AI based conversion of sign language to text and voice.
10	AI- based model photography	Mr. Hitesh Kumar	AI based model photography for clothing and fashion industry.
11	Bookspace	Mr. Apoorva Raj Bhadani	Web based solution for providing and sharing books.

Details of Faculty Entrepreneurship

S. No.	Name of Start-up	Team Leader	Department	Details of Idea
1	Aithingx Private Limited	Prof. Tarachand Amgoth	Computer Science & Engineering	An IoT and AI based startup which is dedicated to develop smart switch panel, smart lock and solar-based smart street lighting system along with real time air quality monitoring system.
2	Varnica Precision Private Limited	Prof Vivek Bajpai	Mechanical Engineering	This startup deals with Micromachining technique to machine hard metals such as titanium and Inconel alloys. It would be highly useful in aerospace, die and mold manufacturing, optic industries, bio-implant fabrication and household application like jewelry manufacturing.

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Others:

- A webinar was organised by MHRD's Innovation Cell (MIC) under India First Leadership Talk Series on "Innovation for Resurgent India" by Hon'ble HRD Minister Shri Ramesh Pokhriyal 'Nishank' on 22nd August, 2019 at Management Studies Hall, IIT(ISM), Dhanbad.
- Naresh Vashisht Centre for Innovation and Tinkering (NVCTI) has been established with an objective to inculcate innovation culture among the students and to provide a state of art workspace to transform ideas into product.

3.5 TEQIP – III

Equipment(s)/Software(s) worth Rs. 147 lakhs were procured during F.Y. 2019-2020.

S.No.	Store/Items	Store Location/ Department	Cost
1	e-Office	Computer Centre	27,77,720.00
2	High Temp. Furnace consisting of two zones	Fuel, Minerals & Metallurgical Engineering	2,29,275.00
3	Mass Flow Meters	Chemical Engineering	2,67,750.00
4	Experimental Set-up for Earthquake Simulation	Civil Engineering	9,71,250.00
5	Diamond coring tool DD 120-230V Chuck BI+ assy	Applied Geology	1,29,218.00
6	Setup for speed control of DC motor using Micro Controller and Study of IGBT	Mining Machinery Engineering	2,83,500.00
7	Automated Set-up Facility for the Performance Study of Heat Transfer Devices	Chemical Engineering	4,72,500.00
8	Gas Analyzer	Mech Engineering	11,22,187.00
9	Conductivity Meter	Applied Geophysics	3,46,500.00
10	Ambient Nox Analyzer	Environmental Science & Engineering	6,98,644.00
11	Bloomberg Terminal Database	Management Studies	22,60,140.00
12	44-inch wide format Plotter cum Scanner	Mining Engineering	9,26,100.00
13	Lumerical Academic Lab Suite Software	Electronics Engineering	9,98,025.00
14	NLOGIT 6 Software	Civil Engineering	81,163.00
15	RF Signal Generator	Electronics Engineering	2,30,790.00
16	Optical Chopper	Physics	76,440.00
17	NVIDIA GTX 2080Ti	Chemistry	1,06,050.00
18	Fluid Properties Apparatus	Chemical Engineering	3,08,595.00
19	Grammarly Software	Institutional Level	8,80,280.00
20	Survey Grade UAV	Mining Engineering	10,50,000.00
21	QChem Software	Chemistry	4,83,531.00
Total			1,46,99,658.00

Seven (07) Research Scholars received Fellowship/Assistantship during F.Y. 2019-20.

S. No.	Name of Research scholar	Admission No.	Department
1	Mr. Jagadish Kundu	2015DR0282	Applied Geology
2	Md Alamgir	2015DR0304	Mechanical Engineering
3	Mr. Sahil Sardana	16DR000279	Mining Engineering
4	Ms. Lalima Banerjee	17DR000383	Civil Engineering
5	Mr. Pankaj Pal	16DR000270	Computer Science and Engineering
6	Mr. Shakti Shankar Ray	2016DR0101	Physics
7	Mr. Joydip Dutta	2016DR0106	Physics

Following programmes (Symposium/Workshop/Invited Talk/Events etc.) were sponsored during F.Y. 2019-20.

Sl. No.	Name of the programme	Organizing Department	Date	No. of participants
1	International symposium on 5G Beyond for Rural Upliftment	Electronics Engineering	February 8-9, 2020	137
2	International workshop on "Precision Engineering & Management"	Mechanical Engineering	January 15, 2020	138
3	Workshop on "Waterjet Process & Related 4.0 Application"	Mechanical Engineering	December 7-8, 2019	122
4	Extra mural lectures on "Biodiesel Production from High FFA Waste Oil with Improved Costs"	Chemical Engineering	September 9, 2019	50
5	India First Leadership Talk Series	CIIE	April 22, 2019	70
6	Two day workshop- "Strengthening Career Prospects with Communication & Presentation Skills"	Humanities & Social Science	October 7-8 & October 19-20, 2019	167
7	Extra mural lectures on "Ultra-Assisted Photo Catalytic Dissociation of Water for Hydrogen Using Solar Radiation"	Chemical Engineering	July 3, 2019	39
8	"Internal Hackathon"	Computer Science and Engineering	January 17-19, 2020	240

4. Industry- Institute Interactions

4.1 Consultancy Projects

In the area of Industry - Institute Interaction, IIT (ISM) is very active. There has been a steady growth over the years in the sponsored projects, financial outlay and external cash flow through consultancy and professional development programmes offered to various Industries and Organizations.

The total value of Consultancy projects undertaken during the year 2019-20 amounted to Rs. 345.19 Lakhs.

S. No.	Title, Faculty Member and Department	Client
1	Preliminary screening of EOR for Selan's Bakrol and Lohar Oil & gas fields of Cambay Basin; Prof. Keka Ojha (CI), Prof. Ajay Mandal (Co-CI), Prof. Vikas Mahato (Co-CI), Prof. Neetish Kumar Maurya (Co-CI); PE	SELAN Exploration Technology Limited.
2	Random verification of air sample for Cluster-III group of mines, BCCL; Prof. Manish Kumar Jain (CI); ESE	Bharat Coking Coal Limited
3	Air sampling in core and buffer zone at Sijua area, BCCL; Prof. Manish Kumar Jain (CI), Prof. Vipin Kumar (Co-CI); ESE	Bharat Coking Coal Limited
4	Designing a framework of key drivers and performing a corporate social audit for Corporate Social Responsibility (CSR) initiatives on local development and economic performance in Eastern Coalfields Limited (ECL); Prof. Niladri Das (CI), Prof. Chandan Bhar (Co-CI), Prof. Shashank Bansal (Co-CI); MS	Eastern Coalfields Limited
5	Proof checking of 6 nos. minor bridge in connection with Construction of railway formation, major & minor bridges, laying of railway tracks including supply of P-way fittings in connection with new railway siding for Sonapur Bazar Project of ECL near Pandabeswar, West Bengal; Prof. Sekhar Chandra Dutta (CI); CE	Rites Ltd., Ministry of Railway
6	Proof checking of 6 nos. minor bridge & 4 nos. bridges of upcoming railway infrastructure for RTPS/DVC at Raghunathpur; Prof. Sekhar Chandra Dutta (CI); CE	Rites Ltd., Ministry of Railway
7	Development of an underwater drilling and controlled blasting methodology for dismantling concrete berths (EQ2-EQ5) at Port of Visakhapatnam; Prof. V. M. S. R. Murthy (CI); ME	ITD Cementation India Ltd.

Industry- Institute Interactions

S. No.	Title, Faculty Member and Department	Client
8	Scientific Study for controlled blasting on developed galleries at Bhowra (South) colliery O/C (both coal and OB), BCCL; Prof. Bhanwar Singh Choudhary (CI); ME	Bharat Coking Coal Limited
9	Scientific Study for Establishing controlled Blasting practice at Bhadhokhara stone mine located in Block 2 of M/s Balmiki Prasad; Prof. Bhanwar Singh Choudhary (CI), Prof. V. M. S. R. Murthy (Co-CI); ME	M/s Balmiki Prasad, Nawada.
10	Correlation Survey at newly sunk return shaft at Moonidih XV seam, Dhanbad; Prof. Dheeraj Kumar (CI); ME	Indu SCCL CGME Consortium
11	Field investigations, modelling and simulation studies for reorganizing the ventilation system to improve the workplace environment for the workings of Khetri and Banwas North Block at Khetri Copper Mine of Hindustan Copper Ltd. Rajasthan; Prof. Durga Charan Panigrahi (CI), Prof. Patitapaban (Co-CI) Sahu, Prof. Dipankar Roy (Co-CI); ME	Hindustan Copper Ltd.
12	Evaluation of liquefaction potential for upgradation of Patna Medical College and Hospital, Patna under PMSSY (Phase-IV); Prof. Rajib Sarkar (CI); CE	C. K. Constructions
13	Vetting of structural design & drawing of minor bridges, culverts & VUPs; Prof. Sarat Kumar Panda (CI); CE	National Highways Authority of India
14	Mix design of M25 and M30 grade of concrete; Prof. Sarat Kumar Panda (CI); CE	National Thermal Power Corporation Ltd.
15	Proof checking & scrutiny of designs and drawings of minor bridges in connection with NTPC-LARA Project; Prof. Sekhar Chandra Dutta (CI); CE	National Thermal Power Corporation Ltd.
16	Consultancy services for condition assessment and preparation of the detailed project report for repair and retrofitting works of Baghajatin ROB & Chingrighata Bridge, Kolkata; Prof. Sukanta Chakraborty (CI); CE	BSEC-SGRL (JV)
17	Proof checking of structural design of 5.48 metre wide foot over bridge at NSCB Gomoh Junction Station; Prof. Sukanta Chakraborty (CI); CE	East Central Railway, Dhanbad Division.

S. No.	Title, Faculty Member and Department	Client
18	Scientific study for long term stability of pillars in Mugma Special Seam and BP seam, Khoodia Colliery, ECL; Prof. Upendra Kumar Singh (CI); ME	Eastern Coalfields Limited
19	Independent evaluation and assessment of major central sector schemes of Ministry of Coal: Research & Development (S & T); Prof. V. M. S. R. Murthy (CI); ME	Ministry of Coal, Govt. of India
20	Scientific study for establishing controlled blasting practice at Bhadhokhara stone mine located in block 4 of M/s Vibharaj Construction Pvt. Ltd; Prof. V. M. S. R. Murthy (CI), Prof. Bhanwar Singh Choudhary (Co-CI); ME	M/s Vibharaj Construction Pvt. Ltd.
21	Design work for oil removal system for equalization tank with 2 options: Still central concentric tube system and gun-barrel tank system along with full details, isometric & feasibility system; Prof. Ajay Mandal (CI), Prof. Chandan Guria (Co-CI); PE	Mahima Udyog, Haridwar
22	Scientific study for controlled blasting at 3rd patch and Shatabdi patch of Muraidih Colliery, Barora Area, BCCL; Prof. Bhanwar Singh Choudhary (CI); ME	Bharat Coking Coal Limited
23	Scientific study for ongoing fire due to illegal mining at Kuju Colliery of Kuju area, CCL around old and new NH-33 diversion road in XII seam and its remedial solutions to safeguard new NH-33 diversion road; Prof. Devi Prasad Mishra (CI), Prof. V. K. Sinha (Co-CI); ME	Central Coalfields Limited
24	Geo-Identification & demarcation of area under Malanjhand copper mining lease by cadastral survey and preparation of digital geo-referenced map & generation of Geo-referenced shape files by DGPS Survey of that Area; Prof. Dheeraj Kumar (CI), Prof. V. G. Villuri (Co-CI); ME	Hindustan Copper Ltd.
25	Field investigations, modelling and simulation studies for designing the ventilation system of Sindesar khurd (SK) mine, Hindustan Zinc mine, Rajasthan; Prof. Durga Charan Panigrahi (CI); ME	Hindustan Zinc Ltd. Udaipur
26	Environment audit for 4X250 MW TPP Rab Dum area and coal washery followed by audit report preparation for 2019-20; Prof. Gurdeep Singh (CI); ESE	Jindal Power Limited, Tammar
27	Preliminary screening of EOR for Selan's Bakrol and Lohar Oil & gas fields of Cambay Basin - Phase-II; Prof. Keka Ojha (CI), Prof. Ajay Mandal (Co-CI), Prof. Vikas Mahato (Co-CI), Prof. Neetish Kumar Maurya (Co-CI); PE	SELAN Exploration Technology Ltd.
28	Study on whole body vibration of HD785 Komatsu Dumper; L Prof. A. Kumaraswamidhas (CI); MME	Larsen & Toubro Construction
29	Petrography and mineral chemistry (using EPMA) of Ruby and associated host rocks for Montepuez Ruby mining (A Gemfield Group Company) and implications for exploration; Prof. Prabodha Ranjan Sahoo (CI), Prof. A. S. Venkatesh (Co-CI); AGL	Montepuez Ruby Mining

Industry- Institute Interactions

S. No.	Title, Faculty Member and Department	Client
30	Field scale simulation study and production forecasting for a part of Sohagpur west CBM Block of Reliance Industries Limited (RIL); Prof. Rajeev Upadhyay (CI), Prof. Saurabh Datta Gupta (Co-CI); PE	Reliance Industries Limited
31	Proof checking of balance 05 Nos minor and 01 major bridge in connection with construction railway formation major and minor bridges, laying of railway tracks including supply of P-way fittings in connection with new railway siding for Sonepur Bazari Project of ECL near Pandebeswar, West Bengal; Prof. Sekhar Chandra Dutta (CI); CE	Rites Limited Kolkata
32	Integrated Geophysical study for ground-water potential at Karmatand Township of BCCL; Prof. Sanjit Kumar Pal (CI); AGP	Bharat Coking Coal Limited
33	Vulnerability assessment and suggesting the possible remedial measures for damaged stair case and columns of Koyla Bhawan at Koyla Nagar, BCCL, Dhanbad; Prof. Sanket Nayak (CI), Prof. Sarat Kumar Panda (Co-CI); CE	Bharat Coking Coal Limited
34	Vetting of design and drawing of critical & important civil structure of Petroleum Depot at Bokaro, Jharkhand; Prof. Sarat Kumar Das (CI), Prof. Sarat Kumar Panda (Co-CI), Prof. Sukanta Chakraborty (Co-CI), Prof. Sanket Nayak (Co-CI), Prof. Lohitkumar Nainegali (Co-CI), Prof. Smruti Sourava Mohapatra (Co-CI); CE	Bharat Petroleum Corporation Limited.
35	Construction of source (Intake Well) in Maithan and Panchet dam for drinking water system for multi villages of Nirsa-Govindpur (North and South); Prof. Sarat Kumar Das (CI), Prof. Sarat Kumar Panda (Co-CI), Prof. Sukanta Chakraborty(Co-CI) and Prof. Rajib Sarkar (Co-CI); CE	DW & S Circle, Dhanbad
36	Vetting of proposed Police Training School(PTS), Jharoda Kalan, New Delhi; Prof. Sarat Kumar Panda (CI), Prof. Sanket Nayak (Co-CI); Prof. Sarat Kumar Das (Co-CI), CE	CE Con Engineering
37	Coal quality evaluation for pricing purpose; Prof. Sumantra Bhattacharya (CI), Prof. Barun Kumar Nandi (Co-CI), Prof. Shravan Kumar (Co-CI), Prof. Pankaj Kumar Jain (Co-CI); FMME	PWC
38	Preparation of technical report on 'Solid Classification System' developed by M/s Terex India Private Limited; Prof. Sumantra Bhattacharya (CI), Prof. S. Seetharaman (Co-CI), Prof. Shravan Kumar (Co-CI); FMME	TEREX, India Private Limited, Bangalore
39	Vetting of structural drawings & designs (substructure and foundations) of major bridges for the proposed 3rd line (between Narayangarhand Bhadrak) in the state of West Bengal & Odisha; Prof. Tanish Dey (CI), Prof. Rajib Sarkar (Co-CI), Prof. Sukanta Chakraborty (Co-CI); CE	M/s C. E. Testing Company Pvt. Ltd., Kolkata.

4.2 Testing Projects

The total value of testing projects undertaken during the year amounted to Rs. 36.27 Lakhs.

S. No.	Title of Project, Faculty Member and Department	Client
1	A study into the performance and behaviour of mine ventilation and safety instruments and analysis and interpretation of air samples, and functionality study of SCSRs of ECL mines (Khottadih Colliery, Bankola Colliery, Khodia Colliery, Shyampur-B Colliery Chaupapur Colliery, Dubeswari Colliery, Shyamsundarpur Colliery, Kenda Area, SSI Colliery SCSRs of different mines) of ECL; Prof. Durga Charan Panigrahi (CI); ME	Eastern Coalfield Limited
2	A study of performance and behavior Self Contained Self Rescuers (SCSRs) by full bench tests as per IS 15803:2008 and adopted by DGMS for the samples approved by Western Coalfields Ltd., Nagpur; Prof. Durga Charan Panigrahi (CI), Prof. Patitapaban Sahu (Co-CI); ME	Western Coalfields Ltd.
3	A study into the performance and behavior of mine ventilation and safety instruments including the functionality of self contained chemical self rescuers (SCSRs) of SECL mines (Baherabandh Colliery, Bishrampur Area, Bhatgaon Area and Korba Area), South Eastern Coalfields Limited; Prof. Durga Charan Panigrahi (CI), Prof. Patitapaban Sahu (Co-CI); ME	South Eastern Coalfields Limited
4	A study into the performance and behavior of mine ventilation and safety instruments including the functionality of self contained chemical self rescuers (SCSRs), and analysis and interpretation of fire area and general body air samples of BCCL mines (Bhagaband Colliery, Mines Rescue Station-Dhansar, Moonidih Colliery, AKWM Colliery, Phularitand Colliery, 10/12 Pits K.B. Colliery, Gopalichuk Colliery, Bera Colliery), Bharat Coking Coal Ltd; Prof. Durga Charan Panigrahi (CI), Prof. Patitapaban Sahu (Co-CI); ME	Bharat Coking Coal Ltd.
5	Proximate analyses at equilibrated condition (40 degree & RH = 60%) on the coal sample received from the office of coal controller, Dhanbad; Prof. Nikkam Suresh (CI), Prof. Vinod Kumar Saxena (Co-CI); FMME	Office of coal controller, Dhanbad
6	Proximate, VM (dmf) GKLT, CSN, GCV (dmf), and GCV analyses at equilibrated condition (40 degree & RH = 60%) on the coal sample received from the office of coal controlled, Dhanbad; Prof. Nikkam Suresh (CI), Prof. Vinod Kumar Saxena (Co-CI); FMME	Office of coal controller, Dhanbad
7	Testing of Dust Suppression Ionizer Chemical (DUSCON); Prof. Sukha Ranjan Samadder (CI); ESE	Fire safety devices Pvt. Ltd; Faridabad

Industry- Institute Interactions

S. No.	Title of Project, Faculty Member and Department	Client
8	Ultimate analysis of 4 samples of Durgapur Thermal PS, DVC; Prof. Vinod Kumar Saxena (CI); FMME	Durgapur Thermal PS, Damodar Valley Corporation
9	Ultimate analysis of 3 samples of Durgapur Steel Thermal PS, DVC; Prof. Vinod Kumar Saxena (CI); FMME	Durgapur Steel Thermal PS, Valley Corporation
10	Ultimate analysis of 2 samples of BTPS, DVC; Prof. Vinod Kumar Saxena (CI); FMME	Bokaro Thermal Power Station, Damodar Valley Corporation
11	A study performance and behaviour self contained self rescuers (SCSRs) by full bench test as per IS 15803:2008 and adopted by DGMS for the Samples Approved by WCL Nagpur; Prof. Durga Charan Panigrahi (CI); ME	Western Coalfields Ltd.
12	Ultimate analysis including GCV of 6 nos. coal samples; Prof. Vinod Kumar Saxena (CI); FMME	DVC Mijia Thermal Power Station Bankura (W.B.)
13	Ultimate analysis testing of CTPS unit no 7 & 8 station coal sample; Prof. Vinod Kumar Saxena (CI); FMME	Chandrapura Thermal Power Station

4.3 Professional Development Programmes

IIT (ISM), Dhanbad continuously offer professional development programmes in the core areas of its competence for the executives of different companies and others.

The total revenue generated from various sectors is Rs 340.33 Lakhs.

S. No.	Title of the Programme	Name of Coordinator	Name of the Deptt.
1	Advanced Geological Technology for the executives of Tata Steel.	Prof. A. S. Venkatesh (CI), Prof. M. K. Mukherjee (Co-CI), Prof. Sahendra Singh (Co-CI), Prof. Prabodha Ranjan Sahoo (Co-CI)	AGL
2	Enhancing Work Efficiency through Ethics and Values	Prof. Ajit Kumar Behura (CI), Prof. Sarita Kaur (Co-CI)	HSS
3	Controlled Blasting Management and Safety for Road Construction in Himalayan Territory	Prof. Arvind Kumar Mishra (CI), Prof. B. S. Choudhary (Co-CI)	ME
4	Safety in Usage of Bulk Explosives and Initiating Systems in Opencast Coal Mines	Prof. Arvind Kumar Mishra (CI), Prof. R. M. Bhattacharjee (Co-CI)	ME
5	Introduction to R-programming Language for Geo-statistical Data Analysis	Prof. B. C. Sarkar (CI), Prof. Dipankar Roy (Co-CI)	AGL
6	Drilling & Blasting Techniques for Surface & Underground Excavations (for the Executives of NHPC Ltd.)	Prof. B. S. Choudhary (CI)	ME
7	Mining and Environmental Aspects of the Industry	Prof. Biswajit Paul (CI)	ESE
8	Project & Financial Management with Application Software for DVC Executives.	Prof. Chandan Bhar (CI), Prof. Sandeep Mandal (Co-CI), Prof. Niladri Das (Co-CI)	MS
9	Mines Training Programme for the Executives of Apollo Tyres Ltd.	Prof. Devi Prasad Mishra (CI), Prof. L. A. Kumaraswamidhas (Co-CI)	ME
10	2 nd National Symposium on Developing Indo-Australian Collaboration for Sustainable Mining in India.	Prof. Dheeraj Kumar (CI)	ME
11	Modern Mine Surveying Techniques	Prof. Dheeraj Kumar (CI), Prof. Vasanta Govind Kumar Villuri (Co-CI)	ME

Industry- Institute Interactions

S. No.	Title of the Programme	Name of Coordinator	Name of the Deptt.
12	Informal Learning Opportunity for the Officials of the Ministry of Mines & Petroleum (Afghanistan)	Prof. Dheeraj Kumar (CI)	ME
13	Two Days Training Workshop at Donimalai Project on EIA/Auditing of Mining Projects for NMDC Personnel	Prof. Gurdeep Singh (CI)	ESE
14	Condition Based Maintenance of Equipment.	Prof. L. A. Kumaraswamidhas (CI), Prof. Jayanta Das (Co-CI)	MME
15	One week Training Programme on Mining and Environment.	Prof. Manish Kumar Jain(CI)	FMME
16	Advanced Course on Coal and Mineral(s) Beneficiation for the Executives of the Tata Steel.	Prof. Nikkam Suresh (CI), Prof. R. Venugopal (Co-CI), Prof. Anand Anupam (Co-CI), Prof. Salini Goutam (Co-CI)	FMME
17	Project and Financial Management with Application Software for ECL Executives.	Prof. Niladri Das (CI), Prof. Sandeep Mandal (Co-CI)	FMME
18	Two weeks Customized Executive Development Program on Electro-Hydraulics for the Executives of M/S Tata Steel.	Prof. Niranjan Kumar (CI), Prof. Kabir Dasgupta (Co-CI), Prof. Jayant Das (Co-CI)	MME
19	Development of Approach and Methodology for Environmental Performance Rating Index (ERPI) for Coal Mines, Coal India Ltd. with reference to air quality.	Prof. Prasoon Kumar Singh (CI), Prof. Manish Kumar Jain (Co-CI)	ESE
20	One week Customized Executive Development Programme on Machine Lubrication. (For the Executives of Tata Steel)	Prof. Subrata Kumar Ghosh (CI), Prof. Niranjan Kumar (Co-CI)	MECH
21	Professional Development Programme on Management and Advances in Underground and Surface Mining Technology. (For the Executives of Tata Steel)	Prof. Rabindra Kumar Sinha (CI), Prof. B. S. Choudhary (Co-CI)	ME
22	Training Programme on Safety and Maintenance Aspects of Mining Machineries for Mechanical and Electrical of NTPC (Dulanga Coal Mining Project, Uttar Pradesh).	Prof. Rashmi Ranjan Das (CI), Prof. A. K. Mukhopadhyay (Co-CI)	MME

S. No.	Title of the Programme	Name of Coordinator	Name of the Deptt.
23	Controlled Blasting Management for Road Construction in Himalayan Territory.	Prof. Arvind Kumar Mishra (CI), Prof. B. S. Choudhary (Co-CI)	ME
24	Enhancing Work Efficiency through Ethics and Values	Prof. Sarita Kar (CI), Prof. Ajit Kumar Behura (Co-CI)	HSS
25	Emerging Technologies for Mining Industry	Prof. Sheo Shankar Rai (CI), Prof. Haider Banka (Co-CI)	ME
26	Controlled Blasting Management for Road Construction in Himalayan Territory	Prof. Arvind Kumar Mishra (CI)	ME
27	Competency Development of Reservoir Engineers	Prof. V. P. Sharma (CI), Prof. Rajeev Upadhyay (Co-CI), Prof. Ajay Mandal (Co-CI), Prof. Chandan Guria (Co-CI)	PE

5. International Relations & Alumni Affairs (IR&AA)

5.1 International Relations

Academic and Research Collaborations MoU/Agreement Signed with Foreign Universities during 2019-20:

Name of the University	Country
Ecole Centrale de Nantes	France
Uit The Arctic University of Norway	Norway
Jashore University of Science and Technology, Jashore	Bangladesh

List of active International collaboration as on 31.03.2020

Name of the University	Country
Texas Tech University	USA
University of Wollongong	Australia
Safety in Mines, Testing & Research Station (SIMTARS)	Australia
University of New South Wales	Australia
University of South Florida	USA
University of Queensland	Australia
Perm National Research Polytechnic University (PNRPU), Perm	Russia
Politecnico Di Torino (Dept. of Mechanical and Aerospace Engineering)	Italy
Laurentian University	Canada
LUCAS -UGTC	Australia
Institute of Technology Petronas SDN BHD	Malaysia
VSV- Technical University of Ostrava	Czech Republic
CTIF Global Capsule (CGC), Aarhus University, Herning	Denmark
Politecnico di Milano	Italy
Mazoon College, Muscat	Oman
Instituto Superior Tecnico, Lisbon	Portugal
Slovak University of Technology, Bratislava	Slovakia
Ecole Centrale de Nantes	France
Arctic Universities of Norway	Norway
Jashore University of Science and Technology, Jashore	Bangladesh
National United University	Taiwan

Collaborations details:

- Indo-Russia bilateral project (DST and RSF funded) has been received on 01.07.2019 where Prof. Biswajit Chowdhury is coordinator from India.

Details of Jointly organized International Conference/event during F.Y. 2019-20.

- TEQIP funded International Workshop on Waterjet processes and related 4.0 applications held on 07.12.2019.
- National Symposium on Advanced Technology Infusion for Sustainable Mining (January 12, 2020, CIL Kolkata and January 18, 2020, IIT (ISM) Dhanbad) in collaboration with RMIT University and CSIRO Australia.

International Relations & Alumni Affairs (IR&AA)

International Research Internship undertaken by students during F.Y. 2019

- There were 82 numbers of outgoing student mobility from IIT(ISM) Dhanbad at UG/PG/PhD level for the said period.

Faculty and student mobility under different academic and research collaboration Programme(s) during F.Y. 2019-20.

- 06 numbers of International students took admission in PG programs in various disciplines.
- Emeritus Professor Seshadri Seetharaman of Royal Institute Technology Stockholm, Sweden has joined the Department of FMME as International Visiting Professor on 18.01.2020.
- Prof. Jay Pulliam of Baylor University, Texas, USA, Department of Geosciences visited IIT (ISM) Dhanbad as Distinguished Fulbright-Nehru Chair Professor for six months from 21.07.2019 to 30.12.2019.
- Ongoing Erasmus+ Programme with Poznan University of Technology, Poland.

Other significant achievements:-

- The first official newsletter of IIT(ISM) was released on November 14 2019. The newsletter will be issued quarterly and will contain updates on the recent developments, events and news from IIT(ISM).
- Beta version of the website of International Relation is launched.

5.2 Alumni Affairs

Reunion Events and Activities of different Alumni Chapters

- A reunion event- Ruby jubilee meet of 1979 batch is organized at IIT (ISM) Dhanbad during 16th-17th November 2019.
- A reunion event- Silver jubilee meet of 1994 batch is organized at IIT (ISM) Dhanbad during 28th -29th December 2019.
- Oman get-together was attended by 18 IIT(ISM) Alumni from Batches of 1978 to 2009 and their families at Oman by Middle East Alumni Association on October 11 2019.
- ISMAA Bangalore Chapter organized its annual get-together at Bengaluru on October 12 2019.
- ISMAA Mumbai Chapter organized its annual get-together at Mumbai on January 19 2020.

- Middle East Alumni Annual Reunion is organized at Dubai on February 28 2020.
- The batch of 1960 and 1970 participated as special guests during the BASANT.
- Director IIT(ISM), along with Dean (IRAA), visited Sydney, Perth and Brisbane, Australia to explore and extend possible collaboration of IIT(ISM) with Australian Universities and R&D centers during the period July 10 – July 17 2019. They also liaise with our alumni at Perth (July 10 2019) and Brisbane (July 13 2019).

Alumni Visit

- Shri Anil Kumar (B. Tech., Petroleum Engineering, 1965) – CEO, OMAK Technology LLC, Texas, USA and member of IIT (ISM) Dhanbad Alumni Association North America (ISMAANA).
- Shri Amit Sinha (B. Tech., Mining Engineering, 2000) – CEO, Paytm Mall and Vice President- Business planning and people for One 97 Communication Limited.
- Shri Abhijit Deonath (M. Sc. Tech., Applied Geology, 1991) - Director, Producer, and Music Composer of the Oscar-nominated film Salt Bridge - Hindi Movie
- Dr. Kalachand Sain (M. Sc. Tech, Applied Geophysics, 1988) - Director of Wadia Institute of Himalayan Geology, Dehradun.
- Dr. Akhil Datta-Gupta (B. Tech., Petroleum Engineering, 1982) – Regents Professor, University Distinguished Professor and holder of the L.F. Peterson '36 Endowed Chair in the Harold Vance Department of Petroleum Engineering at Texas A&M University, USA.
- Shri Omkar Nath Gyani (B. Tech., Petroleum Engineering, 1987) – GGM & Head, Institute of Reservoir Studies, ONGC, Ahmedabad.
- Shri Naresh K Vashisht (B. Tech., Petroleum Engineering, 1967) – President, Omimex Resources, Inc., Texas, USA
- Shri Dipak Sarkar (B. Tech., Petroleum Engineering, 1967) – Ex-Senior Petroleum Consultant, Energy Analysts International, Denver, USA
- Dr. Mihir K Sinha (B. Tech., Petroleum Engineering, 1966) – Founder, IFTC, LLC., Plainsboro, NJ, U.S.A
- Dr. Ganesh Thakur (B. Tech., Petroleum Engineering, 1970) - Director of Energy Industrial Partnerships & Distinguished Professor of Petroleum Engineering at the University of Houston. Former Vice President, Chevron Corporation, USA.

List of the Awards/Scholarships Instituted under IRAA

S. No.	Name of the Award/Scholarship	Sponsoring Agency	Discipline	No. of Award	Type of award
1	Manjit K. Memorial Award (MGM)	ISMAANA	Petroleum Engg.	1 (first year)	Citation and a cash prize
2	Pramod and Meera Thakur Trust (PMTT)	ISMAANA	Mining Engg.	1 (first year)	Citation and a cash prize
3	Srimati Sushila Devi Tulli Memorial (SDTM)	ISMAANA	Petroleum Engg.	1 (first year)	Citation and a cash prize
4	Dipak and Chitra Sarkar	ISMAANA	Any branch of Engg.	1 (first year)	Citation and a cash prize
5	Zoeb and Shera Mogri	ISMAANA	AGL, AGP & Any	1 (first year)	Citation and a cash prize
6	Chugh Family Foundation	ISMAANA	Any branch of Engg. (Preferably Female)	4 (one each in first, second, third & fourth year)	Citation and a cash prize
7	Peggy and Avinash Ahuja	ISMAANA	Any branch of Engg.	10 (2 in first, 2 in second, 3 in third, 3 in fourth year)	Citation and a cash prize
8	Diwan Chand Gupta Memorial & Lila Vati Gupta Memorial	ISMAANA	Female students of any branch Preferably in SC/ST/OBC categories	2 (first year)	Citation and a cash prize
9	Balkrishna and Prakash Agarwal Memorial	ISMAANA	Mining Engg.	1 (first year)	Citation and a cash prize
10	Atul Arya	ISMAANA	Any branch of Engg.	1 (first year)	Citation and a cash prize
11	Sriram Muralidharan	ISMAANA	Electronics Engg.	1 (first year)	Citation and a cash prize
12	Naresh Vashisht Foundation	ISMAANA	All Disciplines	20 (5 in each year)	Citation and a cash prize
13	Mahendra Verma	ISMAANA	All Disciplines	1 (For first year)	Citation and a cash prize
14	Neelima Verma	ISMAANA	All Disciplines	1 (For third year)	Citation and a cash prize
15	Raj Prasad Excellence in Teaching award	RKP & ISMAANA	All Department	1	Plaque Certificate and a cash prize
16	Inder Mohan Thapar Research Award (IMTR)	Inder Mohan Thapar Foundation Trust, Karam Chand Thapar Group	a. Mining Engg. b. Petroleum Engg. c. Environmental Science & Engg. d. Fuel & Mineral Engg. e. Applied physics f. Humanities and Social Sciences	6	Citation and a cash prize
17	Nagendra Kumar Memorial Award of Excellence	ISMAA	All Disciplines	NA	Citation and a Plaque

S. No.	Name of the Award/Scholarship	Sponsoring Agency	Discipline	No. of Award	Type of award
18	ISMAA (ISM 1969 Batch) Research Awards	ISM 1969 BATCH	a. Mining Engineering b. Petroleum Engineering	2	Citation and a cash prize
19	Research Publication Award for JRF of Electronics Engineering Department	ECE Department	ECE Department	1	Citation and a cash prize
20	Jagat Chandra Sarkar Memorial Award	Shri Sushanta Sarkar, a distinguished alumnus of 1966 Batch, Petroleum Engineering	Mining Engineering B.Tech/Dual Degree	1	Citation and a cash prize
21	Jagat Chandra Sarkar Memorial Award	Shri Sushanta Sarkar, a distinguished alumnus of 1966 Batch, Petroleum Engineering	Petroleum Engineering	1	Plaque Certificate and a cash prize
22	Bhaskar Bhattacharjee Memorial Distinguished Alumnus Award	ISMAA and IIT (ISM)	Alumni	2	Citation and a Silver Plaque
23	Canara Bank Research Award (Group/Individual)	Canara Bank	All Disciplines	1	Citation and a Medal
24	ISMAA Award for guiding highest no. of PhDs in last three years.	ISMAA	All Disciplines (For Faculties)	1	Citation and a Medal
25	SBI Award for maximum resource generation during a financial year	SBI	All Disciplines	1	Citation and a Medal
26	ISMAA Award for maximum resource generation during a financial year	ISMAA	All Disciplines	1	Citation and a Medal
27	ISMAA Best UG Student Award admitted through IIT-JEE	ISMAA	All Disciplines	1	Citation and a Medal
28	ISMAA Best PG Student Award	ISMAA	All Disciplines	1	Citation and a Medal
29	ISMAA Best Sports Person Award	ISMAA	All Disciplines	1	Citation and a Medal

International Relations & Alumni Affairs (IR&AA)

S. No.	Name of the Award/Scholarship	Sponsoring Agency	Discipline	No. of Award	Type of award
30	SBI non-teaching employees Group Award	SBI	Non-Teaching Employees	1	Cash Prize and a Certificate
31	Prof. S. P Banerjee Medal	Prof. S.P. Banerjee, Adjunct Prof., ESE and former Director-in-charge, IIT (ISM) Dhanbad	ECE Department (for UG Student)	1	Cash Prize and a Certificate
32	ISM 89 Silver Jubilee B. Tech Scholarship	ISM 89 Silver Jubilee Celebration Committee	All Disciplines	4	Cash Prize and a Certificate

6. Philanthropic Activities

Center of Societal Mission (CSM)

In consonance with the ‘Unnat Bharat Abhiyan’ scheme initiated by Shri Narendra Modi, Hon’ble Prime Minister of India, a “Center of Societal Mission (CSM)” has been operational since 2015 at IIT (ISM), Dhanbad as a part of national initiative of Government of India to enable processes that connect institutes of higher education with local communities, to address the development and challenges of rural India through participatory processes and to utilize an appropriate technologies for accelerating sustainable growth.

Mission: "Sustainable and inclusive growth of the villages adopted by IIT(ISM), Dhanbad by increasing opportunities for improvement of quality of life through education and general awareness about Social, Environmental and Health".

Vision: Sustainable and all-encompassing growth through awareness and education.

Objectives of CSM:

- To create an educational, health and environmental awareness among the villagers surrounded by IIT(ISM), Dhanbad.
- To impart basic computer training to the underprivileged children and parents.
- To drive clean and green environment in an around the villages.
- To facilitate convergence of development schemes, resources, various planning and implementation initiatives, and coordination of agencies for successful interventions and measurable outcomes in consonance with the ‘Unnat Bharat Abhiyan’ scheme, launched by the Government of India.
- To promote network and coordination among various science and technology based voluntary organizations and developmental agencies already functional in those areas.
- To develop an academic framework for working on societal problems, their solutions, delivery, reporting and assessment.
- To assist the underprivileged children for bringing them into mainstream education.
- To organize workshops, seminars and symposiums for the development of the people.

Flag-bearers of Center for Societal Mission (CSM)

Kartavya: provides education, nutritious diet and medical help to poor children and tribal community. The UG students with help from faculty, officers, alumni and other wellwishers are running centres namely Lahabani, Koranga Basti, Mandal Basti, Barmasia and Dhaiya School etc. under different chapters of Kartavya. The 10th annual day of Kartavya was celebrated on January 12, 2020. About 600 students from around 25 schools, with 61 teams for Poster Presentation and 23 teams for Science Exhibition participated the this event.

Philanthropic Activities

Karmajyoti: This societal group of IIT (ISM) Research Scholars runs six educational centres for poor children of under-privileged communities, in and around IIT (ISM), Dhanbad. Karmajyoti organizes daily free Yoga classes as a part of our healthcare project at Students Activity Center (SAC).

Fast Forward India: This group is involved in providing healthcare facilities to nearby areas of IIT(ISM), Dhanbad and organizes blood donation camps regularly. This mission has achieved the distinction of donating the highest quantum of blood in Jharkhand State, which has also recognised at national level by the Government of India. UMEED, the annual festival of Fast Forward India was held on January 19, 2020. It witnessed a record- breaking participation of over 1000+ students from 43 schools and 6 NGOs.

Awards and Achievements

- Award for most number of blood donations (540+) to PMCH under a felicitation program organised by Jharkhand Aids Control Society at Patliputra Medical College and Hospital (PMCH).
- Karma-Jyoti and Fast Forward India, under Center for Societal Mission (CSM) of Indian Institute of Technology (ISM), Dhanbad were awarded with 'Yuva-Gaurav-Samman' by 'Jharia Coalfield Samiti', Dhanbad on 12-January-2020 to mark Birth Anniversary of Swami Vivekananda.
- 04 Blood Donation Camps were organized on June 23, 2019- 35 units, August 25, 2019- 250 units, November 30, 2019-175 units, January 26, 2020- 169 units. 629 Precious units of Blood were collected. Throughout the year 370 blood requirement cases were handled.

Awareness Programmes

Menstrual Hygiene Awareness Workshop for School Girls and Women:

- May 28, 2019: Middle School, Dhanbad
- July 29, 2019: Carmel School, Dhanbad
- October 19, 2019: School-Al- Islah Wassepur, Odiya Basti (BCCL Colony), Lahbani centre of Fast Forward India.
- January 22, 2020: M. E. School Hirapur
- February 5, 2020: BSS Girls Middle School and High School

Single Use Plastic Free Campus and Market

- October 2, 2019: IIT (ISM) Dhanbad campus
- February 29, 2020: Local Subzi Market of Dhanbad

Swachchhata Awareness

- May 06, 2019: Clean Campus Campaign
- January 16-31, 2020; Swachhata Pakhwada
- Nasha Mukti rally on October 02, 2019

Education Programmes Organized

- **IIT-JEE Free coaching classes** were conducted 06 days a week, 04 Hrs/day from 01.05.2019 to 15.01.2020 by the volunteers of Karma-Jyoti (CSM). Out of fourteen students, one student qualified in IIT-JEE Mains 2020.
- **Career counseling program DISHA by FFI** was conducted in different schools in and around Dhanbad (such as: St. Antony High School, Kids garden school, Abhay Sundari High School and Koyalanchal public school, etc.) in every weekends from July – October 2019.
- Free coaching for preparation of **Navodaya Vidyalaya Entrance Test** conducted from August-December 2019 by the volunteers of FFI for the students of class 5th of different schools of Dhanbad.
- **English Speaking Course (ESCAPE)** is being conducted regularly by Fast Forward India for the underprivileged children in the villages adopted by IIT (ISM), Dhanbad.
- A **Computer Learning programme (JAGRITI)** is functioning since 2008 by Fast Forward India to impart basic computer education free of cost to the underprivileged children in and around Dhanbad.

7. Annual Fests, Sports & Events

5th International Day of Yoga

The International Day of Yoga was jointly organised with Dhanbad District Administration on June 21, 2019 in presence of Prof. Rajiv Shekhar, Hon'ble Director, IIT(ISM), Sri Anjaneyulu Dodde, DC Dhanbad, Sri Phul Chand Mandal, MLA Sindri, Prof. J. K. Pattanayak, Deputy Director, IIT(ISM) and many other distinguished faculty members, officers and staff. The programme included e-Essay competition, drawing competition, quiz competition and a mass yoga session where more than 950 hundred participants took part.

Annual Mining Tech-Fest, Khanan 2019

Khanan 2019 Annual Mining Technical Fest of IIT(ISM) Dhanbad. Society for Mining, Metallurgy and Exploration (SME), IIT (ISM), Dhanbad Chapter in association with the Department of Mining Engineering, IIT (ISM), Dhanbad organized KHANAN' 19, during September 05-08, 2019. The Mining Tech-fest provided an excellent opportunity for the young buzzing minds of mining and earth sciences community to compete with the best and the brightest from all over the country and hone their techno-management skills in the area of Mining and other Earth Science disciplines. More than 750 buzzing mining and earth sciences future technocrats across the country participated in the various events such as tech-fest spread over 3-days.

Hindi Fortnight

In sync with the Official Language Policy of the Government of Indian the Institute observed Hindi Fortnight in the form of grand celebration involving Faculties, Officers, Students and Staff of the Institute. The following competitions of Rajbhasha Hindi were organized during 14-September 28, 2019:

- Hindi Poem Recitation Competition (Category: Students)
- Hindi Essay Writing Competition (Category: Students)
- Hindi Debate Competition (Category: Students)
- Hindi Essay Writing Competition (Category: Faculty/Officer; Hindi/Non-Hindi Speaking)
- Instant Speech Contest (Category: Staff; Hindi/Non-Hindi Speaking)
- Hindi Noting and Draft Writing Competition (Category: Staff; Hindi/Non-Hindi Speaking)
- Hindi Typing Competition (Category: Staff)

CONCETTO 2019

CONCETTO-2019, the annual Techno-Management fest of IIT (ISM) Dhanbad was organized from 18-20 October, 2019. CONCETTO-2019 was organised with a theme "To the Moon and Back", Gabe Gabrielle, the former Director of Engineering for the US Air

Annual Fests, Sports & Events

Force's Special Operations Command as well as a former contractor/engineer at NASA's Kennedy Space Center, was the Chief Guest of Conchetto'19. ISRO scientist had given a talk on Chandrayan 2 journey; Dr. Arun Dayal, Robotic expert had delivered a talk on Industrial and Parallel Robotics; Sandeep Jain, CEO and founder of GeeksforGeeks delivered an invited talk. Jharkhand Science and Technology Executives explained the possibilities of young minds in the science and technology domain. Thousands of participants from all across the country come to compete in this largest techno-management fest of India.

91st Annual Sports Meet - 2019

The 91st Annual Sports Day was organized from November 09-10, 2019. During the Sports Meet Nineteen (19) Olympic events were conducted with huge participation of students and staff. Winners (Students and Staff) of all Olympic events were awarded in the closing ceremony.

- Best Athlete Men (Students) - Bhukya Madhu, Bellatrix House.
- Best Athlete Women (Students) - T. Veena, Sirius House.
- Best Team Men (Students) - B.Tech 3rd year with 61 points.
- Best Team Women (Students) - B.Tech 2nd year with 41 points.
- Best Athlete Men (Staff) - Prof. Abhishek Kumar Singh, Mathematics & Computing.

94th Foundation Day 2019

IIT (ISM), Dhanbad celebrated its 94th Foundation Day on December 09, 2019. Shri Shailesh Kumar Singh, IAS, Principal Secretary, Department of Higher, Technical Education and Skill Development, Govt. of Jharkhand had delivered 94th Foundation Day Lecture on "Ninety Fourth Foundation Day of IIT (ISM): Celebrating more than nine decades of Academic Excellence". Prof. Rajiv Shekhar presented Road Map of progress of IIT (ISM), Dhanbad. 11 Employees were honoured who completed 25th years of service at IIT (ISM), Dhanbad. The main celebration ended with plantations of different kind of plants. Approximately 500 students from local schools had visited Geological Museums, various laboratories. The students were made acquainted with geological specimens and equipment of various laboratories. In the evening, there was get together of Faculty Members, Officers and Staff Members, workers of all Departments/ Centers with High Tea in Scolomin House.

Inter IIT Sports Meet:

IIT(ISM), Dhanbad contingent comprising of 164 participants along with 15 coaches participated in 54th Inter IIT Sports meet held during December 14-22, 2019 at IIT Kharagpur and IIT Bhubaneswar. Following are the major highlights of the meet:

- IIT(ISM), Dhanbad contingent has also secured 1st position in March-past.
- Mr. Prashant Kaushik, 2nd Year B. Tech (Mechanical Engineering) has won Silver Medal in 69 Kgs category of Weight Lifting.
- Mr. Seth Oppong A., 2nd Year B. Tech (Petroleum Engineering) has won Silver Medal in Discuss Throw.
- Football team of student has won Bronze medal.

- Mr. Manoj Kumar, 2nd Year B. Tech (CSE) has won Bronze Medal in 77 Kgs category of Weight Lifting.
- Mr. V. Prasad Naik, 4th Year B. Tech (CSE) secured 4th position in Javelin throw.

Inter IIT Cultural Meet:

IIT (ISM) students participated in the different events in the ‘Inter IIT Cultural Meet 2019’ hosted by IIT Bombay on December 20-22, 2019. Based on the sum of points gained in total 36 events, IIT (ISM) secured 9th position among the 23 IITs.

Following are the major highlights of the meet:

S. No.	Name of the event	Theme of the event	Position secured
1	PHOTOGRAPHY	theme Photostory	2 nd
		theme Photography	3 rd
2	DANCE	Street battle	2 nd
		Do-it	6 th
3	DRAMATICS	Street play	3 rd
		Stage play	5 th
4	MISCELLANEOUS	Fashion show	4 th
		DJ Battle	4 th
5	FILMMAKING	online filmmaking-	3 rd
		51 hours filmmaking	6 th
6	QUIZ	Sports Quiz	5 th
7	LITERARY	Slam poetry - 5	5 th
		Creative writing - 5	5 th

Ek Bharat Shreshtha Bharat

The program was initiated by Hon'ble Prime Minister and was announced on October 31, 2015 on the occasion of the 140th birth anniversary of Sardar Vallabhbhai Patel. The aims of this programs is to enhance the interaction between people of diverse cultures living in different States and UTs in India and the objective is to promote greater mutual understanding amongst them. A student chapter EBSB has been formed under this banner. The calendar for Ek Bharat Shreshth Bharat is being prepared and it is going to ascertain that the events happen monthly.

EBSB organized two events in the month of December and January featuring five states of India. The details of the events are as follows:

- West Bengal and Rajasthan team gave beautiful performances depicting the richness of culture of both states on January 03, 2020.
- Andhra Pradesh, Telangana and Haryana team performed in Penman Auditorium depicting the richness of culture of these states on January 27, 2020.

Annual Fests, Sports & Events

Srijan 2020

Srijan-2020 was organised from January 31, 2020 to February 2, 2020. This fest offered a platform to explore a wide variety of talents among the students in the various field of art, drama, music, literary debates and entrepreneur innovation apart from academics. A plethora of celebrity performances such as DJ Night starring BassHunk, Zenith and Shabbir; Band night starring Anand Bhaskar Collective; Star Night - Darshan Rawal took place during this fest. Prof. Rajni Singh (Convener), Prof. Sowmiya Chawla (Co-Convener) & Prof. Raghvendra Kumar Chaudhary (Co-Convener) and Prof. Suresh Kumar Yatirajula (Treasurer) were instrumental in organizing Srijan-2020.

Industry-Institute Interaction (III) 2020

Industry-Institute Interaction (III)-2020 was held on February 01, 2020. The theme of the III-2020 was “Technology 2050 – The March Towards Innovation”. The Chief Guest of the event was Shri Naresh Vashisht, President, Omimex Resources Inc. and the Guest of Honour was Dr. G. C. Thakur, Distinguished Professor, Deptt. of Petroleum Engg., University of Houston. Hundreds of industrialists, executives, academicians, students, and alumni attended and shared their views on a common platform. Prof. Keka Ojha, Prof. Ajit Kumar, Prof. Gauri Shankar and Prof. Patitapaban Sahu were Convener, Co-convener, Treasurer and Joint Treasurer respectively for III-2020.

Basant 2020

Basant-2020: Annual Alumni event of IIT(ISM) was held on February 02, 2020. 1960 Batch and 1970 Batch celebrated their Golden Jubilee and Diamond Jubilee respectively. General Body meeting of Alumni Association, IIT (ISM) was held during the event. Distinguished Alumnus Awards were conferred to the distinguished alumni who achieved milestones in their respective fields. Prof. Keka Ojha, Prof. Saurabh Datta Gupta, Prof. Gauri Shankar and Prof. Patitapaban Sahu were Convener, Co-convener, Treasurer and Joint Treasurer respectively for Basant-2020.

Matribhasha Diwas

The Hindi Cell of the Institute organized Matribhash Diwas on February 24, 2020, integrating a gamut of Competitions like Poem Recitation, On-spot Elocution and Essay Writing competitions.

International Women’s Day 2020

IIT-ISM Dhanbad dedicated first week of March for the celebration of Women’s Day with theme #eachforequal. On the occasion, several events were organized from March 02-04, 2020. It was not limited to certain group of the Institute; every event was open for the participation of each and every employee and their dependents. Prof. Rajni Singh, Prof Saumya Singh, Prof Nirupama Mandal and Ms. Sukhninder Kaur conducted the various events in the Women’s Day.

Team Participation in Extramural Competitions:

- Mr. Ravi Ranjan Kumar (18JE0673) won bronze medal in 84kg weight category of kumite event. in Jharkhand Sub Junior and Senior Karate Championship 2019 held at Tana Bhagat Indoor Stadium, Ranchi during May 25-26, 2019
- IIT(ISM) Boxing Team participated in Students Olympic Youth Games 2019 organized by Students Olympic Association, India from June 08-10, 2019 at Lovely Professional University, Punjab. Mr. Shivam Tyagi, (16JE002684) and Mr. Tejram, (17JE003342) bagged Gold and Silver medals respectively.
- Power Lifting team comprising of 2 students (boys) participated the 1st All India Power Lifting Championship Men & Women - Affiliated by UIPSL Power Lifting India/International held at Gurgaon, Haryana during July 20-21, 2019.
- The 34th Dhanbad District Athletic Meet was conducted during August 18-19, 2019 in the premises of IIT (ISM) Dhanbad. The Athletics Team of IIT(ISM) Dhanbad participated in the event and bagged 4 medals in different categories.
- The Boxing team participated in the 35th Edition of SPARDHA, an all India Sports Festival of IIT BHU. Among the participants, Mr. Shivam Tyagi (69 kg), Mr. Vijay Mishra (91 kg), Mr. Parveen (52 kg), Mr. Mahamkali (56 kg), Mr. Avinash (75 kg), Mr. Anshuman (91+ kg) and Mr. Gaurav (60 kg) received prizes. The Squash team, also participated in this event and bagged prizes.
- Koylanchal Open Classical Bodybuilding Championship 2019 was organized by the Bodybuilders Association of Jharkhand on November 10, 2019. Our two students, Mr. Sandeep, B.Tech, (Mining Engineering) received the Bronze Medal (Mr Koylanchal) in 70 kg Category and Ms. Jaladi Vinuthna Vinod Raju (MBA, Management Studies) got the Gold Medal (Miss Koylanchal) in Open Category women's physique.
- Inter hostel General Championship 2019-20 was organized on weekends in the said duration for games like Football, Volleyball (Men & Women), Basketball (Men & Women), Tennis, Table Tennis (Men & Women), Chess (Men & Women), Squash (Men & Women), Cricket, Hockey, Gym, Boxing/Wushu, Karate (Men & Women).
- IIT (ISM), Dhanbad Staff team comprising of 52 participants in the games of Cricket, Athletics (Men & Women), Badminton, Football, Volleyball participated in 26th Inter IIT Staffs Sports meet held during December 24-28, 2019 at IIT Kharagpur.
- Ms. Jaladi Vinuthna Vinod Raju secured Gold medal and title winner “Miss Bharath Physique 2019” in Open Category of women's physique/Fitness in 67th National Fitness and Bodybuilding Championship 2019 organized by Indian Fitness and Bodybuilders Federation held at Bangalore on December 28-29, 2019.
- Karate team comprising of 11 students (Men) participated in the 6th All India Bushikan Shoto Karate Championship held in Dhanbad on January 11-12, 2020 and brought laurels for the institution by winning the following medals.

Annual Fests, Sports & Events

Name	Department	Event	Medal
Mr. Rupak Devraj	Petroleum Engineering	Kumite	Gold
Mr. Shulabh Prakash	Integrated Masters of TAG	Kumite	Gold
Mr. Nikhil Parashar	Petroleum Engineering	Kata	Silver
Mr. Govind Mahato	Mathematics & Computing	Kumite	Silver
Mr. Ravi Ranjan Kumar	Electrical Engineering	Kumite	Silver
Mr. Debojit Panging	Petroleum Engineering	Kumite	Silver
Mr. Zacharia Nhial	Petroleum Engineering	Kumite	Bronze
Mr. Vivek Singh	Environmental Science & Engineering	Kata	Bronze
Mr. Saurav Mandal	Mining Machinery Engineering.	Kumite	Bronze
Mr. Priyadarshree P. Dash	Physics	Kumite	Bronze

- Boxing team comprising of 09 students (Men) participated in 62nd Senior Men National Boxing Championship 2019-20 held at Motilal Nehru Stadium, Rae Bareilly, U.P. from January, 05-09, 2020 in which our 3 students reached up to the quarter final.

8. Facilities at IIT (ISM), Dhanbad

Central Library

The Central Library of the Indian Institute of Technology (ISM) provides academic and research support to all the departments and centres of the institute. Concerned with the needs of library users, the library tried to provide a silent conducive environment for study. Equipped with Wi-Fi internet connections the library served its users for reference



services, semester exam preparations, project writing and research etc. The Central Library is centralized air-conditioned and operating on four floors of the new library building. Floor-wise functional sections and activities of the Central Library are as follows,

FIRST FLOOR		SECOND FLOOR	
❖ Member Registration Section		✚ Book Acquisition Section	
❖ Circulation Section		✚ Technical Processing Section	
❖ Reference Desk		✚ Anti-plagiarism Cell	
❖ Library Office		✚ IRINS Research Showcase Section	
❖ Conference Room		✚ Book Stacks Area	
❖ Newspaper Section		✚ Reading Area	
❖ Theses, Dissertations, Reports & Newsletter Section		✚ Library Automation & Database Maintenance Section	
❖ Back volumes Journals Archive section		✚ Departmental Library & Project Cell	
❖ Binding section		THIRD FLOOR	
❖ Institutional Digital Repository		➤ E-Resource and Journal Section	
❖ Research Documentation Cell		➤ Scientific Magazine Display section	
❖ Digital Library Section		➤ Book Stacks Area	
❖ Network Control Room		➤ Reading Area	
❖ CCTV Control Room		➤ E-Resource and Journal Section	
FOURTH FLOOR			
• Student Reference Books Section		▪ Open Reading Hall facility	

During the academic year 2019-20, the library served about 1000 users a day and was open for seven days a week. The Open Reading Hall (ORH) was open from 9 am through 12 midnight.

Facilities at IIT (ISM), Dhanbad

The Central Library is automated in terms of records management, information retrieval and service delivery. Over the years the library has developed several databases. It has about 1,38,196 accessioned books, about 40,500 bound volumes of journals, 12,000 theses and dissertations, and about 39 magazines, and 16 newspapers for the period. During this period 1328 books were added to the library holding. The library also possesses e-Books, on perpetual access basis, from Springer E-Books Subject Collections (Copy right years: 2005–2017), Taylor & Francis e-books (about 401 titles) and McGraw-Hill Express Library (about 398 titles) in the fields of Basic Science & Technology, Materials Science, Computer Science, Earth & Environment Sciences, Business and Management, Chemistry, Mathematics, Statistics, Physics, Astronomy and Engineering.

Within the library, all records of library collection are accessible online through Online Public Access Catalogue (OPAC) through touch-screen kiosks connected to the library's Local Area Network (LAN) as well as Web OPAC link available on the library's website. 'Search', 'Browse', New Additions, My Account and many more enquiry facilities in the OPAC module of Libsys Library Management Software enabled the users to find out records on their own, thereby saving their time. The library maintained the electronic databases of its printed sources – lending books, SRB & reference books, journal loose issues as well as bound volumes, theses, dissertations, conference proceedings, standards and journal articles. The library has its official website that facilitates information search from the library's bibliographic and book transactions records of the library users of the Central Library through web-based online public access catalogue (WebOPAC) on campus-wide LAN. The library website (<http://www.iitismlib.ac.in>) is well organized, informative and user friendly.

All processes at Book Acquisition Section – ordering, bill processing, etc. were done through LibSys Integrated Library Management Software (ILMS). At Technical Processing Section books, dissertations, PhD theses, etc. were labelled with system-generated barcodes, spine slips and book cards. The library continued to paste bar-code labels on new and old documents. The Central Library ensured error-free barcode-based circulation system, quick posting of library dues and fast settlement of no-dues to out-going students and superannuated employees.

All documentation jobs including data entry of bound volumes journal at the Journal Section proceeded through LibSys ILMS. The section rendered reference services out of old print journals and online e-journals. The library provided online access to thousands of e-journals with full-text articles to the faculty members, research scholars and students.

The following e-resources were made available to the library patrons during 2019-20,

SUBSCRIBED E-RESOURCES OF THE CENTRAL LIBRARY	
❖ American Chemical Society e-journals and legacy archive	❖ AIP Journals e-SS collection
❖ Geo-Science World & GeoRef	❖ IS-CED Online (Civil Engineering)
❖ Turnitin Anti-plagiarism web tool	❖ India State-Mining statistical data
❖ ProQuest Dissertations & Theses Global	❖ Sage Business Cases- Complete collection

SUBSCRIBED E-RESOURCES OF THE CENTRAL LIBRARY	
❖ SciFinder Scholar	❖ MathSciNet
❖ Science Direct Freedom Collection,	❖ One Petro
❖ IEEE IEL Online	❖ Springer e-journals
❖ Emerald eSS e-journals	❖ CSD Enterprise Researcher-Group
❖ Nature Journal	❖ Scopus
❖ ASTM Standards & Digital Library	❖ Science Direct 7 Backfiles

The Central Library got the following e-resources through e-Shodh Sindhu Consortium of MHRD, GOI,

E-RESOURCES ACCESSED THROUGH ESS CONSORTIUM OF MHRD	
✚ ACM Digital Library	✚ ISID Database
✚ American Physical Society (APS) All	✚ J-Gate Plus (Federated search engine)
✚ ASCE Journals	✚ JSTOR
✚ ASME Journals	✚ Web of Science

Besides, the library provides access to two more National Digital Library of India sponsored e-resources,

E-RESOURCES ACCESSIBLE THROUGH NDLI	
➤ World e-Book Library	➤ South Asia Archive

The Central Library also provided remote access to e-resources through institutional VPN, a service to provide access to the IIT (ISM) campus. The links of all the e-resources have been provided through the library's official website.

Access to IRINS database of INFLIBNET was provided through the Central Library official website. For the benefit of young researchers –the Central Library organized the 'Wiley author workshop' to educate the technicalities of scientific paper writing to its patrons.

Computer Centre

Institute is marching ahead to build its State of the art Central Computing and Data Centre Infrastructure to meet its upcoming computing and networking requirements as per the evolving standards of IIT. The main goals are to:

- Building an ideal IT learning hub for all to start and enhance their IT skills at all levels so as to promote "Skill India" and "Make in India" programme of Government of India.
- Develop an efficient cross platform environment for hosting and promoting different research and technological incubations for high performance computing and data analytics.

Facilities at IIT (ISM), Dhanbad

- Develop a scalable system for managing access control and auditing for “Write Once Access Anywhere” in era of distributed computing.
- Creating ‘Smart Class’ and ‘Video Conferencing’ facility for the Institute.
- Campus wide Wi-Fi with proper user authentication and network admission control was established so as to create secure Wi-Fi zone for all valid users of IIT (ISM) fraternity.

The services provided by the Centre includes:

- Installation & Maintenance of Servers for : Internet access, E-mail facilities, Samba sharing facility, Appliance based authentication access, Computation facilities, VPN facilities for accessing Journals and E-contents from outside the Institute.
- Management and upkeep of the Official IIT (ISM) Dhanbad website; Institute wide Wi –Fi enabled environment; the Centralized Computer Lab accessible to all the students of the institute as well as all researcher / project students.
- Maintaining 1Gbps Internet Leased Line (ILL) from NKN and 2 nos. of 800 Mbps ILL from RailTel and Vodafone for seamlessly connected about 9000 nodes.
- Providing technical assistance to the Academic and Administrative Staff of the Institute.
- Providing facilities to the Students who come from various academic institutes for their short-term courses, mini project work and summer training etc.
- Providing video conferencing facility for conducting PhD Viva Voce, lectures, seminars etc.
- Provides and maintains different machines having Windows, Linux and Mac Operating Systems of the Faculty & Staff members.
- Providing ITES facility for conducting various campus interviews for placement of the students as per the guidance of Training and Placement Cell.
- Hosting MIS, E-Office and Moodle in local DATA centre
- High-Performance Computing (HPC) Cluster and NVIDIA DGX-1 under deployment

These facilities are constantly being upgraded to meet the evolving requirements of different departments. Many departments are using the facilities of the Computer Labs to conduct their practical classes & examinations. The campus LAN is now extended to all the hostels, health centre and residences. The Faculty and Officers are also using the facility of IPDSLAM for residence Internet. New hardware and software are being procured on a regular basis so as to provide a state of the art computing facility to the IIT (ISM) Dhanbad family.

Central Workshop

The workshop of the Institute has a wide range of manufacturing facilities catering to the needs of undergraduate and postgraduate students as well as research scholars. It provides good facilities for Forging, Carpentry, Fitting and Sheet Metal working. It also provides excellent facilities for Welding, Casting and Machining, Induction melting furnace, Gear hobbing and Gear shaping machines, Surface Planer machine, Tool & Cutter grinding machine, Band Saw (Wood cutting machine), TIG, MIG, SAW welding machines, Template based gas cutting machine, CNC Profile cutting machine, and Power Press machine are

important facilities. There are CNC programming laboratory and sophisticated Computer Aided Manufacturing (CAM) laboratory consisting of latest CAM Software, CNC turning (trainer), and CNC milling (trainer) machines. There is Flexible Manufacturing System facility, CNC Lathe machine fitted with Automatic Guided Vehicle and Automatic Storage and Retrieval System (ASRS). There is Rapid prototyping machine (3-D Printer). There is also a Dimensional Metrology laboratory in which variety of linear, angular, surface flatness (Auto Collimator)/ surface roughness (Surface Roughness Tester) measuring instruments, gear tooth thickness (Gear Tooth Vernier Calipers) /circular pitch (Flange Micrometer) measuring instruments, variable Microscope and Metallurgical microscope are important measuring instruments. There is Die Sinking EDM for nontraditional machining. There is a high precision 400 Watt Fibre Laser welding machine in Laser machining laboratory. HMT high precision Sliding Surface & Screw Cutting lathe with Piezoelectric 3 Dimensional Force Sensor, Polishing Machine and Hot Mounting Press as well as Compact RIO Controller hardware are in full operation. Abrasive Cut-off machine is under installation and commissioning. All these laboratories/facilities are housed in the new workshop building. There are Wire-EDM and Electrochemical Machine (ECM) for nontraditional/advanced machining in Nontraditional machining laboratory.

Many students fabricate various equipments for example vehicles, robots, air tunnels, etc. for national level competitions. Short-term training courses related to manufacturing process/workshop technology for engineers/ officers/ executives have been conducted. Various types of furniture, fixtures and components of machines and equipment of different departments of the Institute are also repaired and manufactured in the workshop on demand.

Health Centre

The Health Centre of the Institute has been catering the medical needs of around 8300 students, 252 permanent staff members and 300+ faculty members along with their dependents. Besides this, most of the retired employees with their spouses have also been provided medical treatment through the Health Centre. Two permanent doctors, one part-time doctor and four doctors on contract have been providing routine OPD as well as emergency services round the clock.

Following services are provided by IIT(ISM) Health Centre

- ✚ Outdoor services
- ✚ Indoor services
- ✚ Isolation ward facility
- ✚ Pathological tests
- ✚ Dental services
- ✚ Physiotherapy unit
- ✚ Homoeopath clinic
- ✚ X-Ray facility
- ✚ Specialist medical consultancy services
- ✚ 24 x 7 emergency services with ambulance
- ✚ Immunization – 4th Thursday of every month
- ✚ Services at empaneled hospitals (inside and outside Dhanbad) are also available.

**LIST OF HOSPITALS IN INDIA ARE AVAILABLE FOR TREATMENT
IIT(ISM) DHANBAD EMPLOYEES**

Sl. No.	Name of Hospital	Facility available
1.	All Govt. Hospitals in India (PSU Hospitals/Railway Hospitals).	No Credit Facility (General Treatment for all disease)
2.	Peerless Hospital & B.K. Roy Research Centre 360, Panchasayar, Kolkata – 700 094, WB	Credit Facility CGHS rate (General Treatment for all disease)
3.	Disha Eye Hospitals & Research Centre Pvt. Ltd. 88(63A), Ghoshpara Road, Barrackpore, Kolkata – 700 120, WB	No Credit Facility (Only for Eye Treatment, as per Govt./CGHS rate).
4.	Rabindranath Tagore International Institute of Cardiac Sciences 124, Mukundapur, EM Bypass, Near Santoshpur Connector, Kolkata – 700 099, WB	Credit Facility CGHS rate (General Treatment for all disease)
5.	Ruby General Hospital Ltd. Kasba Golpark, EM Bypass, Kolkata – 700 107, WB	Credit Facility CGHS rate (General Treatment for all disease)
6.	Christian Medical College & Hospital Ida Scudder Road, Post Box No.3, Vellore – 632 004, Tamilnadu.	Credit Facility As per rate of CMCH (General Treatment for all disease)
7.	Sankara Nethralaya Unit of Medical Research Foundation Old No.18, New No.41, College Road, Chennai – 600006, Tamilnadu.	No Credit Facility (Only for Eye Treatment, as per Govt./CGHS rate).
8.	Narayana Hrudayalaya Hospital & Health City No.258/A, Bommasandra Industrial Area. Anekal Taluk, Bangalore – 560 099, Karnataka.	Credit Facility CGHS rate (General Treatment for all disease)
9.	Ruby Hall Clinic 40, Sassoon Road, Maharashtra, Pune – 411 001, Maharashtra.	No Credit Facility (General Treatment, as per Govt./CGHS Rate).
10.	Sanjay Gandhi Post Graduate Institute of Medical Sciences Raibareli Road, Lucknow 226014, UP.	No Credit Facility (General Treatment)
11.	Post Graduate Institute of Medical Education & Research	No Credit Facility (General Treatment for all disease)

Sl. No.	Name of Hospital	Facility available
	Chandigarh.	
12.	The Mission Hospital Plot No.219 (P), Emmon Kalyan Sarani, Sector – 2C, Bidhannagar, Durgapur – 713 212, WB.	Credit Facility CGHS rate (General Treatment for all disease)
13.	IQ City Narayana Multi-Specialty Hospital Durgapur, WB.	Credit Facility CGHS rate
14.	Delhi Heart & Lung Institute 3-MMH Panchkujan Road, New Delhi – 110055.	Credit Facility CGHS Rate (Only for Heart & Lung diseases)
15.	New Delhi Centre for Sight Pvt. Ltd. 1. B-5/24, Safdarjung Enclave New Delhi – 110 029. 2. A-23, Green Park Aurobindo Marg, New Delhi – 110 016.	No Credit Facility (Only for Eye Treatment, as per Govt./CGHS rate).
16.	All India Institute of Medical Sciences (AIIMS) New Delhi.	No Credit Facility (General Treatment for all disease)
17.	PSRI Press Enclave Marg, Sheikh Sarai –II New Delhi -110017	Credit Facility (General Treatment for all disease at CGHS rate)
18.	Sir Ganga Ram Hospital Sir ganga Ram Marg, Rajinder Nagar, New Delhi – 110 060.	No Credit Facility (General Treatment for all disease)
19.	Sukhmani Hospital B-7 Extn./126A, Safdarjung Enclave, New Delhi – 110 029.	No Credit Facility (General Treatment for all disease)
20.	Tata Memorial Hospital DR.E. Borges Marg, Parel, Mumbai – 400012.	No Credit Facility (Only for Cancer disease)
21.	Nizam Institute of Medical Sciences Panjagutta, Hyderabad.	No Credit Facility (General Treatment for all disease)
22.	Bokaro General Hospital (BGH) Bokaro, Jharkhand.	No Credit Facility (General Treatment for all disease)
23.	Asarfi Hospital Pvt. Ltd. Baramudi, P.O. – Bishunpur Polytechnic, Dhanbad – 828130, Jharkhand.	Indoor Credit Facility (Only for Obst./Gynac. Treatment). In Emergency – General Treatment for all disease.
24.	Pragati Medical & Research Centre, Nursing Home, Main Road, Saraidhela,	Indoor Credit Facility (Dental Treatment). In Emergency – General Treatment for

Facilities at IIT (ISM), Dhanbad

Sl. No.	Name of Hospital	Facility available
	Dhanbad – 828127, Jharkhand.	all disease.
25.	Dr. Jyotirbhushan Institute of Medical Sciences (Unit of Dr. Jyotirbhushan Healthcare & Research Pvt. Ltd.), Karmik Nagar, Saraidhela, P.O. ISM, Dhanbad, Jharkhand.	Indoor Credit Facility (Only for Ortho. Treatment).
26.	Asian Dwarkadas Jalan Memorial Hospital (Managed by : JEEVAN REKHA TRUST) Bartand, Dhanbad– 826001, Jharkhand.	OPD & Indoor Credit Facility (General Treatment for all disease, as per CGHS Rate)
27.	Central Hospital, BCCL Dhanbad, Jharkhand.	Indoor Credit Facility (General Treatment for all disease)
28.	P.M.C.H. Dhanbad, Jharkhand.	General Treatment for all disease
29.	Patliputra Nursing Home Joraphatak Road, Dhanbad-826001, Jharkhand.	Indoor Credit Facility (General Treatment for all disease)
30.	Park Clinic Park Market, Hirapur, Dhanbad, Jharkhand.	OPD & Indoor Credit Facility (General Treatment for all disease)
31.	Geeta Shree Eye Clinic Dhanbad, Jharkhand.	Indoor Credit Facility (Eye Treatment only)
32.	Shrestha Eye clinic Saraidhela, Dhanbad, Jharkhand.	OPD & Indoor Credit Facility (Eye Treatment only)
33.	Prudence Eye Clinic Housing colony, Dhanbad, Jharkhand.	No Credit Facility (Eye Treatment only)
34.	ASG Eye Hospital Bank More, Dhanbad, Jharkhand.	Indoor Credit Facility (Eye Treatment only)
35.	Neo Dental Clinic Park Market, Hirapur, Dhanbad, Jharkhand.	OPD Credit Facility (Dental Treatment only)
36.	32 Pearls Dental Clinic, Bartand, Dhanbad, Jharkhand.	OPD Credit Facility (Dental Treatment only)
37.	Om Dental Clinic City Centre, Dhanbad, Jharkhand.	No Credit Facility (Dental Treatment only)
38.	Alam Hospitals & Research Centre Pvt. Ltd., Booty Road, Bariatu, Ranchi – 834 009, Jharkhand.	No Credit Facility (General Treatment for all disease)
39.	Medanta Hospital Ranchi, Jharkhand.	Credit Facility (General Treatment for all disease)

Sl. No.	Name of Hospital	Facility available
40.	Rajendra Institute of Medical Science (RIMS) Ranchi, Jharkhand.	No Credit Facility (General Treatment for all disease)
41.	Bhagwan Mahavir Medica Hospital Ranchi, Jharkhand.	Credit Facility CGHS Rate (General Treatment for all disease)
42.	Indira Gandhi Institute of Medical Sciences Patna, Bihar.	No Credit Facility (General Treatment for all disease)

Student Counseling Centre

The SCC provides psychological support and counseling to all students of IIT(ISM) Dhanbad, assesses and evaluates individual 's problems through the use of interaction, case study, case history, observation, and psychometric assessments as required for establishing and conducting psychological fitness of students, provides individual counseling to enable them to overcome psychological difficulties, in making decisions, and promote personal developments in line with professional development with care. This centre involves working with multidisciplinary team of health care practitioners catering to the psychological and emotional well-being of multicultural adult population.

Honorary Counselor: Mrs. Vidhu Shekhar

Visiting Counselor: Prof. Meena Srivastava

Counselor: Mrs. Anusua Nath

Online Counseling Platform YOUR DOST for students of IIT(ISM) Dhanbad

Emotional wellness and counseling are a crying need in India especially among the young mind who are buffeted by enormous social-cultural-economic pressures. Your DOST is an online emotional platform that leverages technology to provide convenient, anonymous and confidential support to those in need which is in operation at IIT(ISM) Dhanbad since January 13, 2020.

Advantages :-

- Access to 24 x7 x 365 unlimited one to one chat-based counseling for instant help.
- Unlimited Audio/Video Sessions for users.
- Face to face counseling at campus (if required).
- 24x7 telephonic helpline support (On Demand).
- Sessions (Seminar/webinar/workshop) to create awareness on important issues related to Academics, Career, Relationships, De-addiction and Personality Development.

Hindi Cell

The official language policy of the union government of India is implemented in the institute by Hindi Cell. The major works executed under the banner of Hindi Cell are:

- Implementation of Official Language Policy, and compliance of provisions of Official Language, Act 1963 and Rule 1976 in the Institute.
- Organisation of quarterly meeting of Official language committee to discuss various aspects of implementation so that target prescribed in annual programme can be achieved.
- Hindi workshop for the staff who have working knowledge of Hindi to inculcate interests among the staff and remove their hesitation regarding working in Hindi.
- Timely submission of online quarterly/annual report to Rajbhasha Vibhag and MHRD.
- Participation in TOLIC meeting and its activity being organized under the aegis of BCCL, Dhanbad.
- Translation work of Annual Report and all other circulars, orders and official correspondences as and when required.
- Organization of Hindi Fortnight in the month of September every year in the form of grand celebration involving Faculties, Officers, Students and Staff of the Institute.

9. Personnel

List of Faculty Members as on 31/03/2020:

Department of Applied Geology

S. No.	Name
Professor	
1	Prof. Sarada Prasad Mohanty
2	Prof. B. C. Sarkar
3	Prof. Atul Kr. Varma
4	Prof. A. S. Venkatesh
Associate Professor	
5	Prof. Rajendra Kumar Dubey
6	Prof. Mrinal Kanti Mukherjee
7	Prof. Tajdarul Hassan Syed
8	Prof. Shushanta Sarangi
9	Prof. Anup Krishna Prasad
10	Prof. Ajoy Kumar Bhaumik
11	Prof. Sahendra Singh
Assistant Professor	
12	Prof. Pranab Das
13	Prof. Prabodha Ranjan Sahoo
14	Prof. R. Anand
15	Prof. Kripamoy Sarkar
16	Prof. Upama Dutta
17	Prof. Alik Sundar Majumdar
18	Prof. Deepankar Asthana

Department of Applied Geophysics

S. No.	Name
Professor	
1	Prof. Priya Ranjan Mohanty
2	Prof. Shalivahan
3	Prof. Rima Chatterjee
4	Prof. Prosanta Kumar Khan
Associate Professor	
5	Prof. Upendra K. Singh
6	Prof. Sanjit Kumar Pal
Assistant Professor	
7	Prof. Saurabh Datta Gupta
8	Prof. Saumen Maiti
9	Prof. Srinivasa Rao Gangumalla
10	Prof. Mohit Agrawal
11	Prof. Swarandeep Sahoo
12	Prof. Piyush Sarkar

Department of Chemical Engineering

S. No.	Name
Professor	
1	Prof. Vinod Kumar Saxena
2	Prof. Vineet Kumar
Associate Professor	
3	Prof. A. K. Samanta
Assistant Professor	
4	Prof. Suman Dutta
5	Prof. Krishna Sandilya Durbha
6	Prof. Soubhik Kumar Bhaumik
7	Prof. Suresh Kumar Yatirajula
8	Prof. Lutukurthi D. N. V. V. Konda
9	Prof. Paidinaidu Paluri
10	Prof. Siddhartha Sengupta
11	Prof. Aditya Kumar
12	Prof. Ashish Yadav
13	Prof. Ejaz Ahmad
14	Prof. Vivek Shankar Pinnamaraju
Visiting Assistant Professor	
15	Prof. Vikky Anand
16	Prof. Prashant Kumar Gupta
Adjunct Professor	
17	Prof. Indra Mani Mishra

Department of Chemistry

S. No.	Name
Professor	
1	Prof. Udayabhanu G.
2	Prof. Devendra Deo Pathak
3	Prof. Biswajit Chowdhury
Associate Professor	
4	Prof. Mahendra Yadav
5	Prof. Rohith P. John
6	Prof. Sagar Pal
7	Prof. Parthasarathi Das
8	Prof. Hari Pada Nayek
9	Prof. Ganesh Chandra Nayak
Assistant Professor	
10	Prof. Swapan Dey
11	Prof. Somnath Yadav
12	Prof. Sumanta Kumar Padhi
13	Prof. Sumanta Kumar Sahu
14	Prof. Rashmi Madhuri

Personnel

Department of Chemistry	
S. No.	Name
15	Prof. Soumitra Maity
16	Prof. Chanchal Halder
17	Prof. Soumit Chatterjee
18	Prof. Niladri Patra

Department of Civil Engineering

S. No.	Name
Professor	
1	Prof. Sekhar Chandra Dutta
2	Prof. Sarat Kumar Das
Associate Professor	
3	Prof. Sarat Kumar Panda
Assistant Professor	
4	Prof. Srinivas Pasupuleti
5	Prof. Lohitkumar Nainegali
6	Prof. Sanket Nayak
7	Prof. Sowmiya Chawla
8	Prof. Tanish Dey
9	Prof. Sukanta Chakraborty
10	Prof. Smruti Sourava Mohapatra
11	Prof. Kironmala Chanda
12	Prof. Rajib Sarkar
13	Prof. Vishwas Nandkishor Khatri
14	Prof. Satadru Das Adhikary
15	Prof. Piyali Sengupta
16	Prof. Renu V.

Department of Computer Science and Engineering

S. No.	Name
Professor	
1	Prof. Gosta Pada Biswas
2	Prof. Prasanta K. Jana
3	Prof. Chiranjeev Kumar
Associate Professor	
4	Prof. Sushanta Mukhopadhyay
5	Prof. Haider Banka
6	Prof. Sachin Tripathi
Assistant Professor	
7	Prof. Hari Om
8	Prof. Soumen Bag
9	Prof. Annavarapu Chandra Sekhara Rao
10	Prof. Tarachand Amgoth
11	Prof. Rajendra Pamula
12	Prof. Dharavath Ramesh
13	Prof. Arup Kumar Pal

14	Prof. Tanusree Kaibartta
S. No.	Name
15	Prof. Ansuman Bhattacharya
Visiting Professor	
16	Prof. Gadadhar Sahoo
Visiting Assistant Professor	
17	Prof. Ranveer Singh
18	Prof. Madhulika Mohanty
Adjunct Professor	
19	Prof. Laxmidhar Behera

Department of Electrical Engineering

S. No.	Name
Professor	
1	Prof. Somnath Pan
2	Prof. Pradip Kumar Sadhu
Associate Professor	
3	Prof. Kalyan Chatterjee
4	Prof. Biplab Bhattacharyya
5	Prof. Nitai Pal
6	Prof. Sanjoy Mandal
7	Prof. Vivekananda Mukherjee
Assistant Professor	
8	Prof. Sukanta Das
9	Prof. Kartick Chandra Jana
10	Prof. Paresh Kumar Nayak
11	Prof. Gauri Shankar
12	Prof. Bhukya Krishna Naick
13	Prof. Devara Vijaya Bhaskar
14	Prof. Arijit Baral
15	Prof. Anirban Ghoshal

Department of Electronics Engineering

S. No.	Name
Professor	
1	Prof. Sajal K. Paul
2	Prof. Vishnu Priye (On Deputation)
3	Prof. Subrata Bhattacharya
4	Prof. Debjani Mitra
5	Prof. Jitendra Kumar
Associate Professor	
6	Prof. Mukul Kumar Das
7	Prof. Sushrut Das
8	Prof. Subindu Kumar
9	Prof. Santanu Dwari
10	Prof. Sanjeev Kumar Raghuvanshi

Department of Electronics Engineering	
S. No.	Name
11	Prof. Ravi Kumar Gangwar
Assistant Professor	
12	Prof. Nirupama Mandal
13	Prof. Raghvendra Kumar Chaudhary
14	Prof. Mrinal Sen
15	Prof. Rajeev Kumar Ranjan
16	Prof. Devendra Chack
17	Prof. Jaisingh Thangaraj
18	Prof. Amitesh Kumar
19	Prof. Kaushik Mazumdar
20	Prof. Govind Murmu
21	Prof. Rahul Bhattacharya
22	Prof. Himanshu Bhusan Mishra
23	Prof. Manodipan Sahoo
Visiting Assistant Professor	
24	Prof. Aparna Neettiyath
25	Prof. Mohd. Tasleem Khan
Emeritus Fellow	
26	Prof. Virendra Kumar

Department of Environmental Science and Engineering

S. No.	Name
Professor	
1	Prof. Gurdeep Singh
2	Prof. Subodh Kumar Maiti
3	Prof. Sunil Kumar Gupta
Associate Professor	
4	Prof. Biswajit Paul
5	Prof. Prasoon Kumar Singh
6	Prof. Manish Kumar Jain
7	Prof. Alok Sinha
8	Prof. Anshumali
9	Prof. Saravanan Pichiah
10	Prof. Sukha Ranjan Samadder
11	Prof. Vipin Kumar
Assistant Professor	
12	Prof. Suresh Pandian E.
13	Prof. Sheeja Jagadevan
14	Prof. Brijesh Kumar Mishra

Department of Fuel, Minerals and Metallurgical Engineering

S. No.	Name
Professor	
1	Prof. Rajiv Shekhar
2	Prof. R. Venugopal
3	Prof. Nikkam Suresh
4	Prof. Sumantra Bhattacharya
5	Prof. N. R. Mandre
Assistant Professor	
6	Prof. Shalini Gautam
7	Prof. Barun Kumar Nandi
8	Prof. Shatrughan Soren
9	Prof. Anand Anupam
10	Prof. Shravan Kumar
11	Prof. Pankaj Kumar Jain
12	Prof. Kesavan Ravi
Visiting Professor	
13	Prof. Rakesh Kumar
Adjunct Professor	
14	Prof. Sanjay Kali

Department of Humanities and Social Sciences

S. No.	Name
Associate Professor	
1	Prof. Ajit Kumar Behura
2	Prof. Md. Mojibur Rahman
3	Prof. Rajni Singh
Assistant Professor	
4	Prof. Aju Aravind
5	Prof. Sarita Kar
6	Prof. Nirban Manna
7	Prof. Gyan Prakash
8	Prof. Namrata Sharma
9	Prof. Ahmed Sameer
Visiting Assistant Professor	
10	Prof. Banti Deori

Department of Management Studies

S. No.	Name
Professor	
1	Prof. Pramod Pathak
2	Prof. Chandan Bhar
3	Prof. J. K. Pattanayak
4	Prof. Govind Swaroop Pathak
Associate Professor	
5	Prof. Saumya Singh

Personnel

Department of Management Studies	
S. No.	Name
6	Prof. Sandeep Mondal
7	Prof. Niladri Das
8	Prof. Mrinalini Pandey
9	Prof. Bibhas Chandra
Assistant Professor	
10	Prof. Kuthambalayan Sridhar Thyagaraj
11	Prof. Mohd. Irfan
12	Prof. Krishnendu Shaw
13	Prof. Aparna Krishna
14	Prof. Shashank Bansal
15	Prof. Himanshu Gupta
16	Prof. Rashmi Singh
17	Prof. Shikha Singh
Visiting Assistant Professor	
18	Prof. Shrawan Kumar Trivedi
19	Prof. Ruhi Sonal
Adjunct Professor	
20	Prof. Vinod Tahiliani

Department of Mathematics and Computing

S. No.	Name
Professor	
1	Prof. Shishir Gupta
2	Prof. Garib Nath Singh
3	Prof. Ranjit Kumar Upadhyay
4	Prof. Mritunjay Kumar Singh
5	Prof. Subhashis Chatterjee
6	Prof. Akhilesh Prasad
Associate Professor	
7	Prof. Seetala Prasad Tiwari
8	Prof. Badam Singh Kushvah
9	Prof. Anurag Jayswal
10	Prof. Santimoy Kundu
11	Prof. Abhishek Kumar Singh
Assistant Professor	
12	Prof. Pentyala Srinivasa Rao
13	Prof. Abhay Kumar Singh
14	Prof. Gajendra Kumar Vishwakarma
15	Prof. Dinabandhu Pradhan
16	Prof. Abha Rani
17	Prof. Pramod Kumar Kewat
18	Prof. Sanjeev Anand Sahu
19	Prof. Ramanababu Kaligatla
20	Prof. Nabakumar Jana
21	Prof. A. Antony Selvan
22	Prof. Shuvashree Mondal

Visiting Assistant Professor	
23	Prof. Ashish Bhatt
Emeritus Fellow	
24	Prof. Gauri Shanker Seth

Department of Mechanical Engineering

S. No.	Name
Professor	
1	Prof. Randip Kumar Das
Associate Professor	
2	Prof. Kailash Jha
3	Prof. Somnath Chattopadhyaya
4	Prof. Shailendra Narayan Singh
5	Prof. Sanjoy K. Ghoshal
6	Prof. Nirmal Kumar Singh
7	Prof. Amit Rai Dixit
8	Prof. Ashis Mallick
9	Prof. Rabindra Nath Hota
10	Prof. Kalyan Kumar Singh
11	Prof. Subrata Kumar Ghosh
12	Prof. Alok Kumar Das
13	Prof. P. K. Mahato
Assistant Professor	
14	Prof. Shibayan Sarkar
15	Prof. Subhankar Sen
16	Prof. Subramanian Narayan
17	Prof. Rakesh Kumar
18	Prof. Md. Sikandar Azam
19	Prof. Amitava Mandal
20	Prof. Madan Lal Chandravanshi
21	Prof. Sachin Kumar Singh
22	Prof. Deepak Kumar Mandal
23	Prof. Pawan Kumar Singh
24	Prof. Vivek Bajpai
25	Prof. Satyabrata Sahoo
26	Prof. Swagata Bhaumik
27	Prof. Arun Dayal Udai
Visiting Assistant Professor	
28	Prof. Amlan Kar
Adjunct Professor	
29	Prof. Janakarajan Ramkumar

Department of Mining Engineering

S. No.	Name
Professor	
1	Prof. Durga Charan Panigrahi
2	Prof. Upendra Kumar Singh
3	Prof. M. Jawed

Department of Mining Engineering	
S. No.	Name
4	Prof. V. M. S. R. Murthy
5	Prof. Arvind Kumar Mishra
6	Prof. Dheeraj Kumar
Associate Professor	
7	Prof. R. M. Bhattacharjee
8	Prof. Devi Prasad Mishra
9	Prof. Partha Sarathi Paul
10	Prof. Bhanwar Singh Choudhary
Assistant Professor	
11	Prof. Rabindra Kumar Sinha
12	Prof. Gnananandh Budi
13	Prof. Kashinath Pal
14	Prof. Hemant Kumar
15	Prof. Villuri Vasanta Govind Kumar
16	Prof. Mohammad Soyeb Alam
17	Prof. Patitapaban Sahu
18	Prof. Radhakanta Koner
Professor (on Contract)	
19	Prof. Sheo Shankar Rai
Visiting Professor	
20	Prof. Y. P. Chugh
Visiting Assistant Professor	
21	Prof. Siddharth Agarwal
Chair Professor	
22	Prof. Subhas Chandra Bhowmik
Adjunct Professor	
23	Prof. Vijay Kumar Sinha
24	Prof. Vinod Prasad Sinha

Department of Mining Machinery Engineering

S. No.	Name
Professor	
1	Prof. Kabir Dasgupta
2	Prof. Alok Kumar Mukhopadhyay
Associate Professor	
3	Prof. Lakshmi Annamalai Kumaraswamidhas
4	Prof. Tanmoy Maity
Assistant Professor	
5	Prof. Jayanta Das
6	Prof. Niranjana Kumar
7	Prof. Tanweer Alam
8	Prof. K. Priya Ajit
9	Prof. Dinkar Brajeshkumar Kishorilal

10	Prof. Ajit Kumar
11	Prof. Ananda Shankar Hati
12	Prof. Rashmi Ranjan Das
13	Prof. Tanmay Dutta
Emeritus Fellow	
14	Prof. Tarun Kumar Chatterjee

Department of Petroleum Engineering

S. No.	Name
Professor	
1	Prof. Tarkeshwar Kumar
2	Prof. A. K. Pathak
3	Prof. Ashutosh Kumar
4	Prof. Keka Ojha
5	Prof. Vikas Mahto
6	Prof. Ajay Mandal
Associate Professor	
7	Prof. Chandan Guria
8	Prof. Rajeev Upadhyay
9	Prof. Ajay Suri
10	Prof. Tarun Kumar Naiya
Assistant Professor	
11	Prof. Vinay Kumar Rajak
12	Prof. Archana
13	Prof. Neetish Kumar Maurya
Emeritus Fellow	
14	Prof. Sukumar Laik
Adjunct Professor	
15	Prof. Shyamal Bhattacharya
16	Prof. Siddhartha Sur

Department of Physics

S. No.	Name
Professor	
1	Prof. Jairam Manam
2	Prof. Anil Kumar Nirala
3	Prof. Bobby Kachappilly Antony
4	Prof. Vineet Kumar Rai
Associate Professor	
5	Prof. Shailendra Kumar Sharma
6	Prof. Asit Kumar Kar
7	Prof. Vinod Kumar Singh
8	Prof. Pankaj Mishra
Assistant Professor	
9	Prof. Ram Bilash Choudhary
10	Prof. Kaushal Kumar
11	Prof. Sridhar Sahu

Personnel

Department of Physics	
S. No.	Name
12	Prof. Rajalingam Thangavel
13	Prof. Jhasaketan Nayak
14	Prof. P. M. Sarun
15	Prof. Rakesh Singh Moirangthem
16	Prof. Umakanta Tripathy
17	Prof. Prashant Kumar Sharma
18	Prof. Binata Panda
19	Prof. Amitava Adak
Visiting Assistant Professor	
20	Prof. Tusharkanti Dey

List of Faculty Members under INSPIRE Scheme as on 31/03/2020.

S. No.	Name	Department
1	Prof. Sukhendu Nandi	Chemistry
2	Prof. Apurba Sinhamahapatra	Chemical Engineering
3	Prof. Chiranjib Banerjee	Environmental Science & Engineering
4	Prof. Kalyan Koley	Electronics Engineering

List of Newly Appointed Faculty Members during the period 01/04/2019 to 31/03/2020.

S. No	Name	Designation	Department	Date of Joining
1	Prof. Alik Sundar Majumdar	Assistant Professor	Applied Geology	01-04-2019
2	Prof. Piyush Sarkar	Visiting Assistant Professor	Applied Geophysics	27-09-2019
3	Prof. Ejaz Ahmad	Assistant Professor	Chemical Engineering	10-10-2019
4	Prof. Vivek Shankar Pinnamaraju	Assistant Professor	Chemical Engineering	25-11-2019
5	Prof. Prashant Kumar Gupta	Assistant Professor	Chemical Engineering	09-12-2019
6	Prof. Vikky Anand	Visiting Assistant Professor	Chemical Engineering	28-10-2019
7	Prof. Renu V.	Assistant Professor	Civil Engineering	25-06-2019
8	Prof. Laxmidhar Behera	Adjunct Professor	Computer Science and Engineering	01-03-2020
9	Prof. Ranveer Singh	Visiting Assistant Professor	Computer Science and Engineering	06-12-2019
10	Prof. Madhulika Mohanty	Visiting Assistant Professor	Computer Science and Engineering	09-12-2019
11	Prof. Gadadhar Sahoo	Visiting Professor	Computer Science and Engineering	05-02-2020
12	Prof. Aparna Neettiyath	Assistant Professor	Electronics Engineering	17-12-2019
13	Prof. Mohd. Tasleem Khan	Visiting Assistant Professor	Electronics Engineering	28-02-2020

S. No	Name	Designation	Department	Date of Joining
14	Prof. Kesavan Ravi	Assistant Professor	Fuel, Minerals and Metallurgical Engineering	09-03-2020
15	Prof. Rakesh Kumar	Visiting Professor	Fuel, Minerals and Metallurgical Engineering	22-07-2019
16	Prof. Banti Deori	Assistant Professor	Humanities and Social Sciences	01-07-2019
17	Prof. Namrata Sharma	Assistant Professor	Humanities and Social Sciences	08-08-2019
18	Prof. Ahmed Sameer	Assistant Professor	Humanities and Social Sciences	25-02-2020
19	Prof. Aparna Krishna	Assistant Professor	Management Studies	17-07-2019
20	Prof. Shashank Bansal	Assistant Professor	Management Studies	26-09-2019
21	Prof. Himanshu Gupta	Assistant Professor	Management Studies	23-10-2019
22	Prof. Rashmi Singh	Assistant Professor	Management Studies	18-11-2019
23	Prof. Shikha Singh	Assistant Professor	Management Studies	18-12-2019
24	Prof. Shrawan Kumar Trivedi	Visiting Assistant Professor	Management Studies	02-09-2019
25	Prof. Ruhi Sonal	Visiting Assistant Professor	Management Studies	30-01-2020
26	Prof. A Antony Selvan	Assistant Professor	Mathematics and Computing	15-04-2019
27	Prof. Shuvashree Mondal	Assistant Professor	Mathematics and Computing	15-10-2019
28	Prof. Swagata Bhaumik	Assistant Professor	Mechanical Engineering	15-05-2019
29	Prof. Rakesh Kumar	Assistant Professor	Mechanical Engineering	08-06-2019
30	Prof. Arun Dayal Udai	Assistant Professor	Mechanical Engineering	13-01-2020
31	Prof. Amlan Kar	Visiting Assistant Professor	Mechanical Engineering	06-12-2019
32	Prof. Vijay Kumar Sinha	Adjunct Professor	Mining Engineering	01-07-2019
33	Prof. Vinod Prasad Sinha	Adjunct Professor	Mining Engineering	01-07-2019
34	Prof. Siddharth Agarwal	Visiting Assistant Professor	Mining Engineering	17-03-2020
35	Prof. Y. P. Chugh	Visiting Professor	Mining Engineering	06-01-2020
36	Prof. Amitava Adak	Assistant Professor	Physics	02-03-2020
37	Prof. Tusharkanti Dey	Visiting Assistant Professor	Physics	01-11-2019

Personnel

List of Faculty Members Retired/Resigned/ Tenure Completed during the period 01/04/2019 to 31/03/2020.

S. No.	Name	Designation	Department	Date of Retirement/ Leaving	Reason For Leaving
1	Prof. Alok Krishna Gupta	Adjunct Professor	Applied Geology	19-04-2019	Tenure Completed
2	Prof. Bani Mukherjee	Professor	Mathematics and Computing	30-04-2019	Retirement
3	Dr. Brijesh Eshpuniyani	Visiting Associate Professor	Mechanical Engineering	07-05-2019	Resigned
4	Prof. Sumit Mukhopadhyay	Visiting Professor	Petroleum Engineering	08-05-2019	Resigned
5	Prof. S. P. Banerjee	Adjunct Professor	Environmental Science & Engineering	17-05-2019	Tenure Completed
6	Prof. Ashok Varma	Adjunct Professor	Petroleum Engineering	17-05-2019	Tenure Completed
7	Prof. Rakesh Kumar	Assistant Professor	Mining Engineering	28-05-2019	Resigned
8	Prof. Antoine Bittar	Visiting Professor	Physics	30-05-2019	Tenure completed
9	Prof. Seshadri Seetharaman	Visiting Professor	Fuel, Minerals and Metallurgical Engineering	31-05-2019	Tenure Completed
10	Prof. Gauri Shanker Seth	Professor	Mathematics and Computing	30-06-2019	Retirement
11	Prof. Debasish Datta	Adjunct Professor	Electronics Engineering	30-06-2019	Tenure Completed
12	Prof. Ashish Ghosh	Adjunct Professor	Computer Science & Engineering	15-07-2019	Tenure Completed
13	Prof. Mihir K. Sinha	Adjunct Professor	Management Studies	24-07-2019	Tenure Completed
14	Prof. Pradeep Prasad	Adjunct Professor	Management Studies	24-07-2019	Tenure Completed
15	Shri Deepak Agrawal	Adjunct Professor	Petroleum Engineering	24-07-2019	Tenure Completed
16	Prof. S. Dey	Adjunct Professor	Mathematics and Computing	24-07-2019	Tenure Completed
17	Prof. A. K. Singh	Rajiv Gandhi Chair Professor	Environmental Science & Engineering	31-07-2019	Tenure completed
18	Prof. Prabir Kumar Sarkar	Professor	Mechanical Engineering	01-08-2019	Voluntary Retirement
19	Shri N. D. Rao	Adjunct Professor	Fuel, Minerals and Metallurgical Engineering	21-09-2019	Tenure Completed

S. No.	Name	Designation	Department	Date of Retirement/Leaving	Reason For Leaving
20	Prof. Sudhanshu Shekhar Jamuar	Professor (on Contract)	Electronics Engineering	27-11-2019	Tenure Completed
21	Prof. Simit Raval	Adjunct Professor	Mining Engineering	28-12-2019	Tenure Completed
22	Prof. Suranjan Ghosh	Adjunct Professor	Computer Science & Engineering	14-02-2020	Tenure Completed
23	Prof. Om Prakash	NMDC Chair Professor	Mining Engineering	17-03-2020	Tenure completed
24	Prof. P. R. Mohanty	Professor	Applied Geophysics	31-03-2020	Retirement

List of Officers as on 31/03/2020.

S. No.	Name	Designation	Department/Section
1	Dr. Pramod Mathur (on deputation)	Registrar (Additional Charge) (upto 10/02/2020) & Joint Registrar (E&A)	Administration
2	Dr. Partha De	Librarian/Advisor, Special Projects	Administration
3	Dr. Kaushik Mondal	Principal Systems Engineer	Computer Centre
4	Shri Prabodh Pandey	Deputy Registrar	Finance & Accounts
5	Shri Pradhan Rajesh Kr. Sinha	Deputy Registrar	Establishment
6	Shri Anil Kumar	Deputy Registrar	Internal Audit
7	Shri Ranti Dev Sharma	Deputy Registrar	Examination & Academic
8	Shri S. Ghosh	Dy. Superintending Engineer	Campus Maintenance Unit
9	Dr. Praveen Kumar	CMO (SAG)	Health Centre
10	Dr.(Mrs) T.Banerjee	CMO (NFSG)	Health Centre
11	Shri R. K. Mishra	Systems Engineer	Computer Centre
12	Shri Rakesh Soni	Systems Engineer	Computer Centre
13	Shri U. P. Sharma	Technical Officer	Petroleum Engineering
14	Shri D. N. Acharya	PE&SO	Sports & Physical Education Centre
15	Shri Satish Kumar	Assistant Librarian	Central Library
16	Dr. Dipankar Ray	Assistant Systems Engineer	Computer Centre
17	Shri Anakapali Kumaraswamy	Assistant Systems Engineer	Computer Centre
18	Shri M. S. Champia (on lien)	Assistant Registrar	Finance & Accounts
19	Ms. S. Kaur	Assistant Registrar	Establishment
20	Shri M. N. Pandey	Assistant Registrar	O/o Dean (SW)
21	Shri Dhananjay Kumar	Assistant Registrar	Purchase & Store
22	Shri Rahul Kumar	Assistant Registrar	Purchase & Store/Estate
23	Shri Naveen Kumar	Assistant Registrar	O/o Dean (Faculty)

Personnel

S. No.	Name	Designation	Department/Section
24	Shri Kamesh Kanchan Katariar	Assistant Registrar	Finance & Accounts
25	Shri Shailendra Bhatia	AWS	Central Workshop
26	Shri Brijesh Kr. Pandey	Assistant Registrar (Official Language)	Examination & Academic
27	Dr. Dhiraj Kumar	Horticulture Officer	Campus Administration
28	Shri Ram Manohar	Sr. Security Officer	Campus Administration
29	Shri Arbind Kumar Singh	Assistant Executive Engineer	Campus Maintenance Unit
30	Shri Pratik Kumar	Assistant Executive Engineer	Campus Maintenance Unit

List of Newly Appointed Officers during the period 01/04/2019 to 31/03/2020.

S. No.	Name	Designation	Department/ Section	Date of Joining
1	Shri Naveen Kumar	Assistant Registrar	Dean (Faculty)	04-04-2019
2	Shri Kamesh Kanchan Katariar	Assistant Registrar	Finance & Accounts	11-03-2020
3	Shri Ranti Dev Sharma	Deputy Registrar	Examination & Academic	18-03-2020

List of Officers Retired/Resigned during the period 01/04/2019 to 31/03/2020.

S. No.	Name	Designation	Department/ Section	Date of Retirement/ Resignation	Retirement/ Resignation
1	Shri Rajeev Kumar	Dy. Registrar	Purchase & Store	25-04-2019	Resigned
2	Dr. (Col.) M. K. Singh	Registrar	Administration	26-05-2019	Retired

PART - B

**INDIAN INSTITUTE OF TECHNOLOGY
(INDIAN SCHOOL OF MINES),
DHANBAD**



**ANNUAL ACCOUNTS FOR THE
FINANCIAL YEAR 2019-20**

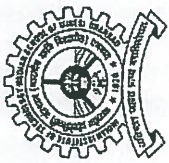


**INDIAN INSTITUTE OF TECHNOLOGY
(INDIAN SCHOOL OF MINES), DHANBAD**

ANNUAL ACCOUNTS 2019-20

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BALANCE SHEET AS ON 31ST MARCH, 2020

		(Amount in Rs)				
	Sch No	Non Plan 2019-20	Plan 2019-20	Project 2019-20	Total Current year 2019-20	Total Previous Year 2018-19
CORPUS/ CAPITAL FUND AND LIABILITIES						
CAPITAL FUND	I	615,012,975.22	8,801,790,331.50	476,512,290.55	9,893,315,597.27	9,280,869,192.47
RESERVE AND SURPLUS	II	740,195,182.85	-	137,712,817.03	877,907,999.88	419,441,281.40
EARMARKED/ ENDOWMENT FUND	III	864,952,879.84	-	223,751,463.69	1,088,704,343.53	884,382,211.38
SECURED LOANS	IV	875,600,000.00	-	-	875,600,000.00	365,300,000.00
CURRENT LIABILITIES AND PROVISIONS	V	463,938,961.60	307,931,800.37	1,286,518,426.40	2,058,389,188.37	1,598,010,333.29
TOTAL		3,559,699,999.51	9,109,722,131.87	2,124,494,997.67	14,793,917,129.05	12,548,003,018.54
ASSETS						
FIXED ASSETS						
LESS: PROVISION FOR DEPRECIATION	VI	1,792,618,127.00	10,944,252,007.19	832,647,847.73	13,569,517,981.92	12,072,111,046.92
NET BLOCK (FIXED ASSETS)		161,693,853.09	2,367,136,149.70	464,793,787.95	2,993,623,790.75	2,659,895,377.06
INVESTMENTS FROM EARMARKED/ENDOWMENT FUNDS	VII	1,630,924,273.91	8,577,115,857.49	367,854,059.78	10,575,894,191.17	9,412,215,669.86
INVESTMENTS-OTHERS	VIII	602,386,735.93	-	203,990,662.75	806,377,398.68	674,719,192.33
CURRENT ASSETS, LOANS, ADVANCES	IX	975,942,036.00	197,612,017.27	1,460,682,898.02	2,634,236,951.29	2,081,443,899.11
TOTAL		3,559,699,999.51	9,109,722,131.87	2,124,494,997.67	14,793,917,129.05	12,548,003,018.54
SIGNIFICANT ACCOUNTING POLICIES	XX					
CONTINGENT LIABILITIES AND NOTES ON ACCOUNTS	XXI					

Prabodh Pandey
 (PRABODH PANDEY)
 DY. REG (F&A) REGISTRAR(ACTG.)

J. K. Pattanayak
 (PROF. J. K. PATTANAYAK)
 DY DIRECTOR

Rajiv Shekhar
 (PROF RAJIV SHEKHAR)
 DIRECTOR



UDIN: 20917339AAM6D9777



INCOME AND EXPENDITURE ACCOUNT FOR THE PERIOD 1.4.2019 TO 31.3.2020

INCOME	Sch No	(Amount in Rs)				
		Non Plan 2019-20	Plan 2019-20	Project 2019-20	Total Current year 2019-20	Total Previous Year 2018-19
Grants-in-aid from MHRD, GOI		2,099,932,061.00	990,000,000.00	-	3,089,932,061.00	2,380,000,000.00
Less: Transferred to Capital Fund towards non recurring expenses		1,577,566.00	748,973,772.40	-	750,551,338.40	700,000,000.00
Less: Transferred to Unutilised Grants towards advance to CPWD	X	-	186,500,000.00	-	186,500,000.00	-
Less: Unspent GIA transferred to Unutilised Grants		-	54,526,227.60	-	54,526,227.60	-
Net Grants in Aid		2,098,354,495.00	-	-	2,098,354,495.00	1,680,000,000.00
Academic Receipts	XI	537,815,748.16	-	-	537,815,748.16	523,076,710.90
Interest Earned	XII	2,838,866.00	281,797.00	81,447,860.43	84,568,523.43	89,267,450.62
Other Income	XIII	92,420,422.11	106,612.00	-	92,527,034.11	76,814,181.64
TOTAL (A)		2,731,429,531.27	388,409.00	81,447,860.43	2,813,265,800.70	2,369,158,343.16
EXPENDITURE						
Establishment Expenses	XIV	1,438,058,851.82	-	-	1,438,058,851.82	1,261,539,469.00
Academic Expenses	XV	550,231,835.83	-	-	550,231,835.83	657,511,376.12
Administrative & General Expenses	XVI	202,577,880.28	496,350.00	-	203,074,230.28	176,142,751.00
Repair & Maintenance	XVII	54,150,695.00	3,177,338.00	-	57,328,033.00	68,240,704.00
Transportation Expenses	XVIII	3,385,859.00	-	-	3,385,859.00	5,369,382.00
Miscellaneous/ other Expenses	XIX	3,660,762.86	7,245.40	4,243.90	3,672,252.16	5,203,164.07
Interest on HEFA Loan		43,101,689.00	-	-	43,101,689.00	8,782,099.00
Prior Period Expenses		-	-	-	-	629,020.00
Total Expenditure before depreciation (B)		2,295,167,573.79	3,680,933.40	4,243.90	2,298,852,751.09	2,183,417,965.19
Surplus/(Deficit) before Depreciation (C)		436,261,957.48	(3,292,524.40)	81,443,616.53	514,413,049.61	185,740,377.97
Depreciation of Plan & Non Plan. Depreciation of Project A/c transferred to Capitalised Fund for Assets (D)	VI	14,972,897.71	252,300,049.53	-	267,272,947.24	231,485,679.53
Surplus/(Deficit) after Depreciation(C - D)		421,289,059.78	(255,592,573.93)	81,443,616.53		
Transfer to HEFA Building Reserve and IRG Reserve		409,086,892.00	-	-		
Surplus/(Deficit) transferred to Capital Fund Plan and Non Plan. Project surplus transferred to Non Plan Endowment Fund		12,202,167.77	(255,592,573.93)	81,443,616.53		
Significant Accounting Policies	XX					
Contingent Liabilities and Notes on Accounts	XXI					

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K Pattanayak
 (PROF. K PATTANAYAK)
 DY DIRECTOR

Rajiv Shekhar
 (PROF RAJIV SHEKHAR)
 DIRECTOR



UDIN: 20 41932 9AAA 0809777



**INDIAN INSTITUTE OF TECHNOLOGY (ISM)
RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED ON 31st MARCH, 2020**

RECEIPTS	Sch No.	Non Plan 2019-20	Plan 2019-20	Project 2019-20	Total Current Year 2019-20	Total Previous Year 2018-19
I. Opening Balances	R 1					
(a) Cash Balances		12,157.20	-	-	12,157.20	18,744.20
(b) Bank Balances						
i. In Current Accounts		3,518,917.10	1,857,241.75	229,648.03	5,605,806.88	3,681,173.28
ii. In Deposit Accounts		-	-	-	-	-
iii. In Savings Accounts		90,138,922.14	15,710,111.76	31,947,115.58	137,796,149.48	47,370,404.25
II. Grants Received	R 2					
a) From Government of India		2,085,031,061.00	990,000,000.00	-	3,075,031,061.00	2,380,000,000.00
b) From State Government		-	-	-	-	-
c) From other sources (details)		-	-	-	-	-
III. Academic Receipts	R 3	551,200,461.31	-	-	551,200,461.31	529,908,710.00
IV. Receipts against Earmarked / Endowment Funds / Other Reserve Funds	R 4	35,214,090.00	-	48,169,874.70	83,383,964.70	61,019,204.00
V. Receipts against Sponsored Projects / Schemes / Others	R 5	-	-	287,355,887.04	287,355,887.04	698,801,663.98
VI. Receipts against sponsored Fellowships and Scholarships	R 6	8,772,263.00	-	6,922,987.00	15,695,250.00	13,765,199.00
VII. Interest received on:	R 7					
a) Bank Deposits		32,068,848.00	18,293,656.00	9,684,042.30	60,046,546.30	59,014,610.00
b) Loans & Advances		930,602.00	-	757.00	931,359.00	409,658.00
c) Savings Bank Accounts		893,735.00	281,797.00	792,147.00	1,967,679.00	2,868,382.82
VIII. Investments encashed	R 8	-	-	-	-	-
IX. Term Deposits with Schedules Banks encashed	R 9	2,008,565,922.00	915,000,000.00	493,196,564.00	3,416,762,486.00	2,716,809,999.00
X. Other Income (including Prior Period Income)	R 10	36,385,830.28	139,606.00	-	36,525,436.28	32,161,664.86
XI. Deposits and Advances	R 11	56,980,426.00	6,432,456.00	22,064,245.00	85,477,127.00	278,607,101.23
XII. Miscellaneous Receipts including Statutory Receipts	R 12	211,596,664.00	4,424,820.00	277,093,030.35	493,114,514.35	272,157,759.30
XIII. Any Other Receipts	R 13	387,644,600.00	-	339,736,678.11	727,381,278.11	515,950,312.53
Total		5,508,954,499.03	1,952,139,688.51	1,517,192,976.11	8,978,287,163.65	7,612,544,586.45



PAYMENTS	Sch No.	Non Plan 2019-20	Plan 2019-20	Project 2019-20	Total Current Year 2019-20	Total Previous Year 2018-19
I. Expenses:						
a) Establishment Expenses	P.1.1	1,193,670,346.82	-	-	1,193,670,346.82	1,161,827,281.00
b) Academics Expenses	P.1.2	561,142,407.98	-	-	561,142,407.98	657,053,480.22
c) Administrative Expenses	P.1.3	197,701,472.28	-	-	197,701,472.28	206,691,480.00
d) Transportation Expenses	P.1.4	3,120,349.00	-	-	3,120,349.00	5,283,264.00
e) Other expenses - Miscellaneous	P.1.5	3,530,309.86	7,245.40	48,237.90	3,585,793.16	5,031,061.35
f) Repairs & Maintenance	P.1.6	50,920,259.00	-	-	50,920,259.00	54,238,077.00
g) Prior Period Expenses	P.1.7	-	-	-	-	49,278.00
h) Interest on HEFA Loan	P.1.8	43,101,689.00	-	-	43,101,689.00	-
II. Payments against Earmarked / Endowment Funds / Other Reserve Funds	P 2	3,638,400.00	-	12,470,138.00	16,108,538.00	15,714,740.49
III. Payments against sponsored Projects / Schemes	P 3	-	-	542,396,706.53	542,396,706.53	430,683,063.90
IV. Payments against Sponsored Fellowships / Scholarships	P 4	17,996,699.00	-	9,250,638.00	27,247,337.00	11,191,072.00
V. Term Deposits with Scheduled Banks	P 5	2,380,668,208.00	1,000,000,000.00	440,671,335.00	3,821,339,543.00	2,874,300,000.00
VI. Expenditure on Fixed Assets and Capital Works-in-Progress						
a) Fixed Assets	P 6	1,687,863.00	664,975,341.00	-	666,663,204.00	702,176,516.00
b) Capital Works-in-Progress						
VII. Other Payments including statutory payments	P 7	210,909,674.44	4,905,079.00	96,548,959.20	312,363,712.64	285,877,496.00
VIII. Refunds of Grants	P 8	-	-	-	-	-
IX. Deposits and Advances	P 9	55,086,740.00	275,308,001.00	32,360,733.00	362,755,474.00	178,745,718.70
X. Other Payments	P 10	702,896,086.00	-	311,743,751.00	1,014,639,837.00	880,267,944.23
XI. Closing Balances						
(a) Cash in hand		54,108.20	-	350,000.00	404,108.20	12,157.20
(b) Bank Balances						
i. In Current Accounts		2,452,210.70	1,890,235.75	229,648.03	4,572,094.48	5,605,806.88
ii. In Deposit Accounts		80,377,675.75	5,053,786.36	71,122,829.45	156,554,291.56	137,796,149.48
iii. In Savings Accounts		5,508,954,499.03	1,952,139,688.51	1,517,192,976.11	8,978,287,163.65	7,612,544,586.45
Total						

Prabodh Pandey

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Prof J K Pattanayak

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DY DIRECTOR

Prof Rajiv Shekhar

(PROF RAJIV SHEKHAR)
DIRECTOR





SCHEDULES TO BALANCE SHEET AS AT 31ST MARCH, 2020

SCHEDULE - I: CAPITAL FUND		(Amount in Rs)			
Sl.No.	PARTICULARS	Current Year : 2019-20		Previous Year : 2018-19	
1 (A) Plan:					
1.1.1	Opening Balance	8,308,409,133.03		7,829,511,933.76	
1.1.2	Add : Previous Year Adjustment	-		-	
1.1.3	Add : Non-recurring grants-in-aid received during the year	748,973,772.40		700,000,000.00	
1.1.4	Less : Deficit	255,592,573.93		221,102,800.73	
1.1.5	Sub-total		8,801,790,331.50		8,308,409,133.03
1 (B) Non Plan:					
1.2.1	Opening Balance	573,270,125.45		619,510,998.21	
1.2.2	Add: Transfer from CPF	-		-	
1.2.3	Add: Income Tax Refund	3,576,366.00		-	
1.2.4	Add: Adjustments during the Year	570,772.00		125,000.00	
1.2.5	Add: Surplus	12,202,167.77	589,619,431.22	46,115,872.76	573,270,125.45
1.2.6	Capitlaised fund for Assets (Opening Bal)	23,749,538.00		15,796,041.00	
1.2.7	Add : Capitlaised fund for Assets (During the Yr)	1,644,006.00	25,393,544.00	7,953,497.00	23,749,538.00
1.2.8	Sub-total		615,012,975.22		597,019,663.45
1 (C) Project:					
1.3.1	(a) Capital Fund	121,173,812.44		121,173,812.44	
	Less: Adjustment during the year	300,000.00	120,873,812.44	-	121,173,812.44
1.3.2	(b) Project Endowment Fund		249,515.69		249,515.69
1.3.3	(c) Reserve fund		6,830,829.87		6,830,829.87
1.3.4	(d) Corpus Fund		4,410,060.50		4,410,060.50
1.3.5	(e) Capitlaised fund for Assets (OB)	242,776,177.49		231,280,879.43	
1.3.6	Add: Additions during the year	167,827,361.00		65,793,638.00	
1.3.7	Less: Depreciation on Assets including adjustment for previous years	66,455,466.44	344,148,072.05	54,298,339.94	242,776,177.49
1.3.8	Sub-total		476,512,290.55		375,440,395.99
1.A	CAPITAL FUND - PLAN		8,801,790,331.50		8,308,409,133.03
1.B	CAPITAL FUND - NON PLAN		615,012,975.22		597,019,663.45
1.C	CAPITAL FUND - PROJECT		476,512,290.55		375,440,395.99
1	TOTAL (CAPITAL FUND)		9,893,315,597.27		9,280,869,192.47

SCHEDULE - II: RESERVES AND SURPLUS					
Capital Reserve (Non Plan):					
Sl.No.	PARTICULARS	Balance as on 01.04.2019	Additions during the year	Deduction/Adj during the year	Balance as on 31.03.2020
2.20 Non-Plan:					
2.2.1	Building Fund	4,250,000.00	-	-	4,250,000.00
2.2.2	Departmental Development Fund	133,045.00	-	-	133,045.00
2.2.3	Donation Fund	2,057,500.00	-	-	2,057,500.00
2.2.4	HEFA - Building Fund Reserve	134,700,000.00	269,400,000.00	-	404,100,000.00
2.2.5	Library Development Fund	310,536.00	-	-	310,536.00
2.2.6	IRG Reserve	-	139,686,892.00	-	139,686,892.00
2.2.7	School Development Fund	30,202,232.50	4,238,500.35	30,000.00	34,410,732.85
2.2.8	Student Innovative Project Fund	131,346,477.00	27,415,000.00	3,515,000.00	155,246,477.00
2.2.9	Total Reserves (Non Plan)	302,999,790.50	440,740,392.35	3,545,000.00	740,195,182.85
RESERVES (PROJECTS):					
Sl.No.	PARTICULARS	Balance as on 01.04.2019	Additions during the year	Deduction/Adj during the year	Balance as on 31.03.2020
2.3' RESERVES (PROJECTS):					
2.3.1	Department Development Fund	56,443,408.63	19,931,540.35	4,795,056.00	71,579,892.98
2.3.2	Professional Development Fund	29,084,838.10	5,586,075.00	2,736,056.00	31,934,857.10
2.3.3	Outreach Activity	358,076.00	1,598,571.00	-	1,956,647.00
2.3.4	General Maintenance Fund	30,555,168.17	2,976,351.78	1,290,100.00	32,241,419.95
2.3.5	Sub-total (Reserves)	116,441,490.90	30,092,538.13	8,821,212.00	137,712,817.03
2.A	RESERVE & SURPLUS - PLAN	-	-	-	-
2.B	RESERVE & SURPLUS - NON PLAN	302,999,790.50	440,740,392.35	3,545,000.00	740,195,182.85
2.C	RESERVE & SURPLUS - PROJECT	116,441,490.90	30,092,538.13	8,821,212.00	137,712,817.03
2	TOTAL (RESERVE & SURPLUS)	419,441,281.40	470,832,930.48	12,366,212.00	877,907,999.88



SCHEDULE - III: EARMARKED/ ENDOWMENT FUNDS:					
3.2 Non Plan:					
S No	Particulars	Balance as on 01.04.2019	Additions during the year	Deduction/Adj during the year	Balance as on 31.03.2020
3.2.1	Basant Scholarship Fund	182,537.00	27,353.70	17,746.00	192,144.70
3.2.2	Benevolent Fund	7,827,288.64	142,177.00	400.00	7,969,065.64
3.2.3	Budhwanti Mrig Memo. Sch.Fund	8,933,800.00	1,753,346.69	1,138,908.00	9,548,238.69
3.2.4	Director's Discretionary Fund	4,267.00			4,267.00
3.2.5	Endowment Fund (Corpus fund under B.G.Scheme)	614,626,258.47	215,643,236.58	26,869,631.00	803,399,864.05
3.2.6	HOD Discretionary Fund	81,278.00			81,278.00
3.2.7	House Building Revolving Fund	7,741,437.00			7,741,437.00
3.2.8	Ishan Rajbanshi Merit Scholarship	838,618.00	93,135.07	63,529.00	868,224.07
3.2.9	ISM Alumni Award Fund	2,596,957.00	131,059.48	504,249.00	2,223,767.48
3.2.10	ISS Scholarship Fund	229,278.00	83,012.98	89,476.00	222,814.98
3.2.11	Late J D M Dhawan M G Med End Fund	146,725.00	27,353.70	16,111.00	157,967.70
3.2.12	Matching grant for Deptt Societies	184,800.00			184,800.00
3.2.13	Mess Subsidy Fund	10,743,235.00			10,743,235.00
3.2.14	Platinum Jubilee Fund	2,500.00			2,500.00
3.2.15	Student Aid Fund	114,487.00			114,487.00
3.2.16	Student Medical Fund	17,444,360.00	3,700,800.00	18,000.00	21,127,160.00
3.2.17	Student Welfare Fund	213,090.00			213,090.00
3.2.18	V M Salgaocar Memorial Sch Fund	165,444.00	14,238.53	21,144.00	158,538.53
3.2.19	Sub-total Non Plan	672,076,360.11	221,615,713.73	28,739,194.00	864,952,879.84
3.3 Project: Chair & Scholarship Funds (Earmarked Funds)					
S No	Particulars	Balance as on 01.04.2019	Additions during the year	Deduction/Adj during the year	Balance as on 31.03.2020
(A) Scholarship / Award Funds					
3.3.1	ATLAS COPCO SCH. FUND	639,154.46	664,447.16	673,951.46	629,650.16
3.3.2	Bhaskar Bhattacharya Memorial Fund	815,572.90	49,875.92	19,036.91	846,411.91
3.3.3	D N Prasad Memorial Fund	125,814.10			125,814.10
3.3.4	Inderjeet & Satyawat Bodhwar Scholarship	337,860.18	39,081.12	17,475.18	359,466.12
3.3.5	Inder Mohan Thapar Foundation Research Award	-	350,000.00	300,000.00	50,000.00
3.3.6	ISM AANA Scholarship Award	226,740.00	4,885,289.00	4,973,248.00	138,781.00
3.3.7	Late Mrs. Chitra Bhattacharya Memorial Fund	330,471.61	26,920.91	17,581.61	339,810.91
3.3.8	L J JHONSON AWARD	289,655.51	265,781.09	257,581.51	297,855.09
3.3.9	Mata Gurdev Kaur Memorial Fund	41,151.00		6,990.00	34,161.00
3.3.10	Mitali Sen Gold Medal Memorial End. Fund	356,425.00		31,490.00	324,935.00
3.3.11	NAA Scholarship Fund	840,261.10	57,913.36	25,495.10	872,679.36
3.3.12	Nirja Sahay Memorial Fund	101,978.84	27.08	11,826.84	90,179.08
3.3.13	N K Mukherjee Memorial Fund	96,171.00			96,171.00
3.3.14	Paritosh & Patikrit End. Fund	314,276.00		5,000.00	309,276.00
3.3.15	Petroleum Deptt. Endow Fund	445,171.16			445,171.16
3.3.16	Platinum Jublee Fund	567,792.11			567,792.11
3.3.17	Poonam (Khanna) Singh Endowmend Mem. Fund	1,764,063.12	115,656.43	143,500.12	1,736,219.43
3.3.18	Prof N L Sharma Mem Fund	240,394.00			240,394.00
3.3.19	Prof S P Bannerjee Gold Medal Award	636,000.00			636,000.00
3.3.20	Prof S Srinivasan Mem. Fund	81,996.00			81,996.00
3.3.21	Renuka Rajhans Memorial Gold Medal Fund	389,150.24	20,574.75	11,961.24	397,763.75
3.3.22	Rollong Scholarship	124,501.00			124,501.00
3.3.23	Sandvik Scholarship	-	3,750,000.00	3,750,000.00	-
3.3.24	S.L Sehgal Scholarship	457,403.00			457,403.00
3.3.25	Smt. Kaushalia Devi Gold Medal	265,631.00			265,631.00
3.3.26	Smt. Sneha Lata Srivastava Memorial Gold Medal	237,317.03	30,348.97	13,214.03	254,451.97
3.3.27	Subarna & Shashibhushan Bharracharya Mem End Fund	296,341.00			296,341.00
3.3.28	Vishesvaraya Ph.D Scheme for Elec. & IT	357,366.00		1,000.00	356,366.00
3.3.29	Total Scholarship/Award Funds	10,378,657.36	10,255,915.79	10,259,352.00	10,375,221.15



(B) Chair Funds:					
3.3.30	CIL Chair for Mining Deptt.	24,241,259.96	5,979,053.21	62,577.52	30,157,735.65
3.3.31	MOLE Chair Professor Fund	11,855,388.03	1,005,079.00	126,885.03	12,733,582.00
3.3.32	NMDC Chair for Open Cast Mining	26,511,590.44	2,387,208.56	2,675,523.94	26,223,275.06
3.3.33	ONGC Chair	13,394,815.24	5,469,433.47	5,247,323.66	13,616,925.05
3.3.34	Rajeev Gandhi Memorial Chair	23,138,563.38	2,167,491.78	905,419.30	24,400,635.86
3.3.35	Rungta Chair	21,546,829.02	312,292.00	2,728,044.02	19,131,077.00
3.3.36	SAIL NMDC Chair (Gr.Rs.5000000)	31,251,036.35	13,941,572.13	11,810,237.87	33,382,370.61
3.3.37	Sandvik Chair Prof. Fund	5,947,696.06	421,373.34	43,223.06	6,325,846.34
3.3.38	Tata Steel Chair	27,824,181.12	2,837,043.99	1,099,090.62	29,562,134.49
3.3.39	URANIUM CHAIR	16,215,834.31	8,179,669.48	6,552,843.31	17,842,660.48
3.3.40	Total Chair Funds	201,927,193.91	42,700,216.96	31,251,168.33	213,376,242.54
3.3.41	Total Chairs & Scholarship funds	212,305,851.27	52,956,132.75	41,510,520.33	223,751,463.69
3.3.42	EARMARKED/ ENDOWMENT FUND - PLAN	-	-	-	-
3.3.43	EARMARKED/ ENDOWMENT FUND - N PLAN	672,076,360.11	221,615,713.73	28,739,194.00	864,952,879.84
3.3.44	EARMARKED/ ENDOWMENT FUND - PROJECT	212,305,851.27	52,956,132.75	41,510,520.33	223,751,463.69
3	TOTAL EARMARKED/ ENDOWMENT FUND	884,382,211.38	274,571,846.48	70,249,714.33	1,088,704,343.53

SCHEDULE- IV: SECURED LOANS					
S No	Particulars	Balance as on 01.04.2019	Additions during the year	Deduction/Adj during the year	Balance as on 31.03.2020
Non Plan:					
4.2.1	Loan from HEFA	365,300,000.00	779,700,000.00	269,400,000.00	875,600,000.00
	Total	365,300,000.00	779,700,000.00	269,400,000.00	875,600,000.00

SCHEDULE- V: CURRENT LIABILITIES & PROVISIONS					
PLAN					
(A) Statutory Liabilities(Plan):					
A	Particulars	Balance as on 01.04.2019	Additions during the year	Deduction/Adj during the year	Balance as on 31.03.2020
5.1.1	Income Tax	178,612.00	862,650.00	953,776.00	87,486.00
5.1.2	Income Tax 94 J	125,800.00	1,052,248.00	1,160,048.00	18,000.00
5.1.3	Income Tax - Employees	-	-	-	-
5.1.4	Labour Welfare CESS	89,311.00	391,969.00	437,706.00	43,574.00
5.1.5	TDS - CGST	77,459.00	524,718.00	553,444.00	48,733.00
5.1.6	TDS - IGST	403,590.00	1,068,517.00	1,246,661.00	225,446.00
5.1.7	TDS - SGST	77,459.00	524,718.00	553,444.00	48,733.00
5.1.8	Sub Total	952,231.00	4,424,820.00	4,905,079.00	471,972.00
(B) Other Current Liabilities(Plan):					
5.1.9	BRS Liability	775,325.50	32,994.00	-	808,319.50
5.1.10	Earnest/Security Money-contractors	12,486,615.00	6,432,456.00	4,340,206.00	14,578,865.00
5.1.11	Jasper Hostel	67,500.00	-	67,500.00	-
5.1.12	Miscellaneous Receipt	82.00	-	-	82.00
5.1.13	Non Plan Control A/c	(435,256.00)	630,679.00	66,401.00	129,022.00
5.1.14	Non Plan Control Endowment A/c	15,120,148.00	18,626,349.27	435,256.00	33,311,241.27
5.1.15	Unutilised Grants	-	241,026,227.60	-	241,026,227.60
5.1.16	Project Control Account	(249,929.00)	-	-	(249,929.00)
5.1.17	Retention Money	-	-	-	-
5.1.18	Sub-total	27,764,485.50	266,748,705.87	4,909,363.00	289,603,828.37
(C) Provisions (Plan):					
5.1.19	Provisions for Books & Journals	-	-	-	-
5.1.20	Provisions for Power Augmentation	17,856,000.00	-	-	17,856,000.00
5.1.21	Sub-total	17,856,000.00	-	-	17,856,000.00
5.1.22	Total Current Liabilities & Provisions (Plan)	46,572,716.50	271,173,525.87	9,814,442.00	307,931,800.37
NON PLAN					
(A) Statutory Liabilities(Non-Plan):					
B	Particulars	Balance as on 01.04.2019	Additions during the year	Deduction/Adj during the year	Balance as on 31.03.2020
5.2.1	CGST	15,796.50	286,681.50	301,348.72	1,129.28
5.2.2	IGST	9,810.00	118,055.00	118,865.00	9,000.00
5.2.3	SGST	15,796.50	286,681.50	301,348.72	1,129.28
5.2.4	TDS - CGST (Non Plan)	55,989.00	987,365.00	963,725.00	79,629.00



5.2.5	TDS - IGST (Non Plan)	46,574.00	2,074,301.00	1,761,561.00	359,314.00
5.2.6	TDS - SGST (Non Plan)	55,989.00	987,365.00	963,725.00	79,629.00
5.2.7	Income Tax (TDS) - Contractors	146,139.00	3,466,375.00	3,127,154.00	485,360.00
5.2.8	Income Tax (TDS) - Employees	134,122.00	128,058,733.00	127,889,098.00	303,757.00
5.2.9	Income Tax (TDS) - (Professional)	145,446.00	3,538,051.00	3,161,348.00	522,149.00
5.2.10	Income Tax (TDS) - U/S 194 I	1,620.00	-	1,620.00	-
5.2.11	Jharkhand State Prof. Tax	174,426.00	1,202,381.00	1,170,908.00	205,899.00
5.2.12	Labour Welfare	33,784.00	325,605.00	302,409.00	56,980.00
5.2.13	TDS - CGST (Plan)	-	545,069.00	545,069.00	-
5.2.14	TDS - IGST (Plan)	-	1,246,661.00	1,246,661.00	-
5.2.15	TDS - SGST (Plan)	-	545,069.00	545,069.00	-
5.2.16	Income Tax (TDS) - Plan	-	953,776.00	953,776.00	-
5.2.17	Income Tax (TDS) - Plan-Profession	-	1,160,048.00	1,160,048.00	-
5.2.18	CGST (Project)	-	5,328,673.50	5,328,673.50	-
5.2.19	IGST (Project)	-	17,440,583.00	17,440,583.00	-
5.2.20	SGST (Project)	-	5,328,673.50	5,328,673.50	-
5.2.21	TDS - CGST (Project)	51,937.00	1,356,763.00	1,408,700.00	-
5.2.22	TDS - IGST (Project)	59,120.00	960,358.00	1,019,428.00	50.00
5.2.23	TDS - SGST (Project)	51,937.00	1,356,763.00	1,408,700.00	-
5.2.24	Interest on CGST - Project	-	7,506.00	7,506.00	-
5.2.25	Interest on IGST - Project	-	28,982.00	28,982.00	-
5.2.26	Interest on SGST - Project	-	7,506.00	7,506.00	-
5.2.27	Income Tax (TDS) - Empl-Projct	5,000.00	29,301,412.00	29,306,412.00	-
5.2.28	Income Tax (TDS) - Contr-Project	106,955.00	2,436,935.00	2,543,890.00	-
5.2.29	Project Income Tax (Professional)	296,400.00	547,681.00	844,081.00	-
5.2.30	Project Interest on Income Tax	-	804.00	804.00	-
5.2.31	Project Interest on TDS(IGST)	-	121.00	121.00	-
5.2.32	Project Interest on TDS(CGST)	-	177.00	177.00	-
5.2.33	Project Interest on TDS(SGST)	-	177.00	177.00	-
5.2.34	Project Service Tax	-	1,188,290.00	1,188,290.00	-
5.2.35	Sub Total	1,406,841.00	211,073,622.00	210,376,437.44	2,104,025.56
(B) Other Liabilities(Non-Plan):					
5.2.36 Current Liabilities - Inter Unit					
5.2.37	GPF Subscription & Loan Recovery	1,000.00	75,047,458.00	75,047,458.00	1,000.00
5.2.38	P.F. Control A/c	500.00	999,500.00	1,000,000.00	-
5.2.39	Loan from Project for Salary	30,168,074.00	-	30,168,074.00	-
5.2.40	CanBank, SDL Br. Loan to Employees	-	3,723,651.00	3,723,651.00	-
5.2.41	Children Act. Centre Subscription	5,210.00	168,375.00	167,025.00	6,560.00
5.2.42	Court Attachment Deduction	-	46,800.00	46,800.00	-
5.2.43	DCPS SUBSCRIPTION	534,996.00	45,176,448.00	44,683,500.00	1,027,944.00
5.2.44	GIS Premium	920,519.00	1,620,580.00	2,691,036.00	(149,937.00)
5.2.45	LIC Premium	31,047.00	5,677,142.00	5,671,067.00	37,122.00
5.2.46	LTC & Other Recoveries from Employees	77,910.00	-	77,910.00	-
5.2.47	NEW GIS SCHEME	-	356,411.00	-	356,411.00
5.2.48	PM Releif Fund	-	1,115,723.00	1,115,723.00	-
5.2.49	Post Office CTD/RD	-	231,100.00	231,100.00	-
5.2.50	Relief Fund(DEATH BENEFIT PAYABLE)	64,593.00	-	-	64,593.00
5.2.51	SBI Cash Award for Non Teaching Employees	25,000.00	-	-	25,000.00
5.2.52	Scolomin Club	5,400.00	321,050.00	311,950.00	14,500.00
5.2.53	Staff Recreation Club	500.00	270,000.00	267,400.00	3,100.00
5.2.54	B R S Liability	7,070,695.55	-	-	7,070,695.55
5.2.55	JASPER HOSTEL	-	-	-	-
5.2.56	Liability Towards Convocation Deceased Labours	1,543,320.00	-	-	1,543,320.00
5.2.57	Misc. Receipts (Liab)	839,631.00	547,850.00	525,980.00	861,501.00
5.2.58	SECURITY DEPOSIT	11,337,026.00	8,349,929.00	7,484,930.00	12,202,025.00
5.2.59	EARNEST MONEY DEPOSIT	23,388,712.00	31,180,720.00	22,124,323.00	32,445,109.00
5.2.60	Alumni Subscription	5,807,500.00	1,770,000.00	67,000.00	7,510,500.00
5.2.61	Benevolent - Academic Assistance	109,935.00	2,404,142.50	48,000.00	2,466,077.50
5.2.62	Benevolent - Corpus	73,290.00	1,602,761.00	-	1,676,051.00
5.2.63	Benevolent - Medical Assistance	73,290.00	1,602,761.00	-	1,676,051.00
5.2.64	Benevolent - Receipts	2,829,855.00	5,194,154.00	8,024,009.00	-
5.2.65	Benevolent - Travelling	93,281.00	2,404,144.50	335,766.00	2,161,659.50
5.2.66	Basant Subscription	586,700.00	1,981,500.00	2,452,000.00	116,200.00
5.2.67	CAT 2 Year MBA Admission	-	1,229,308.00	-	1,229,308.00
5.2.68	CONCETTO	-	59,000.00	-	59,000.00
5.2.69	Delhi Ext. Centre, CSE	1,325,237.00	1,176,000.00	1,325,237.00	1,176,000.00
5.2.70	Delhi Ext. Centre, ECE	608,633.00	660,000.00	589,386.00	679,247.00



5.2.71	Delhi Ext. Centre, Elect. Engg.	1,058,053.00	854,000.00	38,438.00	1,873,615.00
5.2.72	Delhi Ext. Centre, Mech. Engg.	1,439,646.00	756,000.00	389,250.00	1,806,396.00
5.2.73	DST/INSPIRE/SCHOLARSHIP	(139,506.00)	139,506.00	-	-
5.2.74	Executive MBA	2,850,000.00	1,881,673.00	2,930,006.00	1,801,667.00
5.2.75	Hostel Mess Fee Liability	570,000.00	183,733,602.00	184,303,602.00	-
5.2.76	Hostel Security Deposit	12,373,500.00	-	-	12,373,500.00
5.2.77	IIT GATE M Tech Admission A/c	68,306.00	6,292,472.00	802,275.00	5,558,503.00
5.2.78	IIT JEE Advanced Admission	1,380,460.49	28,245,121.00	28,068,527.00	1,557,054.49
5.2.79	Institute Amenities Deposit	5,593,000.00	1,770,000.00	1,028,599.00	6,334,401.00
5.2.80	Kolkata Ext. Centre, Mech. Engg.	4,133,253.00	960,000.00	435,336.00	4,657,917.00
5.2.81	Kolkata Extension Centre ECE	1,528,381.00	960,000.00	1,104,675.00	1,383,706.00
5.2.82	Kolkata Extension Centre, Elec. Engg.	7,531,170.00	3,564,000.00	189,983.00	10,905,187.00
5.2.83	Kolkata Extension Centre, CSE	2,006,683.00	984,000.00	2,006,683.00	984,000.00
5.2.84	Library Security Deposit	15,916,700.00	4,470,000.00	4,510,000.00	15,876,700.00
5.2.85	Library Security	849,187.00	-	-	849,187.00
5.2.86	Ph.D Admission	-	791,000.00	-	791,000.00
5.2.87	JAM M.Sc./M.Sc. Tech A/c	-	2,063,150.00	1,825,000.00	238,150.00
5.2.88	Central Sector Scholarship for SC	1,340,530.00	737,700.00	660,300.00	1,417,930.00
5.2.89	Central Sector Scholarship for ST STUDENT	121,500.00	893,000.00	985,400.00	29,100.00
5.2.90	MP MMVY Scholarship	3,120,517.00	2,863,490.00	4,112,949.00	1,871,058.00
5.2.91	Outside Scholarship Control A/c	3,089,109.00	3,719,591.00	4,012,386.00	2,796,314.00
5.2.92	PRAKARM 11	723.00	-	-	723.00
5.2.93	SBI Cash Award for Best Students	-	25,000.00	25,000.00	-
5.2.94	SRIJAN FUND	33,000.00	-	-	33,000.00
5.2.95	Student Activity Fund	-	9,183,000.00	7,773,500.00	1,409,500.00
5.2.96	STUDENT CAUTION MONEY	28,104,271.00	1,770,000.00	6,038,355.00	23,835,916.00
5.2.97	Student Insurance Scheme	8,496,064.00	6,806,438.00	3,209,703.00	12,092,799.00
5.2.98	Student Uniform Deposit	7,954,186.00	360,000.00	2,459,550.00	5,854,636.00
5.2.99	Unpaid Liability	176,443.00	-	-	176,443.00
5.2.100	Sub Total	197,117,031.04	458,739,251.00	465,088,842.00	190,767,440.04
(C) Outstanding Expenses / Provisions (Non-Plan)					
5.2.101	Outstanding Pay & Allowance	64,540,042.00	68,414,819.00	64,540,042.00	68,414,819.00
5.2.102	Provision for CPF Matching Contribution	16,544,187.00	5,382,240.00	-	21,926,427.00
5.2.103	Provision for Interest on HEFA Loan	8,782,099.00	-	8,782,099.00	-
5.2.104	Outstanding Electricity Charges	-	4,651,258.00	-	4,651,258.00
5.2.105	OUTSTANDING PENSION	-	12,374,992.00	-	12,374,992.00
5.2.106	GRATUITY PROVISION- NON TEACHING	-	117,000,000.00	-	117,000,000.00
5.2.107	GRATUITY PROVISION-TEACHING	-	46,700,000.00	-	46,700,000.00
5.2.108	Sub Total	89,866,328.00	254,523,309.00	73,322,141.00	271,067,496.00
Total Current Liabilities & Provisions (Non Plan)		288,390,200.04	924,336,182.00	748,787,420.44	463,938,961.60

PROJECTS

(A) Statutory Liabilities (PROJECTS):

C	Particulars	Balance as on 01.04.2019	Additions during the year	Deduction/Adj during the year	Balance as on 31.03.2020
5.3.1	Central Tax (CGST)	(1,149,870.10)	3,600,788.50	5,554,399.50	(3,103,481.10)
5.3.2	Income Tax From Contractors	(4,848.00)	2,642,116.00	2,435,009.00	202,259.00
5.3.3	INCOME TAX FROM EMPLOYEES	-	28,711,119.00	28,634,619.00	76,500.00
5.3.4	Income Tax From Employees, Rajeev Gandhi Chair	-	161,872.00	161,872.00	-
5.3.6	Income Tax From NMDC Chair (Employees)	-	530,244.00	530,244.00	-
5.3.7	Income Tax From Professional Services	-	539,531.00	536,681.00	2,850.00
5.3.9	Integrated Tax (IGST)	(1,147,660.50)	15,185,140.00	19,431,212.00	(5,393,732.50)
5.3.10	Interest on Income Tax	-	804.00	804.00	-
5.3.11	INTEREST ON TDS CGST	-	177.00	177.00	-
5.3.12	Interest on TDS on IGST	-	121.00	121.00	-
5.3.13	INTEREST ON TDS SGST	-	177.00	177.00	-
5.3.14	LABOUR WELFARE CESS	-	48,661.00	43,348.00	5,313.00
5.3.15	State Tax (SGST)	(1,151,322.10)	3,601,514.50	5,553,673.50	(3,103,481.10)
5.3.16	TDS - CGST	(1.00)	1,507,119.00	1,354,925.00	152,193.00
5.3.17	TDS - IGST	-	789,970.00	852,017.00	(62,047.00)
5.3.18	TDS - SGST	(1.00)	1,507,119.00	1,354,925.00	152,193.00
5.3.19	Sub-total	(3,453,702.70)	58,826,473.00	66,444,204.00	(11,071,433.70)
(B) CONSULTANCY & R&D PROJECTS					



A	Particulars	Balance as on 01.04.2019	Additions / Adj during the year	Deduction/Adj during the year	Balance as on 31.03.2020
5.3.20	Consultancy Services	150,641,081.70	42,780,477.60	134,859,863.43	58,561,695.87
5.3.21	Consultancy-TEST	2,311,944.70	2,227,078.10	2,417,857.00	2,121,165.80
5.3.22	Consultancy-EDP	20,479,312.10	19,149,711.00	29,012,997.10	10,616,026.00
5.3.23	Department Development Fund - TEQIP:	1,669,884.00	-	259,290.00	1,410,594.00
5.3.24	Fellowship & Associateship Funds				
5.3.25	AICTE/NDF/NK/07	217,012.00	-	-	217,012.00
5.3.26	AICTE/NDF/Shankar Purby/MS/04	45,000.00	-	-	45,000.00
5.3.27	CSIR/09/085/0114/2015-EMR-1	13,748.00	-	-	13,748.00
5.3.28	CSIR/09/85(102)2009-EMR-1	645.00	-	-	645.00
5.3.29	CSIR/110/2013 EMR-1	-	6,685.00	6,685.00	-
5.3.30	CSIR/112/EMRI	5,698.00	-	-	5,698.00
5.3.31	CSIR/116/2016-EMR-I	26.00	-	-	26.00
5.3.32	CSIR/117/2016=EMR-I	495,000.00	-	-	495,000.00
5.3.33	DST/INSPIRE	84,481.00	-	-	84,481.00
5.3.34	DST/INSPIRE FELLOWSHIP/2014 IF 140888	14,078.00	433,271.00	433,342.00	14,007.00
5.3.35	DST/Inspire Fellowship/2016/If60673/ Ranita Saha	58,000.00	310,000.00	368,000.00	-
5.3.36	DST/INSPIRE FELLOWSHIP/2016/MANOJ KR SAHOO	47,904.00	441,064.00	488,968.00	-
5.3.37	DSTINSPIRE FELLOWSHIP/2017//ARPITA ROY	35,509.00	848,791.00	534,600.00	349,700.00
5.3.38	DST/Inspire Fellowship/2017/If 170005/rajkumar	43,659.00	444,366.00	469,929.00	18,096.00
5.3.39	DST/ Inspire Fellowship/2018/If180002/ANKITA SAHAY	193,000.00	-	120,000.00	73,000.00
5.3.40	DST/INSPIRE FELLOWSHIP/2018/IF180003/VISHAL TALUKDA	193,000.00	452,240.00	410,720.00	234,520.00
5.3.41	DST/INSPIRE FELLOWSHIP/2018/IF180149/DEBAYA N BASU	191,387.00	452,000.00	410,867.00	232,520.00
5.3.42	DST/INSPIRE FELLOWSHIP/459/2013	-	320,000.00	320,000.00	-
5.3.43	DST/Inspire Fellowship/ Aliviya Bhowmick	24,510.00	378,976.00	377,098.00	26,388.00
5.3.44	DST/Inspire Fellowship/ Amit Kumar	-	368,000.00	368,000.00	-
5.3.45	DST/INSPIRE FELLOWSHIP/INJAMAMUL HAQUE/2016	48,152.00	412,416.00	399,929.00	60,639.00
5.3.46	DST/INSPIRE FELLOWSHIP/MADHUKANT THAKUR	507.00	-	-	507.00
5.3.47	DST/INSPIRE FELLOWSHIP/ M MAHANTY / 2016-17	163,852.00	491,448.00	460,000.00	195,300.00
5.3.48	PDF NBHM DAE RACHNA BHATIA	161,600.00	-	-	161,600.00
5.3.49	PMRF/570/2018-19/INSTITUTE	112,183.55	981,287.50	903,722.00	189,749.05
5.3.50	Sub-total	2,148,951.55	6,340,544.50	6,071,860.00	2,417,636.05
5.3.51	ISM R&D Projects				
5.3.52	FRS(101)/2016-17/AGP	802,130.00	-	34,394.00	767,736.00
5.3.53	FRS(10)/2010-2011/AC	6,218.00	-	6,218.00	-
5.3.54	FRS(102)/2016-17/AGP	1,000,000.00	-	-	1,000,000.00
5.3.55	FRS(103)/2016-17/AGP	986,707.00	-	996,922.00	(10,215.00)
5.3.56	FRS(104)/2016-17/CE	713,200.00	-	23,300.00	689,900.00
5.3.57	FRS(105)/2016-17/CE	1,003.00	-	-	1,003.00
5.3.58	FRS(106)/2016-17/CE	36,010.00	-	31,950.00	4,060.00
5.3.59	FRS(107)/2016-17/PE	195,219.00	-	-	195,219.00
5.3.60	FRS(108)/2016-17/ME	637,155.00	-	33,124.00	604,031.00
5.3.61	FRS(109)/2016-17/ESE	154,115.00	-	151,093.00	3,022.00
5.3.62	FRS (110)/2017-18/MECH. ENGG.	(100,000.00)	900,000.00	921,372.00	(121,372.00)
5.3.63	FRS (111)/2017-18/CIVIL ENGG.	338,256.00	624,428.00	219,450.00	743,234.00
5.3.64	FRS(11)/2010-2011/AC	2,574.00	-	2,574.00	-
5.3.65	FRS(112)/2017-18/CE	124,048.00	800,000.00	12,010.00	912,038.00
5.3.66	FRS (113)/2017-18/CHEM.ENGG	200,000.00	800,000.00	-	1,000,000.00
5.3.67	FRS(114)/17-18/ME	140,274.00	859,726.00	216,473.00	783,527.00



5.3.68	FRS (115)/2017-18/PE	200,000.00	800,000.00	800,570.00	199,430.00
5.3.69	FRS(116)/17-18/EE	193,346.00	800,000.00	302,729.00	690,617.00
5.3.70	FRS(117)/2017-18/ECE	14,575.00	-	-	14,575.00
5.3.71	FRS (118)/2017-18/ECE	200,000.00	800,000.00	881,685.00	118,315.00
5.3.72	FRS (119)/2017-18/MME	200,000.00	800,000.00	497,000.00	503,000.00
5.3.73	FRS (120)/2017-18/ME	200,000.00	800,000.00	-	1,000,000.00
5.3.74	FRS(121)/18-19/AC	176,900.00	268,935.00	953,261.00	(507,426.00)
5.3.75	FRS(12)/2010-2011/AC	885,970.00	-	885,970.00	-
5.3.76	FRS (122)/18-19/AC	5,687.00	-	-	5,687.00
5.3.77	FRS (123)/18-19/AC	(12,248.00)	-	787,752.00	(800,000.00)
5.3.78	FRS (124)/2018-19/MECH. ENGG.	100,000.00	-	671,353.00	(571,353.00)
5.3.79	FRS (125)/2018-19/AM	200,000.00	-	-	200,000.00
5.3.80	FRS (126)/2018-19/ME	200,000.00	-	-	200,000.00
5.3.81	FRS (127)/18-19/AGP	379,414.00	-	831,424.00	(452,010.00)
5.3.82	FRS(128)/2019-20/AGL	-	180,000.00	83,042.00	96,958.00
5.3.83	FRS(129)/2019-20/PE	-	250,000.00	-	250,000.00
5.3.84	FRS(130)/2019-20/PE	-	130,000.00	-	130,000.00
5.3.85	FRS(131)/2019-20/PE	-	140,000.00	-	140,000.00
5.3.86	FRS(133)/2019-20/MS	-	200,000.00	18,762.00	181,238.00
5.3.87	FRS(134)/2019-20/AM	-	100,000.00	-	100,000.00
5.3.88	FRS(14)/2010-2011/AGP	128,290.00	-	128,290.00	-
5.3.89	FRS(15)/2010-2011	130,066.00	-	130,066.00	-
5.3.90	FRS(16)/2010-2011	329,271.00	-	329,271.00	-
5.3.91	FRS(17)/2010-2011/AM	26,048.00	-	26,048.00	-
5.3.92	FRS(18)/2010-2011/APH	27,609.00	-	27,609.00	-
5.3.93	FRS(21)/2010-2011/EE	207,470.00	-	207,470.00	-
5.3.94	FRS(25)/2010-2011/ME&MME	219,971.00	-	219,971.00	-
5.3.95	FRS(27)/2010-2011/MS	432,728.00	-	432,728.00	-
5.3.96	FRS(28)/2010-2011/PE	43,480.00	-	43,480.00	-
5.3.97	FRS(30)/2012-13/AC	17,106.00	-	17,106.00	-
5.3.98	FRS(31)/2012-13/AC	20,530.00	-	20,530.00	-
5.3.99	FRS(3)/2009-10/3/AC	22,857.00	-	22,857.00	-
5.3.100	FRS(32)/2012-13/AC	9,751.00	-	9,751.00	-
5.3.101	FRS(33)/2012-13/AM	275,100.00	-	275,100.00	-
5.3.102	FRS(34)/2012-13/APH	327,349.00	-	327,349.00	-
5.3.103	FRS(35)/2012-13/EE	10,115.00	-	10,115.00	-
5.3.104	FRS(42)/2012-13/PE	66.00	-	66.00	-
5.3.105	FRS(43)/13-14/AC	15,365.00	-	15,365.00	-
5.3.106	FRS(44)/13-14/AC	67.00	-	67.00	-
5.3.107	FRS(45)/13-14/AC	70.00	-	70.00	-
5.3.108	FRS(47)/13-14/AGL	124,673.00	-	124,673.00	-
5.3.109	FRS(48)/13-14/AGL	23,032.00	-	23,032.00	-
5.3.110	FRS(51)/13-14/APH	11,074.00	-	11,074.00	-
5.3.111	FRS(52)/13-14/APH	108,305.00	-	108,305.00	-
5.3.112	FRS(53)/13-14/APH	113,097.00	-	113,097.00	-
5.3.113	FRS(55)/13-14/APH	177.00	-	177.00	-
5.3.114	FRS(56)/13-14/CHE	520,909.00	-	520,909.00	-
5.3.115	FRS(57)/13-14/CHE	141.00	-	141.00	-
5.3.116	FRS(59)/13-14/CHE	6,383.00	-	6,383.00	-
5.3.117	FRS(60)/13-14/CHE	73.00	-	73.00	-
5.3.118	FRS(61)/13-14/CHE	240.00	-	240.00	-
5.3.119	FRS(6)/2009-10/6/ME&MME	300,000.00	-	300,000.00	-
5.3.120	FRS(65)/13-14/FME	655,425.00	-	655,425.00	-
5.3.121	FRS(66)/13-14/FME	33,166.00	-	33,166.00	-
5.3.122	FRS(67)/13-14/FME	324,423.00	-	324,423.00	-
5.3.123	FRS(68)/13-14/FME	68,230.00	-	68,230.00	-
5.3.124	FRS(70)/13-14/MECH	25,996.00	-	25,996.00	-
5.3.125	FRS(71)/13-14/MECH	1,940.00	-	1,940.00	-
5.3.126	FRS(73)/2014-15/AC	27.00	-	27.00	-
5.3.127	FRS(75)/2014-15/APH	48,285.00	-	48,285.00	-
5.3.128	FRS(8)/2009-10/8/CSE	195,197.00	-	195,197.00	-
5.3.129	FRS(83)/2014-15/ECE	74,088.00	-	74,088.00	-
5.3.130	FRS(85)/2014-15/ECE	675,000.00	-	675,000.00	-
5.3.131	FRS(86)/2014-15/ESE	2,725.00	-	2,725.00	-
5.3.132	FRS(87)/2014-15/FME	576,305.00	-	576,305.00	-
5.3.133	FRS(88)/2014-15/HSS	225,000.00	-	225,000.00	-
5.3.134	FRS (90)/2015-16/CE	62,406.00	-	62,406.00	-
5.3.135	FRS(91)2015-16/CE	53.00	-	53.00	-
5.3.136	FRS(9)/2009-10/9/CSE	150,145.00	-	150,145.00	-
5.3.137	FRS(92)2015-16/CE	47,877.00	-	47,877.00	-
5.3.138	FRS(93)/2015-16/ME	1,228,189.00	-	1,228,189.00	-
5.3.139	FRS(94)/2015-16/MECH. ENGG.	49,984.00	-	49,984.00	-



5.3.140	FRS(96)/2015-16/MECH. ENGG.	246,619.00	-	246,619.00	-
5.3.141	FRS(97)/2015-16/MECH. ENGG.	4,125.00	-	4,125.00	-
5.3.142	FRS(98)/2015-16/MECH. ENGG.	7,069.00	-	7,069.00	-
5.3.143	FRS(99)/2015-16/MME	160,000.00	-	160,000.00	-
5.3.144	Sub-total	16,494,240.00	9,253,089.00	17,676,115.00	8,071,214.00
5.3.145	R&D Projects:				
5.3.146	ARDB(MoD)/534/MECH.ENGG/17-18	1,613,600.00	-	1,590,402.00	23,198.00
5.3.147	BCCL/645/2019-20/CIVIL ENGG.	-	740,000.00	525,478.00	214,522.00
5.3.148	BCCL/677/2019-20/ME	-	461,539.00	-	461,539.00
5.3.149	BCCL/682/2019-20/FMME	-	219,600.00	-	219,600.00
5.3.150	BCCL/688/2019-19/ME	-	1,006,153.00	544,615.00	461,538.00
5.3.151	CIL/410/AGP/2014-15	9,027,031.00	2,583,032.00	1,220,532.00	10,389,531.00
5.3.152	CIL/461/2015-16/MINING ENGG.	80,222,677.00	50,000,000.00	53,727,134.00	76,495,543.00
5.3.153	CIL/474/CHEM. ENGG/2016-17	18,166,967.00	1,679,640.00	18,846,607.00	1,000,000.00
5.3.154	CIL/479/ME/2016-17	27,081,474.00	-	4,133,609.00	22,947,865.00
5.3.155	CIL/514/FME/2017-18	112,860,232.00	8,028,368.00	104,338,181.00	16,550,419.00
5.3.156	CIL/539/CHEMICAL ENGG/2017-18	151,397,868.00	-	6,681,451.00	144,716,417.00
5.3.157	CIL/540/MINING ENGG/2017-18	124,660,994.00	-	3,900,427.00	120,760,567.00
5.3.158	CIL/563/ME/18-19	8,454,550.00	9,745,762.00	1,811,309.00	16,389,003.00
5.3.159	CIL/655/2019-20/ME	-	33,400,180.00	942,850.00	32,457,330.00
5.3.160	CME-4079	445,269.00	-	-	445,269.00
5.3.161	CME-ENVIS	342,181.00	1,844,134.00	2,070,030.00	116,285.00
5.3.162	CPRI/492/2016-17/ME	5,464,069.00	-	3,058,761.00	2,405,308.00
5.3.163	CSIR/250/AC	541,645.00	-	-	541,645.00
5.3.164	CSIR/327/ME/2012-13	385,092.00	-	-	385,092.00
5.3.165	CSIR/369/PE/2013-14	1,949.00	-	-	1,949.00
5.3.166	CSIR/371/AC/13-14	28,965.00	-	-	28,965.00
5.3.167	CSIR/406/2014-15/FME	304,795.00	-	-	304,795.00
5.3.168	CSIR/430/15-16/AM	74,903.00	-	74,903.00	-
5.3.169	CSIR/467/APP. PHYSICS/2016-17	213,217.00	97,200.00	307,336.00	3,081.00
5.3.170	CSIR/468/AM/2016-17	443,815.00	-	-	443,815.00
5.3.171	CSIR/469/AM/2016-17	163,653.00	-	136,969.00	26,684.00
5.3.172	CSIR/470/2016-17/EE	46,854.00	-	23,829.00	23,025.00
5.3.173	CSIR/518/AM/2017-18	108,682.00	771,068.00	381,323.00	498,427.00
5.3.174	CSIR/520/AM/2017-18	116,575.00	-	44,575.00	72,000.00
5.3.175	CSIR/521/17-18/CSE	135,323.00	-	13,066.00	122,257.00
5.3.176	CSIR/522/2017-18/AM	43,013.00	-	16,817.00	26,196.00
5.3.177	CSIR/525/APPLIED CHEM./2017-18	5,272.00	299,894.00	20,766.00	284,400.00
5.3.178	CSIR/572/AC/2018-19	98,331.00	151,075.00	97,917.00	151,489.00
5.3.179	CSIR/573/AC/2018-19	-	114,583.00	113,884.00	699.00
5.3.180	CSIR/574/2018-19/PE	818,384.00	-	370,926.00	447,458.00
5.3.181	CSIR/658/CHEMISTRY/2019-20	-	800,000.00	212,308.00	587,692.00
5.3.182	CSIR/659/M&C/2019-20	-	724,000.00	181,093.00	542,907.00
5.3.183	CSIR/663/ECE/2019-20	-	925,858.00	711,565.00	214,293.00
5.3.184	DAE/375/AGL/2013-14	304,885.00	-	-	304,885.00
5.3.185	DAE/386/APH/2014-15	939,110.00	-	-	939,110.00
5.3.186	DAE/575/ECE	2,560,542.00	53,750.00	2,600,707.00	13,585.00
5.3.187	DAE/669/2019-20/AGP	-	1,628,650.00	112,950.00	1,515,700.00
5.3.188	DBT/440/FME/2015-16	366,274.00	64,333.00	430,607.00	-
5.3.189	DMT INDIA/583/AM/2018-19	196,822.00	-	77,595.00	119,227.00
5.3.190	DRDO/444/MECH.ENGG/2015-16	53,498.00	50,066.00	103,564.00	-
5.3.191	DRDO/491/AC/2016-17	814,492.00	44,076.00	814,492.00	44,076.00
5.3.192	DRDO/494/MECH. ENGG./2016-17	2,935,580.00	-	1,416,365.00	1,519,215.00
5.3.193	DRDO/531/MECH.ENGG/2017-18	820,000.00	-	-	820,000.00
5.3.194	DRDO/569/MECH. ENGG/2018-19	525,531.00	350,000.00	852,068.00	23,463.00
5.3.195	DRDO/581/ECE/2018-19	781,452.00	1,330,611.00	1,544,063.00	568,000.00
5.3.196	DRDO/604/2018-19/MECH. ENGG.	294,076.00	399,956.00	639,036.00	54,996.00
5.3.197	DRDO/680/ECE/2019-20	-	194,400.00	41,461.00	152,939.00
5.3.198	DST/161/ME&MME	194,409.00	-	-	194,409.00
5.3.199	DST/214/AC/07-08	3,393.00	-	-	3,393.00
5.3.200	DST/216/ME/07-08	95,341.00	-	-	95,341.00
5.3.201	DST/223/AM/08-09	86,307.00	-	-	86,307.00
5.3.202	DST/244/MEMME/08-09	5,810.00	-	-	5,810.00
5.3.203	DST/269/AP/10-11	2,978.00	-	-	2,978.00
5.3.204	DST/272/AC/10-11	1,000.00	-	-	1,000.00
5.3.205	DST/274/AM/10-11	24,178.00	-	-	24,178.00
5.3.206	DST/276/AGL/10-11	160,000.00	-	-	160,000.00
5.3.207	DST/281/AC/10-11	1,000.00	-	-	1,000.00
5.3.208	DST/299/2011-12/APH	327,626.00	-	-	327,626.00
5.3.209	DST/301/AGL/11-12	634.00	-	-	634.00
5.3.210	DST/32/2019-20/APH	-	333,000.00	222,772.00	110,228.00



5.3.211	DST/33/CSE/2019-20	-	900,000.00	899,464.00	536.00
5.3.212	DST/34/MATH/19-20/GIAN	-	544,000.00	544,000.00	-
5.3.213	DST/350/2013-14/PE	30,821.00	-	-	30,821.00
5.3.214	DST/35/MS/ME/2019-20/GIAN	-	608,000.00	354,761.00	253,239.00
5.3.215	DST/361/AGL (FIST)/2013-14	9,899,031.00	-	4,176,376.00	5,722,655.00
5.3.216	DST/363/CE	148,141.00	-	34,096.00	114,045.00
5.3.217	DST/36/NSS/MS/19-20	-	387,000.00	148,120.00	238,880.00
5.3.218	DST/372/2013-14/AC(FIST)	368,239.00	-	-	368,239.00
5.3.219	DST/373/APPL. PHY./13-14	-	265,638.00	228,094.00	37,544.00
5.3.220	DST/374/2013-14/AC	14,508.00	-	-	14,508.00
5.3.221	DST/376/APH/13-14	965,780.00	9,434,220.00	-	10,400,000.00
5.3.222	DST/378/APPL. PHY/13-14	1,796.00	-	1,769.00	27.00
5.3.223	DST/379/APPLIED PHYSICS/13-14	1,540,863.00	-	-	1,540,863.00
5.3.224	DST/381/2013-14/ESE	42,660.00	-	-	42,660.00
5.3.225	DST/383/APPL. PHYSICS/13-14	500,308.00	-	-	500,308.00
5.3.226	DST/384/AGP/14-16	616.00	-	-	616.00
5.3.227	DST/387/2014-15/AC	8,139.00	-	-	8,139.00
5.3.228	DST/389/FME/2014-15	698.00	-	-	698.00
5.3.229	DST/391/ME/2014-15	17,100.00	-	-	17,100.00
5.3.230	DST/393/AM (FIST)/2014-15	194,895.00	7,605.00	-	202,500.00
5.3.231	DST/395/MS/14-15	90.00	-	-	90.00
5.3.232	DST/403/PE/2014-15	2,580,155.00	-	5,733,055.00	(3,152,900.00)
5.3.233	DST/405/MECH/2014-15	180,072.00	-	34,500.00	145,572.00
5.3.234	DST/418/AC	486,024.00	35,000.00	519,681.00	1,343.00
5.3.235	DST/420/15-16/CSE	9,355.00	-	9,355.00	-
5.3.236	DST/422/2015-16/ APPL. CHEMISTRY	260,059.00	300,000.00	482,736.00	77,323.00
5.3.237	DST/423/AGL/2015-16	1,000.00	-	-	1,000.00
5.3.238	DST/427/2015-16/AM	327,319.00	-	-	327,319.00
5.3.239	DST/432/15-16/ECE	13,439.00	-	6,903.00	6,536.00
5.3.240	DST/432/2015-16/APH	750.00	-	750.00	-
5.3.241	DST/433/2015-16/APPL. PHY.	1,000.00	48,000.00	49,000.00	-
5.3.242	DST/442/ECE/2015-16	41,710.00	-	-	41,710.00
5.3.243	DST/446/MME/15-16	87,505.00	-	58,505.00	29,000.00
5.3.244	DST /447/AGL/128/15-16	24,967.00	-	-	24,967.00
5.3.245	DST/448/2015-16/CHEM.ENGG	35,103.00	-	-	35,103.00
5.3.246	DST/452/SERB/AGL/15-16	1,844,595.00	600,000.00	2,373,775.00	70,820.00
5.3.247	DST/454/MECHANICAL/2015	255.00	-	255.00	-
5.3.248	DST/455/MECHANICAL ENGG/2015-16	380,257.00	-	380,257.00	-
5.3.249	DST/457/APPLIED GEOLOGY/2015-16	322,553.00	-	-	322,553.00
5.3.250	DST/458/ELECTRICAL ENGG	30,048.00	-	48.00	30,000.00
5.3.251	DST/459/CIVIL ENGG/2015-16	527,178.00	-	499,236.00	27,942.00
5.3.252	DST/460/CIVIL ENGG/2015-16	37,720.00	12,630.00	50,350.00	-
5.3.253	DST/462/ESE/2016-17	50,000.00	-	50,000.00	-
5.3.254	DST/466/16-17/CE	46,199.00	-	34,389.00	11,810.00
5.3.255	DST/475/AC/2016-17	37,202.00	70,000.00	89,454.00	17,748.00
5.3.256	DST/477/PE/2016-17	414,728.00	607,305.00	461,162.00	560,871.00
5.3.257	DST/478/AC/2016-17	1,023,124.00	-	-	1,023,124.00
5.3.258	DST/480/MME/2016-17	945,811.00	106,888.00	716,899.00	335,800.00
5.3.259	DST/482/AM/16-17	141,170.00	220,000.00	246,117.00	115,053.00
5.3.260	DST/483/MECH. ENG./2016-17	339,495.00	423,426.00	687,338.00	75,583.00
5.3.261	DST/485/AM/2016-17	97,033.00	230,000.00	263,087.00	63,946.00
5.3.262	DST/486/Inspire/AGP/2016-17	397,600.00	-	350,017.00	47,583.00
5.3.263	DST/488/MECH. ENGG./2016-17	307,751.00	60,687.00	144,730.00	223,708.00
5.3.264	DST/489/ME/2016-17	1,439,807.00	169,103.00	1,528,850.00	80,060.00
5.3.265	DST/490/MECH. ENGG./2016-17	323,779.00	400,000.00	472,206.00	251,573.00
5.3.266	DST/496/2016-17/AC	164,854.00	600,000.00	375,629.00	389,225.00
5.3.267	DST/497/CE/2016-17 (SERB)	100,002.00	400,000.00	418,995.00	81,007.00
5.3.268	DST/498/CSE/2016-17	53,033.00	380,210.00	404,070.00	29,173.00
5.3.269	DST/499/2016-17/ECE	455,007.00	544,137.00	842,717.00	156,427.00
5.3.270	DST/501/2016-17/AM	199,195.00	-	183,361.00	15,834.00
5.3.271	DST /503/ECE/2016-17	189,814.00	719,402.00	796,975.00	112,241.00
5.3.272	DST/504/PE/2016-17	1,732,639.00	453,000.00	613,498.00	1,572,141.00
5.3.273	DST/505/2016-17/ESE	3,137,063.00	192,399.00	2,667,431.00	662,031.00
5.3.274	DST/506/AM/2016-17	347,034.00	300,000.00	535,183.00	111,851.00
5.3.275	DST/507/2016-17/AGP	481,318.00	54,426.00	397,827.00	137,917.00
5.3.276	DST/508/PDF/AC/2016-17	-	126,143.00	126,143.00	-
5.3.277	DST/509/AC/2016-17	257,557.00	606,497.00	709,260.00	154,794.00
5.3.278	DST/510/AM/2016-17	212,680.00	300,000.00	426,221.00	86,459.00
5.3.279	DST/511/ME/2017-18	459,999.00	-	342,968.00	117,031.00



5.3.280	DST/512/2017-18/AM	280,711.00	313,850.00	250,288.00	344,273.00
5.3.281	DST/517/CE/2017-18	522,457.00	-	272,573.00	249,884.00
5.3.282	DST/523/MECH. ENGG./2017-18	1,799,509.00	452,544.00	1,760,351.00	491,702.00
5.3.283	DST/524/CSE/2017-18	5,320.00	283,825.00	278,119.00	11,026.00
5.3.284	DST/526/ESE/17-18	57,628.00	250,000.00	261,027.00	46,601.00
5.3.285	DST/527/CIVIL ENGG./17-18	730,474.00	514,650.00	292,459.00	952,665.00
5.3.286	DST/529/AC/2017-18	89,711.00	550,000.00	581,976.00	57,735.00
5.3.287	DST/530/AGP/2017-18	321,700.00	282,262.00	377,554.00	226,408.00
5.3.288	DST/532/AM/2017-18	321,116.00	215,184.00	439,951.00	96,349.00
5.3.289	DST/533/MECH. ENGG./2017-18	2,722,449.00	-	295,184.00	2,427,265.00
5.3.290	DST/536/2017-18/AGL	913,383.00	-	900,058.00	13,325.00
5.3.291	DST/542/ECE/2017-18	488,555.00	-	488,555.00	-
5.3.292	DST/544/AM/17-18	628,832.00	-	12,080.00	616,752.00
5.3.293	DST/546/MS/2017-18	83,398.00	726,079.00	704,841.00	104,636.00
5.3.294	DST/547/2017-18/ME	13,687.00	-	-	13,687.00
5.3.295	DST/550/AC/2017-18	581,472.00	430,000.00	935,838.00	75,634.00
5.3.296	DST/551/AM/17-18	156,413.00	364,752.00	303,737.00	217,428.00
5.3.297	DST/553/2017-18/AC	1,801,640.00	-	27,717.00	1,773,923.00
5.3.298	DST/554/AP/2017-18	794,746.00	-	73,905.00	720,841.00
5.3.299	DST/555/AP/2017-18	2,489,355.00	343,034.00	2,690,745.00	141,644.00
5.3.300	DST/556/ECE/18-19	71,865.00	150,000.00	13,229.00	208,636.00
5.3.301	DST/557/ME/2018-19	24,185,203.00	2,803,224.00	823,513.00	26,164,914.00
5.3.302	DST/565/2018-19/AM	471,636.00	356,071.00	428,376.00	399,331.00
5.3.303	DST/568/18-19/ECE	1,080,853.00	-	278,140.00	802,713.00
5.3.304	DST/576/AM	-	577,360.00	106,675.00	470,685.00
5.3.305	DST/577/AM/2018-19	183,480.00	120,000.00	238,201.00	65,279.00
5.3.306	DST/578/2018-19/AM	84,323.00	150,000.00	-	234,323.00
5.3.307	DST/579/2018-19/AM	139,377.00	200,000.00	251,629.00	87,748.00
5.3.308	DST/580/FIST/INSTT/2018-19	13,650,000.00	39,813.00	-	13,689,813.00
5.3.309	DST/582/AP	2,663,464.00	300,000.00	478,283.00	2,485,181.00
5.3.310	DST/587/CHEM. ENGG.	270,793.00	-	270,793.00	-
5.3.311	DST/588/APH	1,644,709.00	500,000.00	356,978.00	1,787,731.00
5.3.312	DST/590/2018-19/APH	2,039,276.00	491,371.00	1,019,659.00	1,510,988.00
5.3.313	DST/593/AGL/18-19	408,771.00	-	388,087.00	20,684.00
5.3.314	DST/594/CE/2018-19	401,727.00	-	154,968.00	246,759.00
5.3.315	DST/599/AM/2018-19	492,711.00	418,484.00	464,866.00	446,329.00
5.3.316	DST/600/AM/2018-19	376,502.00	203,765.00	320,201.00	260,066.00
5.3.317	DST/601/AGL/18-19	2,201,471.00	107,313.00	2,225,184.00	83,600.00
5.3.318	DST/602/APP. CHEMISTRY/2018-19	1,203,201.00	-	1,003,193.00	200,008.00
5.3.319	DST/603/ELECT. ENGG. 2018-19	1,607,724.00	-	1,376,104.00	231,620.00
5.3.320	DST/606/FIST/2018-19/CSE	-	4,839,000.00	2,174,931.00	2,664,069.00
5.3.321	DST/608/2018-19/AM	555,800.00	-	444,124.00	111,676.00
5.3.322	DST/609/MECH. ENGG/2018-19	811,164.00	2,700,000.00	1,908,789.00	1,602,375.00
5.3.323	DST/612/AM/2018-19	463,466.00	-	300,757.00	162,709.00
5.3.324	DST/619/2018-19/CE	2,686,667.00	24,454.00	1,289,295.00	1,421,826.00
5.3.325	DST/624/2018-19/AC	1,018,240.00	-	893,430.00	124,810.00
5.3.326	DST/626/2018-19/CSE	-	985,000.00	705,522.00	279,478.00
5.3.327	DST/627/2018-19/AGP	-	1,866,157.00	1,274,038.00	592,119.00
5.3.328	DST/628/2018-19/AGP	1,123,000.00	1,750.00	928,759.00	195,991.00
5.3.329	DST/630/2018-19/AC	1,158,033.00	26,088.00	1,032,152.00	151,969.00
5.3.330	DST/631/2018-19/APH	1,050,732.00	-	10,596.00	1,040,136.00
5.3.331	DST/632/2018-19/AP	2,531,000.00	-	952,769.00	1,578,231.00
5.3.332	DST/633/2018-19/CE	-	1,425,810.00	501,350.00	924,460.00
5.3.333	DST/634/2018-19/MECH. ENGG.	-	3,466,880.00	1,329,145.00	2,137,735.00
5.3.334	DST/635/18-19/AP	1,784,500.00	-	1,370,342.00	414,158.00
5.3.335	DST/636/2018-19/EE	-	2,840,000.00	140,466.00	2,699,534.00
5.3.336	DST/637/2018-19/M&C	-	220,000.00	100,460.00	119,540.00
5.3.337	DST/638/CHEMICAL ENGG./2018-19	-	869,200.00	265,528.00	603,672.00
5.3.338	DST/639/ECE	-	1,443,590.00	1,120,065.00	323,525.00
5.3.339	DST/640/MECH. ENGG.	-	3,220,000.00	528,475.00	2,691,525.00
5.3.340	DST/642/MME/2019-20	-	14,001,342.00	-	14,001,342.00
5.3.341	DST/643/MECH ENGG./2019-20	-	14,000,000.00	-	14,000,000.00
5.3.342	DST/647/2019-20/AGL	-	970,000.00	238,428.00	731,572.00
5.3.343	DST/650/2019-20/ELECT. ENGG.	-	2,629,628.00	1,678,153.00	951,475.00
5.3.344	DST/652/2019-20/MS	-	866,800.00	430,394.00	436,406.00
5.3.345	DST/653/2019-20/EE	-	1,985,000.00	187,175.00	1,797,825.00
5.3.346	DST/654/CSE/2019-20	-	1,105,000.00	899,838.00	205,162.00
5.3.347	DST/656/2019-20/MECH. ENGG.	-	3,154,125.00	2,050,839.00	1,103,286.00
5.3.348	DST/657/2019-20/CHEMISTRY	-	2,488,336.00	1,901,565.00	586,771.00
5.3.349	DST/661/2019-20/CHEMISTRY	-	1,240,700.00	355,594.00	885,106.00
5.3.350	DST/664/2019-20/ESE	-	3,142,000.00	190,890.00	2,951,110.00
5.3.351	DST/665/2019-20/CSE	-	429,406.00	141,943.00	287,463.00



5.3.352	DST/667/INSPIRE/2019-20/AGP	-	700,000.00	445,271.00	254,729.00
5.3.353	DST/671/2019-20/ME (CCORD)	-	29,841,240.00	578,103.00	29,263,137.00
5.3.354	DST/683/2019-20/ESE	-	4,063,000.00	675,927.00	3,387,073.00
5.3.355	DST/684/MECH. ENGG./2019-20	-	3,214,759.00	163,099.00	3,051,660.00
5.3.356	DST/690/2019-20/ECE	-	741,200.00	40,000.00	701,200.00
5.3.357	DST/694/MS/2019-20	-	220,000.00	20,000.00	200,000.00
5.3.358	DST/696/EE/2019-20	-	3,102,000.00	142,000.00	2,960,000.00
5.3.359	DST/698/2019-20/M&C	-	220,000.00	20,000.00	200,000.00
5.3.360	DST/701/2019-20/AGL	-	5,300,000.00	-	5,300,000.00
5.3.361	DST/706/2019-20/ME	-	2,518,413.00	-	2,518,413.00
5.3.362	DST/(FICCI)/19-20/681/ESE	-	330,000.00	219,860.00	110,140.00
5.3.363	DST(FICCI)/646/ESE/19-20	-	311,667.00	282,650.00	29,017.00
5.3.364	DST(FIST)/140/2016-17/471/ESE	1,011,323.00	-	-	1,011,323.00
5.3.365	DST/INSPIRE/000032/KALYAN KOLOY	34,682.00	1,648,132.00	1,323,649.00	359,165.00
5.3.366	DST/inspire Faculty/alik Sundar Mazumdar	-	1,025,552.00	617,307.00	408,245.00
5.3.367	DST/ Inspire Faculty/ Apurba Sinha Mahapatra	77,933.00	2,071,391.00	2,445,654.00	(296,330.00)
5.3.368	DST/ Inspire Faculty Award AGL/14	632,456.00	-	94,354.00	538,102.00
5.3.369	DST/INSPIRE FACULTY/DINESH SAWANT	521,303.00	103,697.00	625,000.00	-
5.3.370	DST.INSPIRE FACULTY/ SUKHENDU NANDY	392,504.00	2,258,163.00	1,728,929.00	921,738.00
5.3.371	DST/INSPIRE FACULTY WARD 2014/LSPA-25	230,868.00	2,621,803.00	1,446,537.00	1,406,134.00
5.3.372	DST/NM-ICPS/MGB/2018	-	70,000,000.00	-	70,000,000.00
5.3.373	DST(SERB)/678/FMME/2019-20	-	335,000.00	56,000.00	279,000.00
5.3.374	DST/SERB/700/AGL/19-20	-	3,200,000.00	-	3,200,000.00
5.3.375	EC(1)/2008-09/239/AGL	8,181.00	-	-	8,181.00
5.3.376	ECL/607/18-19/CE	93,260.00	-	47,411.00	45,849.00
5.3.377	ECL/674/ME/2019-20	-	1,106,250.00	3,053.00	1,103,197.00
5.3.378	GHRTC, ONGC & IIT(ISM)/615/18-19/PE	-	1,995,144.00	196,907.00	1,798,237.00
5.3.379	GSDP ENVIS CENTRE	479,310.00	3,174,000.00	2,455,133.00	1,198,177.00
5.3.380	GSI/623/2018-19/AGP	-	485,100.00	116,778.00	368,322.00
5.3.381	GTG/666/2019-20/INSTITUTE	-	3,215,000.00	377,494.00	2,837,506.00
5.3.382	HUDCO/436/CE/2015-16	21,831.00	231,813.00	49,045.00	204,599.00
5.3.383	ICFRE/605/2018-19/ESE	-	171,991.00	380.00	171,611.00
5.3.384	ICHR(I)/434/HSS/2015-16	84,120.00	-	-	84,120.00
5.3.385	ICMR/476/ESE/2016-17	43,600.00	528,178.00	520,308.00	51,470.00
5.3.386	ICPR/408/HSS	2,870.00	1,000.00	3,870.00	-
5.3.387	ICPR/451/15-16/HSS	58,370.00	-	20,718.00	37,652.00
5.3.388	ICSSR/355/13-14/MS	83.00	-	-	83.00
5.3.389	ICSSR/414/MS	703.00	-	-	703.00
5.3.390	ICSSR/560/HSS/2018-19	2,485.00	99,969.00	102,204.00	250.00
5.3.391	ICSSR/676/2019-20/HSS	-	240,000.00	-	240,000.00
5.3.392	IGC/610/AGL/2018-19	113,513.00	-	69,824.00	43,689.00
5.3.393	IGC/611/AGL	-	250,000.00	47,977.00	202,023.00
5.3.394	IGC/622/2018-19/AGL	-	150,000.00	106,669.00	43,331.00
5.3.395	IICP(I)/2007-2008/01/FME	573,106.00	-	-	573,106.00
5.3.396	IIOGPT, ONGC & IIT(ISM)/18-19/614/PE	-	8,575,656.00	560,155.00	8,015,501.00
5.3.397	IPEM/367/INST/2013-14	184,656.00	-	-	184,656.00
5.3.398	IPEM/399/INST/2014-15	82,582.00	-	-	82,582.00
5.3.399	IRS, ONGC & IIT(ISM) (2)/595/2018-19/PE	2,236,303.00	-	551,477.00	1,684,826.00
5.3.400	IRS, ONGC & IIT (ISM)/545/PE/17-18	930,730.00	7,068.00	721,830.00	215,968.00
5.3.401	ISRO/493/AGP/2016-17	37,443.00	681,000.00	498,197.00	220,246.00
5.3.402	ISRO/500/AGL/2016-17	78,666.00	700,000.00	484,336.00	294,330.00
5.3.403	ISRO/502/ME/2016-17	3,747.00	-	462,500.00	(458,753.00)
5.3.404	ISRO/513/ECE/2017-18	35,101.00	563,070.00	485,205.00	112,966.00
5.3.405	ISRO/515/APH/17-18	125,739.00	241,000.00	313,304.00	53,435.00
5.3.406	ISRO/538/ 2017-18/ECE	59,071.00	752,000.00	503,433.00	307,638.00
5.3.407	ISRO/541/AM/2017-18	69,941.00	556,000.00	571,108.00	54,833.00
5.3.408	ISRO/571/ECE/2018-19	261,735.00	746,000.00	385,742.00	621,993.00
5.3.409	JSEP/564/18-19/AGL	32,750.00	-	32,750.00	-
5.3.410	KRC/ESE/2014-15	131,957.00	36,615.00	139,072.00	29,500.00
5.3.411	MCIT/419/CSE	94,719.00	354,297.00	41,530.00	407,486.00
5.3.412	MCL/616/AGL/18-19	-	864,000.00	-	864,000.00
5.3.413	MDWS/453/ESE/2015-16	47,547.00	-	1,600.00	45,947.00
5.3.414	MHRD/402/INST/14-15	18,811,566.00	-	5,609,206.00	13,202,360.00
5.3.415	MHRD/438/15-16/ (FDC)/INST	1,430,815.00	5,286,036.00	4,112,782.00	2,604,069.00



5.3.416	MHRD/641/2019-20/CE	-	1,924,940.00	880,847.00	1,044,093.00
5.3.417	MHRD/651/19-20/CE	-	1,749,970.00	2,657.00	1,747,313.00
5.3.418	Misc Receipts - R&D	768,412.00	-	-	768,412.00
5.3.419	MIT/189/CSE	549.00	-	-	549.00
5.3.420	MOC/188	11,586.00	-	-	11,586.00
5.3.421	MOC/441/15-16/ME	5,783.00	23,292.00	21,500.00	7,575.00
5.3.422	MOC/449/CE/15-16	21,212,684.00	-	5,883,090.00	15,329,594.00
5.3.423	MOEF/443/ESE/2015-16	1,120,377.00	-	136,001.00	984,376.00
5.3.424	MOES/322/12-13/AGP	12,317.00	-	-	12,317.00
5.3.425	MOES/357/2013-14/AGP	257,092.00	-	158,092.00	99,000.00
5.3.426	MOES/407/2014-15/AGL	60,574.00	-	47,600.00	12,974.00
5.3.427	MOES/416/AGP	57,035.00	6,531.00	63,566.00	-
5.3.428	MOES/424/2015-16/AGL	337.00	28,249.00	28,852.00	(266.00)
5.3.429	MOES/425/2015-16/ME	297,252.00	-	296,797.00	455.00
5.3.430	MOES/426/2015-16/AGL	3,456,868.00	495,664.00	3,924,445.00	28,087.00
5.3.431	MoES/456/AGP/2015-16	63,330.00	530,000.00	436,941.00	156,389.00
5.3.432	MOES/543/2017-18/PE	2,585,858.00	715,209.00	3,012,373.00	288,694.00
5.3.433	MOES/566/AGL	3,447,791.00	39,506.00	2,811,842.00	675,455.00
5.3.434	MoES/584/AGP/18-19	6,370,246.00	74,320.00	548,090.00	5,896,476.00
5.3.435	MOES/625/CE	1,986,160.00	-	489,517.00	1,496,643.00
5.3.436	MOM/417/15-16/ME	221,624.00	-	186,178.00	35,446.00
5.3.437	MOM/450/2015-16/ME	549,075.00	114,960.00	330,268.00	333,767.00
5.3.438	MOM/537/ME/2017-18	435,480.00	350,000.00	592,967.00	192,513.00
5.3.439	MOM/618/2018-19/MME	1,395,710.00	-	617,667.00	778,043.00
5.3.440	MOT/548/2017-18/MS	10,056.00	447,566.00	454,024.00	3,598.00
5.3.441	MSME(1)/09-10/263/DRD/MS	82,500.00	-	-	82,500.00
5.3.442	MWR/184/MIN	97,072.00	-	-	97,072.00
5.3.443	MWR/308/ESE (3)/2012-13	495,817.00	-	-	495,817.00
5.3.444	NAMAMI GANGE A/C	371,449.00	-	-	371,449.00
5.3.445	NBHM/528/2017-18/AM	9,182.00	80,299.00	89,481.00	-
5.3.446	NHRC/586/HSS/18-19	88,000.00	88,000.00	174,568.00	1,432.00
5.3.447	NTPC/620/18-19/620/ECE	-	1,144,520.00	928,390.00	216,130.00
5.3.448	OCL/591/2018-19/CE	285,276.00	-	285,276.00	-
5.3.449	OIDB/4111	1,871,671.51	-	-	1,871,671.51
5.3.450	OIL/321/PE/12-13	147,940.00	-	127,269.00	20,671.00
5.3.451	OIL/377/2013-14/PE	196,305.00	-	-	196,305.00
5.3.452	OIL/428/PE/2016	572,920.00	-	55,771.00	517,149.00
5.3.453	ONGC VIDESH LTD.	26,346,177.00	10,393,677.00	966,823.00	35,773,031.00
5.3.454	OTHER PROJECT	14,635,016.13	-	-	14,635,016.13
5.3.455	PNB/558/2018-19/MS	204,220.00	55,380.00	160,469.00	99,131.00
5.3.456	Powergen/597/2018-19/CE	50,927.00	-	-	50,927.00
5.3.457	PTPP/704/FMME/19-20	-	168,000.00	-	168,000.00
5.3.458	RCPL/559/PE/2018-19	353,188.00	-	40,055.00	313,133.00
5.3.459	RCPL/660/2019-20/CIVIL ENGG.	-	200,000.00	200,000.00	-
5.3.460	RSC/613/AM/2018-19	407,869.48	-	370,822.00	37,047.48
5.3.461	Rungta /629/2018-19/ESE	508,474.00	491,526.00	75,875.00	924,125.00
5.3.462	SAC/183/AGP	4,425.00	-	-	4,425.00
5.3.463	SAIL/621/2018-19/ESE	-	228,900.00	-	228,900.00
5.3.464	SECL/592/2018-19/ESE	2,162,980.00	-	873,821.00	1,289,159.00
5.3.465	Tata Steel/519/2017-18	542,645.00	-	143,895.00	398,750.00
5.3.466	TATA STEEL/535/ESE	1,146.00	1,000,000.00	571,886.00	429,260.00
5.3.467	Tata Steel/675/2019-20/CE	-	906,780.00	131,956.00	774,824.00
5.3.468	TATA STEEL & IIT(ISM)/19-20/644/AC	-	1,100,000.00	443,500.00	656,500.00
5.3.469	Tata Steel & IIT (ISM) MOU/549/2017-18/INST	1,250,000.00	1,770.00	801,399.00	450,371.00
5.3.470	TATA Steel & IIT(ISM)/MOU/589/INST/18-19	324,364.00	967,000.00	705,692.00	585,672.00
5.3.471	Tata Steel & IIT(ISM)/mou/662/2019-20/AC	-	1,000,000.00	674,142.00	325,858.00
5.3.472	UGC/495/APH/2016-17	5,175.00	45,000.00	5,175.00	45,000.00
5.3.473	UGC/562/AGP	9,079,230.00	2,191,200.00	1,655,575.00	9,614,855.00
5.3.474	VEDANATA/598/ESE/2018-19	4,834.00	464,091.00	114,686.00	354,239.00
5.3.475	GIAN COURSE-2019 (G K VISHWAKARMA)	-	597500.00	597499.00	1.00
5.3.476	IUSSTF/552/2017-18/AC	-	1200000.00	499808.00	700,192.00
5.3.477	JSBCCL/668/2019-20/CE	-	99985.84	96597.00	3,388.84
5.3.478	L&T/679/CE/19-20	-	425000.00	17137.00	407,863.00
5.3.479	RCPL/673/2019-20/ME	-	330770.00	78623.00	252,147.00
5.3.480	SAIL/617/18-19/ESE	-	360000.00	321506.00	38,494.00
5.3.481	WBPDC (STPS)/648/2019-20/FME	-	505000.00	284735.00	220,265.00
5.3.482	WBPDC (STPS)/649/2019-20/FME	-	390000.00	230453.00	159,547.00
5.3.483	Sub-total	803,665,773.12	415,002,300.84	355,077,341.00	863,590,732.96



5.3.484	Seminar/Symposium/Conference	6,284,539.08	28,688,486.00	24,281,190.00	10,691,835.08
5.3.485	UGC Sponsored Projects				
5.3.486	JRF/SRF Fellowship (F.17-161/98(SA-1))	426,637.00	-	-	426,637.00
5.3.487	Spl. Assistance/CAS Programme	1,034,801.32	-	-	1,034,801.32
5.3.488	UGC/193/APPL. MATHS	3,700.00	-	-	3,700.00
5.3.489	UGC/195/APPL. MATHS	71,671.00	-	-	71,671.00
5.3.490	UGC/204/AM	7,653.00	-	-	7,653.00
5.3.491	UGC/205/PET ENGG.	480,781.00	-	-	480,781.00
5.3.492	UGC/214(43)/2008-09/AM	1,207,403.00	-	-	1,207,403.00
5.3.493	UGC/222/(34)/2008-09/MS	14,969.00	-	-	14,969.00
5.3.494	UGC/229(38)/2008-09/AM	546.00	-	-	546.00
5.3.495	UGC/255/AM	9,805.00	-	-	9,805.00
5.3.496	UGC/257/APPL. PHY	11,154.00	-	11,154.00	-
5.3.497	UGC/266/PE	500,000.00	-	-	500,000.00
5.3.498	UGC/277/APH	19,404.00	-	-	19,404.00
5.3.499	UGC/284/FME	1,000.00	-	-	1,000.00
5.3.500	UGC/285/AC	18,819.00	-	-	18,819.00
5.3.501	UGC/287/APH	499.00	-	-	499.00
5.3.502	UGC/288/10-11/ME&MME	19,450.00	-	-	19,450.00
5.3.503	UGC/289/HSS/10-11	110,412.00	-	-	110,412.00
5.3.504	UGC/292/AM	6.00	-	-	6.00
5.3.505	UGC-295/DCSR.APH	160.00	-	-	160.00
5.3.506	UGC/296/11-12/AGP	531,927.00	254,251.00	-	786,178.00
5.3.507	UGC/297/ECE	1,000.00	-	-	1,000.00
5.3.508	UGC/317/AGL/2012-13	165,091.00	-	-	165,091.00
5.3.509	UGC/330/MS	3,647.00	-	-	3,647.00
5.3.510	UGC/333/MS	75.00	-	-	75.00
5.3.511	UGC/334/PF	4.00	-	-	4.00
5.3.512	UGC/98/JRF/F.17-161	376,226.00	-	-	376,226.00
5.3.513	UGC/98/JRF/GYAN PRAKASH	56,500.00	-	-	56,500.00
5.3.514	UGC/CAS/ME Phase-II (Grants)	484,687.87	-	-	484,687.87
5.3.515	UGC/HEPSN-TEPSE	418,302.00	-	150,000.00	268,302.00
5.3.516	UGC Misc. Project	500,000.00	-	-	500,000.00
5.3.517	UGC/SAP/179/AGP/Phase-III	217,006.00	-	-	217,006.00
5.3.518	UGC/SAP/AGP Phase - II	190,112.00	-	-	190,112.00
5.3.519	UGC - Unassigned Grant	137,161.75	-	-	137,161.75
5.3.520	Sub-total	7,020,609.94	254,251.00	161,154.00	7,113,706.94
5.3.521	Sub-total	1,010,716,336.19	523,695,938.04	569,817,667.53	964,594,606.70

(C) Other Current Liabilities (Projects):

C	Particulars	Balance as on 01.04.2019	Additions during the year	Deduction/Adj during the year	Balance as on 31.03.2020
5.3.522	Hostels				
5.3.523	MESS FEE-Amber Hostel	13,442,755.00	33,840,185.00	47,282,940.00	-
5.3.524	MESS FEE-Diamond Hostel	4,601,284.00	4,309,624.00	8,910,908.00	-
5.3.525	MESS FEE-Emerald Hostel	3,709,528.00	6,772,257.00	10,481,785.00	-
5.3.526	MESS FEE-Jasper Hostel	21,956,542.00	29,153,918.00	51,110,460.00	-
5.3.527	MESS FEE-Opal Hostel	4,061,059.00	4,083,057.00	8,144,116.00	-
5.3.528	MESS FEE- Rosaline Hostel	0.00	45,000.00	-	45,000.00
5.3.529	MESS FEE-Ruby Hostel	14,385,648.00	9,946,887.00	24,332,535.00	-
5.3.530	MESS FEE-Sapphire Hostel	6,131,669.00	11,528,176.00	17,659,845.00	-
5.3.531	MESS FEE-Topaz Hostel	4,520,456.00	4,964,759.00	9,485,215.00	-
5.3.532	Central Research Facility	4,210,668.00	1250926.00	1199926.00	4,261,668.00
5.3.533	Earnest Money	166,750.00	-	-	166,750.00
5.3.534	SECURITY DEPOSIT	1,136,896.85	1,347,946.00	253,544.00	2,231,298.85
5.3.535	Outstanding Expenses(CSIR/327/ME/2012-13)	924,542.00	-	-	924,542.00
5.3.536	B E Course for Afghan Students -2014	24,068,380.00	-	1,203,250.00	22,865,130.00
5.3.537	Travel Grant	0.10	1,744,827.20	1,607,921.00	136,906.30
5.3.538	Best Research Award Fund	59,841.00	-	-	59,841.00
5.3.539	BRS LIABILITIES	835,600.49	-	-	835,600.49
5.3.540	CCL RANCHI	819,963.04	-	-	819,963.04
5.3.541	Centre of Societal Mission	0.00	211,637.00	211,637.00	-
5.3.542	Children Activity Centre	675.00	-	-	675.00
5.3.543	HEDP/M-TECH-AFGHAN/2018-20	2,247,468.00	2,498,822.00	717,059.00	4,029,231.00
5.3.544	ISM ALUMNI FUND	334,635.00	566,987.00	630,548.00	271,074.00
5.3.545	MAS-2019	0.00	587,000.00	458,916.00	128,084.00
5.3.546	MESS FEE (LIB)	490,764.00	183,336,502.00	107,286,173.00	76,541,093.00
5.3.547	Misc Receipts - Consultancy	1,458,110.45	-	-	1,458,110.45



5.3.548	Misc Receipts (Liabilities)	63,258,475.29	220,794,925.15	243,626,817.20	40,426,583.24
5.3.549	M Tech Course of Afghan Student S	572,029.00	-	-	572,029.00
5.3.550	NIT DURGAPUR	233,607.00	-	-	233,607.00
5.3.551	NTPC LTD,	49,000.00	-	-	49,000.00
5.3.552	PM RELIEF FUND	-	7,516.00	7,516.00	-
5.3.553	PM RELIEF FUND (KERALA), NMDC CHAIR	-	4,767.00	4,767.00	-
5.3.554	PM RELIEF FUND (RAJIV GANDHI CHAIR)	-	3,900.00	3,900.00	-
5.3.555	Loading & Boarding	-	16,200.00	-	16,200.00
5.3.556	SEMAD	-	23,000.00	23,000.00	-
5.3.557	SRIP-2020	-	12,000.00	-	12,000.00
5.3.558	WSCR-2019	-	7,500.00	7,500.00	-
5.3.559	RTEPDRR-2020	-	1,225,495.28	86,141.00	1,139,354.28
5.3.560	SME ISM STUDENT CHAPTER	-	490,000.00	490,000.00	-
5.3.561	Students of Societies	-	2,312,800.00	2,312,800.00	-
5.3.562	Sub-total	173,676,346.22	521,086,613.63	537,539,219.20	157,223,740.65
(D) Inter-Unit Liabilities (PROJECTS)					
C	Particulars	Balance as on 01.04.2019	Additions during the year	Deduction/Adj during the year	Balance as on 31.03.2020
5.3.563	Benevolent Fund	-	4,836,004.00	4,836,004.00	-
5.3.564	EDC Room Rent	-	5,565,080.00	5,565,080.00	-
5.3.565	ELECT CHARGE	-	71,398.00	71,398.00	-
5.3.566	Electric Charges for Rajiv Gandhi Chair	-	3,046.00	3,046.00	-
5.3.567	Electric Charges From NMDC CHAIR	-	6,805.00	6,805.00	-
5.3.568	Electric Charges of Mess Caterer	-	52,644.00	52,644.00	-
5.3.569	Hostel Room Rent	-	1,850.00	1,850.00	-
5.3.570	IIIF DELHI	-	4,000.00	4,000.00	-
5.3.571	Institute Development Fund	-	3,907,750.35	3,907,750.35	-
5.3.572	Institute Support Charges	-	49,645,939.83	49,645,939.83	-
5.3.573	ISM - IIIF - KOLKATA	-	14,000.00	14,000.00	-
5.3.574	Licence Fee From NMDC CHAIR	-	12,780.00	12,780.00	-
5.3.575	License Fee	-	23,922.00	23,922.00	-
5.3.576	Medical Charges	-	5,500.00	5,500.00	-
5.3.577	Medical Charges From NMDC Chair	-	6,000.00	6,000.00	-
5.3.578	Medical Charges From Rajiv Gandhi Chair	-	3,348.00	3,348.00	-
5.3.579	Non Plan Control A/c	(22,272,234.88)	86,833,909.06	4,566,841.00	59,994,833.18
5.3.580	N.Plan End. Fund (Surplus Payable)	86,773,371.92	81,443,616.53	52,440,308.88	115,776,679.57
5.3.581	P F Control A/c	-	105,000,000.00	105,000,000.00	-
5.3.582	SAH Room Rent	-	257,387.00	257,387.00	-
5.3.583	Scolomin Club	7,300.00	-	7,300.00	-
5.3.584	Scolomin Club for Rajeev Ghandhi Chair	-	400.00	400.00	-
5.3.585	VEHICLE CHARGES	-	25,957.00	25,957.00	-
5.3.586	VEHICLE CHARGES OF RAJIV GANDHI CHAIR	-	249.00	249.00	-
5.3.587	WATER CHARGES	-	8,476.00	8,476.00	-
5.3.588	Water Charges for NMDC Chair	-	2,246.00	2,246.00	-
5.3.589	Water Charges From Rajiv Gandhi Chair	-	503.00	503.00	-
5.3.590	Sub-total	64,508,437.04	337,732,810.77	226,469,735.06	175,771,512.75
(E) PROVISIONS (PROJECTS)					
C	Particulars	Balance as on 01.04.2019	Additions during the year	Deduction/Adj during the year	Balance as on 31.03.2020
5.3.591	Provisions for payment to CPWD	17,600,000.00	-	17,600,000.00	-
5.3.592	Sub-total	17,600,000.00	-	17,600,000.00	-
5.1'	Total Current Liabilities (Plan)	46,572,716.50	271,173,525.87	9,814,442.00	307,931,800.37
5.2'	Total Current Liabilities (Non Plan)	288,390,200.04	924,336,182.00	748,787,420.44	463,938,961.60
5.3'	Total Current Liabilities (Project)	1,263,047,416.75	1,441,341,835.44	1,417,870,825.79	1,286,518,426.40
5'	Total Current Liabilities	1,598,010,333.29	2,636,851,543.31	2,176,472,688.23	2,058,389,188.37



SCHEDULE - VI : FIXED ASSETS										
S No	Particulars	Balance as on 01.04.2019	Additions during the year	Deduction/Adj during the year	Gross Total as on 31.03.2020	Depreciation / Amortisation				Balance as on 31.3.2020
Plan:						Upto 2018-19	Dep. %	For 2019-20	Total Depreciation	
6.1.1	Tangible Assets:									
6.1.2	Land	14,662,250.00	-	-	14,662,250.00	-	0%	-	-	14,662,250.00
6.1.3	Roads & Buildings	2,636,579,697.00	302,764,882.00	-	2,939,344,579.00	605,825,350.08	2%	58,786,891.58	664,612,241.66	2,274,732,337.34
6.1.4	Tube Wells & Water Supply	376,006.00	1,076,762.00	-	1,452,768.00	13,739.28	2%	29,055.36	42,794.64	1,409,973.36
6.1.5	Electrical Installation & Equipment	160,380,355.00	19,474,529.00	-	179,854,884.00	61,176,842.08	5%	8,992,744.20	70,169,586.28	109,685,297.72
6.1.6	Scientific & Laboratory Equipment	923,497,189.19	113,305,710.00	-	1,036,802,899.19	567,355,253.65	8%	82,944,231.94	650,299,485.59	386,503,413.60
6.1.7	Office Automation	9,619,101.00	2,698,125.00	-	12,257,226.00	2,402,644.02	8%	980,578.08	3,383,222.10	8,874,003.90
6.1.8	Office Equipment	4,389,142.00	353,835.00	-	4,742,977.00	526,628.10	7.5%	355,723.28	882,351.38	3,860,625.63
6.1.9	Audio Visual Equipment	34,682,505.00	1,768,209.00	-	36,450,714.00	13,617,340.59	7.5%	2,733,803.55	16,351,144.14	20,099,569.86
6.1.10	Computers & Peripherals	274,126,053.00	7,208,442.00	-	281,334,495.00	233,110,515.40	20%	14,229,633.60	247,340,149.00	33,994,346.00
6.1.11	Furniture, Fixtures & Fittings	251,971,705.00	3,093,901.00	-	255,065,606.00	93,919,685.50	7.5%	19,129,920.45	113,049,605.95	142,016,000.05
6.1.12	Vehicles	15,612,413.00	-	-	15,612,413.00	11,225,380.70	10%	1,561,241.30	12,786,622.00	2,825,791.00
6.1.13	Library Books & Scientific Journals	424,397,552.00	553,238.00	-	424,950,790.00	387,313,309.30	10%	4,674,967.20	391,988,276.50	32,962,513.50
6.1.14	Intangible Assets:									
6.1.15	E - Journals	135,771,029.00	53,319,775.00	-	189,090,804.00	99,731,821.60	40%	47,456,301.00	147,188,122.60	41,902,681.40
6.1.16	Computer Software	48,398,287.00	9,115,085.00	-	57,453,372.00	38,617,591.60	40%	10,424,958.00	49,042,549.60	8,410,822.40
6.1.17	Capital Work In Progress:									
6.1.18	WIP - Road & Buildings	5,319,702,107.00	436,452,000.00	-	5,477,320,230.00	-	-	-	-	5,477,320,230.00
6.1.19	WIP - Furniture & Fixtures	0.00	-	-	-	-	-	-	-	-
6.1.20	WIP - Power & Augmentation	17,856,000.00	-	-	17,856,000.00	-	-	-	-	17,856,000.00
6.1.21	Total - Current year (Plan)	10,271,961,391.19	951,124,493.00	278,833,877.00	10,944,252,007.19	2,114,836,100.17	-	252,300,049.53	2,367,136,151.42	8,577,115,857.49



S No	Particulars	Balance as on 01.04.2019	Additions during the year	Deduction/Adj during the year	Gross Total as on 31.03.2020	Depreciation / Amortisation			Balance as on 31.3.2020	
						Upto 2018-19	Dep. %	For 2019-20		Total Depreciation
Non Plan:										
6.2.1	Tangible Assets:									
6.2.2	Roads & Buildings (On Freehold Land):	9,769,200.00	-	-	9,769,200.00	6,488,929.63	2%	195,384.00	6,684,313.63	3,084,886.37
6.2.3	Building including Gen set at NBCC Kolkata - Endowment Fund	157,567,849.00	10,534,655.00	-	168,102,504.00	18,454,739.92	2%	3,362,050.08	21,816,790.00	146,285,714.00
6.2.4	Building including Gen set at NBCC N Delhi - Endowment Fund	350,321,003.00	-	-	350,321,003.00	21,019,260.18	2%	7,006,420.06	28,025,680.24	322,295,322.76
6.2.5	Tubewells & Water Supply	1,801,135.00	16,640.00	-	1,817,775.00	1,009,409.59	2%	36,355.50	1,045,765.09	772,009.91
6.2.6	Electrical Installation & Equipment	4,052,982.00	49,800.00	-	4,102,782.00	2,908,946.50	5%	205,138.10	3,114,084.60	988,677.40
6.2.7	Scientific & Laboratory Equipment	14,328,109.00	76,103.00	-	14,404,212.00	14,196,948.20	8%	17,493.44	14,214,441.64	189,770.36
6.2.8	Office Equipment	18,224,377.00	14,970.00	-	18,239,347.00	12,779,974.75	7.5%	1,367,951.03	14,147,925.78	4,091,421.22
6.2.9	Audio Visual Equipment	11,688,201.00	-	-	11,688,201.00	8,323,101.44	7.5%	876,615.08	9,199,716.51	2,488,484.49
6.2.10	Computers & Peripherals	12,380,935.00	1,333,983.00	-	13,714,918.00	6,896,687.60	20%	1,669,970.40	8,606,668.00	5,108,250.00
6.2.11	Furniture, Fixtures & Fittings	14,585,735.00	19,224.00	-	14,604,959.00	14,362,932.85	7.5%	21,100.73	14,384,033.57	220,925.43
6.2.12	Student Hostel furniture	1,444,548.00	-	-	1,444,548.00	1,165,380.57	7.5%	108,341.10	1,273,721.67	170,826.33
6.2.13	Vehicles	551,432.00	-	-	551,432.00	551,431.00	10%	-	551,431.00	1.00
6.2.14	Library Books & Scientific Journals	36,844,775.00	172,226.00	-	37,017,001.00	36,844,774.00	10%	17,222.60	36,861,996.60	155,004.40
6.2.15	Intangible Assets:									
6.2.16	Computer Software	1,768,908.00	71,357.00	-	1,840,265.00	1,678,437.80	40%	88,855.60	1,767,293.40	72,971.60
6.2.17	Capital Work In Progress	500,000,000.00	645,000,000.00	-	1,145,000,000.00	-	-	-	-	1,145,000,000.00
6.2.18	Total - Current year (Non Plan)	1,135,329,169.00	657,288,958.00	0.00	1,792,618,127.00	146,720,955.38		14,972,897.71	161,693,853.08	1,630,924,273.91
6.2.19	Total (Plan & Non Plan)	11,407,290,560.19	1,608,413,451.00	278,833,877.00	12,736,870,134.19	2,261,557,055.55	0.00	267,272,947.24	2,528,830,004.50	10,208,040,131.40



(21)

SI No	Particulars	Balance as on 01.04.2019	Additions during the year	Deduction/Adj during the year	Gross Total as on 31.03.2020	Depreciation				
Project:						Upto 2018-19	Dep. %	For 2019-20	Total Depreciation	Closing Balance as on 31.3.2020
6.3.1	Tangible Assets:									
6.3.2	Roads & Buildings (On Freehold Land)	40,220,146.06	23,539,569.00	-	63,759,715.06	29,980,014.72	2%	1,275,194.30	31,255,209.02	32,504,506.04
6.3.3	Electrical Installation	1,058,380.00	1,310,366.00	-	2,368,746.00	79,382.50	5%	118,437.30	197,819.80	2,170,926.20
6.3.4	Scientific & Laboratory Equipment	486,065,185.27	118,535,004.00	-	604,600,189.27	269,257,855.09	8%	48,368,015.14	317,625,870.23	286,974,319.04
6.3.5	Office Equipment	13,842,222.00	3,458,050.00	-	17,300,272.00	3,522,566.75	7.5%	1,297,520.40	4,820,087.15	12,480,184.85
6.3.6	Audio Visual Equipment	1,085,749.00	343,229.00	-	1,428,978.00	122,279.18	7.5%	107,173.35	229,452.53	1,199,525.47
6.3.7	Computers, Peripherals & Internet Equipment	57,827,711.40	9,923,866.00	-	67,751,577.40	44,142,834.20	20%	5,812,130.40	49,954,964.60	17,796,612.80
6.3.8	Furniture & Fixtures	9,736,073.00	2,264,473.00	-	12,000,546.00	3,070,006.57	7.5%	900,040.95	3,970,047.52	8,030,498.48
6.3.9	Vehicles	1,043,602.00	150,000.00	-	1,193,602.00	1,043,601.00	10%	15,000.00	1,058,601.00	135,001.00
6.3.10	Books and Journals	11,226,159.00	301,981.00	-	11,528,140.00	10,405,581.30	10%	422,391.00	10,827,972.30	700,167.70
6.3.11	Intangible Assets:									
6.3.12	Computer Software	42,715,259.00	8,000,823.00	-	50,716,082.00	36,714,200.20	40%	8,139,563.60	44,853,763.80	5,862,318.20
6.3.13	Current year (Project)	664,820,486.73	167,827,361.00	-	832,647,847.73	398,338,321.51		66,455,466.44	464,793,787.95	367,854,059.78
6.00	TOTAL - Current year	12,072,111,046.92	1,776,240,812.00	278,833,877.00	13,569,517,981.92	2,659,895,377.06		333,728,413.68	2,993,623,792.46	10,575,894,191.17
* Depreciation has been calculated as per prescribed rates (Details are explained under Notes on Accounts)										10,575,894,191.17

SCHEDULE VII : INVESTMENTS FROM EARMARKED/ENDOWMENT FUNDS

S No.		2019-20		2018-19		(Amount in Rs)
		Non-Plan	Plan	Non-Plan	Plan	
7.1	In Central Government Securities	-	-	-	-	-
7.2	In State Government Securities	-	-	-	-	-
7.3	Other Approved Securities	-	-	-	-	-
7.4	Shares	-	-	-	-	-
7.5	Debentures & Bonds	-	-	-	-	-
7.6	Term Deposits With Banks	372,314,293.00	-	446,450,553.00	-	188,334,853.00
7.7	Others:					
	(I) Fixed Deposits with NBFC					
	(a) LIC-HFL	100,000,000.00	-	-	-	-
	(b) PNB-HFL	101,116,921.00	-	-	-	-
	Sub-Total	573,431,214.00	-	446,450,553.00	-	188,334,853.00
	Interest Accrued on investments	28,955,521.93	-	10,443,765.75	-	11,731,043.33
7.8		602,386,735.93	-	474,653,296.00	-	200,065,896.33
7.9	TOTAL	602,386,735.93	-	474,653,296.00	-	200,065,896.33

SCHEDULE VII (A) : INVESTMENTS FROM EARMARKED/ENDOWMENT FUNDS (Fund Wise)

S No.	Funds	2019-20		2018-19		(Amount in Rs)
		Non-Plan	Plan	Non-Plan	Plan	
	Endowment Fund					
7.10	Investments	588,926,181.78	-	461,392,085.00	-	-
7.11	Scholarship & Award Fund	13,460,554.15	-	13,261,211.00	-	5,149,860.00
7.12	Chair Fund Investments	-	-	-	-	194,916,036.33
	Sub-Total	602,386,735.93	-	474,653,296.00	-	200,065,896.33
	TOTAL	602,386,735.93	-	474,653,296.00	-	200,065,896.33

SCHEDULE VIII : INVESTMENTS - OTHERS

S No.		2019-20		2018-19		(Amount in Rs)
		Non-Plan	Plan	Non-Plan	Plan	
8.1	In Central Government Securities	-	-	-	-	-
8.2	In State Government Securities	-	-	-	-	-
8.3	Other Approved Securities	-	-	-	-	-
8.4	Shares	-	-	-	-	-
8.5	Debentures & Bonds	-	-	-	-	-
8.6	Term Deposits With Banks	975,942,036.00	197,612,017.27	538,603,284.00	112,279,324.00	1,430,561,291.11
8.7	Others	-	-	-	-	-
	TOTAL	975,942,036.00	197,612,017.27	538,603,284.00	112,279,324.00	1,430,561,291.11



SCH.- IX : CURRENT ASSETS, LOANS, ADVANCES, ETC.					
IX (A) - Cash and Bank Balances :					
9.1 Plan:					
	Particulars	2019-20	2019-20	2018-19	2018-19
9.1.1	Cash at Bank :				
9.1.2	Plan SBI, Saving Bank Account	5,053,786.36		15,710,111.76	
9.1.3	SBI, ISM Campus Br, Dhn (Plan C/A)	1,890,235.75	6,944,022.11	1,857,241.75	
	Sub Total (Plan)		6,944,022.11		17,567,353.51
9.2 Non-Plan:					
9.2.1	Bank Bal. with Scheduled Banks :				
9.2.2	SBI, ISM Campus Br, Dhn (N Plan C/A)	1,929,486.00		2,383,954.00	
9.2.3	Non Plan SBI Saving Bank A/c	80,319,059.99		87,826,361.43	
9.2.4	Canara Bank, SDL Br., Dhanbad	28,953.00		28,953.00	
9.2.5	Canara Bank, Parlmt. St. Br., N.Delhi	9,537.00		9,537.00	
9.2.6	SBI, ISM,Dhanbad (Endow Fund SB A/c)	29,662.59		2,283,607.71	
9.2.7	SBI Online Fee A/c 7697 (S/B A/c)	0.17		-	
9.2.8	SBI Online Fee A/c 8197 (Current A/c)	20,710.60		61,651.00	
9.2.9	SBI Power Jyoti online	-		-	
9.2.10	E-payment SBI Bank Account	492,477.10		1,063,775.10	
9.2.11	Escrow A/c No 3 (Canara Bank SDL Br)	-		-	
9.2.12	Sub Total (Non Plan)	82,829,886.45	82,829,886.45	93,657,839.24	93,657,839.24
9.2.13	Cash in Hand	54,108.20	54,108.20	12,157.20	12,157.20
	Total Cash & Bank Balances (Non Plan)	82,883,994.65	82,883,994.65	93,669,996.44	93,669,996.44
9.3 Project:					
9.3.1	Balance with Scheduled Banks:				
9.3.2	Bank of India, ISM Branch, SB A/c	63,018.00		63,018.00	
9.3.3	Canara Bank Sandvik Chair A/ C	1,692,245.00		1,394,273.00	
9.3.4	Canara Bank DST -SERB Bank Account	600,000.00		-	
9.3.5	CanBank, SDL Br., Dh. - S.B. A/c	37,665,144.14		20,353,847.25	
9.3.6	CIL Chair, Canara Bank A/c	1,925,127.44		1,134,696.44	
9.3.7	ISMAANA CANARA BANK S B A/C	502,988.00		226,699.00	
9.3.8	MOLE CHAIR SB A/C CANARA BANK	2,636,235.00		1,752,930.00	
9.3.9	NMDC Chair in Open Cast, Canara Bank A/c	373,711.50		244,153.50	
9.3.10	ONGC AMN Ghosh Chair , Canara Bank A/c	2,112,183.58		1,378,798.58	
9.3.11	Rajiv Gandhi Chair, Canara Bank A/c	1,439,841.83		181,628.83	
9.3.12	Sail NMDC Chair, Canara Bank A/c	4,925,479.48		2,993,994.48	
9.3.13	SBI, ISM Br., Dhn.- Current A/c	229,648.03		229,648.03	
9.3.14	Special Fund A/c (Canara Bank) SDL Br	13,070,844.98		656,490.00	
9.3.15	TATA Steel Chair, Canara Bank A/c	3,695,886.50		1,160,550.50	
9.3.16	Uranium Chair Canara Bank A/c	420,124.00		406,036.00	
9.3.17	Sub Total (Project)	71,352,477.48	71,352,477.48	32,176,763.61	32,176,763.61
9.3.18	Cash Balance in hand	350,000.00	350,000.00	-	-
9.3.19	Total Cash & Bank Balances (Project)	71,702,477.48	71,702,477.48	61,361,176.09	32,176,763.61
	Total Cash & Bank Balances		161,530,494.24		143,414,113.56
IX (B) : INVESTMENTS					
Sl No	PARTICULARS	Balance as on 01.04.2019	Investments/ Renewals during the year	Investments Encashed/ adj. during the year	Balance as on 31.03.2020
Plan:					
7.1.5	Bank Fixed Deposits	50,000,000.00	62,411,010.00	50,000,000.00	62,411,010.00
7.1.6	Fixed Deposit with SBI	45,000,000.00	1,000,000,000.00	915,000,000.00	130,000,000.00
7.1.7	Accrued Interest	17,279,324.00	5,201,007.27	17,279,324.00	5,201,007.27
7.1.8	Sub-total - Plan	112,279,324.00	1,067,612,017.27	982,279,324.00	197,612,017.27
Non-Plan:					
7.2.15	8% GOI Bond (End. Fund Invest.)	-	-	-	-
7.2.16	Accrued Interest on End Fund FDRs	26,426,580.00	28,311,812.78	26,426,580.00	28,311,812.78
7.2.17	Accrued Interest on NP Investments	6,759,909.00	18,026,054.00	6,759,909.00	18,026,054.00
7.2.18	Endowment fund: SBI ISM FDs	215,083,210.00	261,497,448.00	305,083,210.00	171,497,448.00
7.2.19	Endowment Fund FD with CBI Bartand	51,200,000.00	-	51,200,000.00	-



7.2.20	ENDOWMENT FUND FD - CBI, BANK MORE	-	-	-	-
7.2.21	Endowment Fund FD - SBI, SME Branch	35,000,000.00	-	-	35,000,000.00
7.2.22	Endowment Fund FD - Canara Bank SDL Br	133,682,295.00	75,000,000.00	133,682,295.00	75,000,000.00
7.2.23	Endowment Fund FD - Indian Bank	-	78,000,000.00	-	78,000,000.00
7.2.24	Endowment Fund FD - LIC HFL	-	100,000,000.00	-	100,000,000.00
7.2.25	Endowment Fund FD - PNB HFL	-	101,116,921.00	-	101,116,921.00
7.2.26	FD with SBI Main Br Dhanbad	1,543,320.00	1,926,402.00	1,543,320.00	1,926,402.00
7.2.27	GIA & School income: SBI ISM FDs	527,500,000.00	2,137,668,208.00	1,855,000,000.00	810,168,208.00
7.2.28	GIA & School income: Canara Bank FDs	2,800,055.00	281,693,410.00	138,672,093.00	145,821,372.00
7.2.29	Scholarship funds: Bank FDs	13,261,211.00	10,691,845.00	9,360,048.00	13,460,554.15
7.2.30	Sub-total - Non Plan	1,013,256,580.00	3,093,932,100.78	2,527,727,455.00	1,578,328,771.93
Projects:					
7.3.20	Accrued Interest	135,649,283.91	110,491,617.77	135,649,283.91	110,491,617.77
7.3.21	Bank FDs & GOI Bonds(Project common Fund)	1,306,643,050.53	1,602,254,506.00	1,578,262,510.53	1,330,635,046.00
7.3.22	General Maintenance Fund: Bank FDs	-	30,000,000.00	-	30,000,000.00
7.3.23	Scholarship funds: Bank FDs	4,929,939.00	904,451.00	788,793.00	5,045,597.00
7.3.24	Chair Fund Investments:Bank FDs	183,404,914.00	26,652,347.00	21,555,961.00	188,501,300.00
7.3.25	Sub-total - Projects	1,630,627,187.44	1,770,302,921.77	1,736,256,548.44	1,664,673,560.77
7.3.26	GRAND TOTAL INVESTMENTS	2,756,163,091.44	5,931,847,039.82	5,246,263,327.44	3,440,614,349.97

IX (B) - LOANS, ADVANCES & OTHER CURRENT ASSETS:

(a) Loans/Advances to employees:

1. Plan:

SI No	PARTICULARS	Balance as on 01.04.2019	Additions during the year	Deduction/Adj during the year	Balance as on 31.03.2020
9.1.4	House Building Advance	59,235.00	-	59,235.00	-
9.1.5	Staff Advance	4,966.00	-	4,966.00	-
	Sub-total (Plan)	64,201.00	-	64,201.00	-

2. Non-Plan:

9.2.14	Cycle Advance	-	-	-	-
9.2.15	Car Advance	259,000.00	14,000.00	142,000.00	131,000.00
9.2.16	Festival Advance	19,924.00	-	-	19,924.00
9.2.17	H.B. Advance (Against Rev.Fund)	10,600.00	-	-	10,600.00
9.2.18	House Building Advance	23,002,408.00	14,632,384.00	11,849,234.00	25,785,558.00
9.2.19	Imprest Advances	97,092.00	1,419,437.00	1,320,481.00	196,048.00
9.2.20	PC Advance	294,800.00	643,295.00	457,295.00	480,800.00
9.2.21	Scooler/Motorcycle Advance	73,500.00	44,500.00	83,500.00	34,500.00
9.2.22	Staff Advance	283,515.00	12,550,435.00	11,048,376.00	1,821,574.00
	Sub-total (Non Plan)	24,040,839.00	29,304,051.00	24,900,886.00	28,480,004.00

3. Project

9.3.20	Staff Advance	735,385.02	2,663,219.00	1,553,320.00	1,845,284.02
9.3.21	Sub-total (Project)	735,385.02	2,663,219.00	1,553,320.00	1,845,284.02

(b) WIP / Advances / Prepaid Expenses

1. Plan:

9.1.6	Adv to Contractors	-	-	-	-
9.1.7	Advance To CPWD	-	186,500,000.00	-	186,500,000.00
9.1.8	Advance of books and Journals	5,779.00	-	-	5,779.00
9.1.9	Advances to suppliers	9,051,648.00	89,465,595.00	12,187,352.00	86,329,891.00
9.1.10	Prepaid Expenses	3,673,688.00	-	3,673,688.00	-
9.1.11	Sub-total	12,731,115.00	275,965,595.00	15,861,040.00	272,835,670.00

2. Non Plan:

9.2.23	Advances to suppliers	13,943,895.00	2,402,251.00	11,319,282.00	5,026,864.00
9.2.24	Prepaid Expenses	7,155,980.00	-	3,180,436.00	3,975,544.00
9.2.25	Sub-total	21,099,875.00	2,402,251.00	14,499,718.00	9,002,408.00

3. Project:

9.3.22	Advance to suppliers	3,754,580.62	12,438,258.00	3,022,904.00	13,169,934.62
9.3.23	Loan to Non Plan for Salary	30,168,074.00	-	30,168,074.00	-
9.3.24	Sub-total	33,922,654.62	12,438,258.00	33,190,978.00	13,169,934.62

(c) - Other Deposits / Receivables

1. Plan:

		Balance as on 01.04.2019	Additions during the year	Deduction/Adj during the year	Balance as on 31.03.2020
9.1.12	Damodar Valley Corporation	49,834,247.00	-	-	49,834,247.00
9.1.13	Namami Gange - Receivable	500,000.00	-	-	500,000.00
9.1.14	Non Plan Control Account	-	-	-	-



9.1.15	SD with DVC	50,000.00	-	-	50,000.00
9.1.16	SD with IOC/Mahavir Gas, Dhanbad	-	-	-	-
9.1.17	SD with JSEB	4,830,318.00	-	-	4,830,318.00
9.1.18	Sub-total	55,214,565.00	-	-	55,214,565.00
2. Non Plan:		Balance as on 01.04.2019	Additions during the year	Deduction/Adj during the year	Balance as on 31.03.2020
9.2.26	Plan Control Account	(435,256.00)	630,679.00	66,401.00	129,022.00
9.2.27	Plan Control Account(End Fund)	15,120,148.00	18,626,349.27	435,256.00	33,311,241.27
9.2.28	Project Control Account (End Fund)	86,773,371.92	81,443,616.53	52,440,308.88	115,776,679.57
9.2.29	Project Control Account (General)	(22,272,234.88)	86,833,909.06	4,566,841.00	59,994,833.18
9.2.30	Rent Receivable	-	-	-	-
9.2.31	GIA Receivable from GOI, MHRD	-	14,901,000.00	-	14,901,000.00
9.2.32	SD with Sunita Rani Marwaha	28,500.00	-	-	28,500.00
9.2.33	SD with BSNL, Dh.	67,500.00	-	-	67,500.00
9.2.34	SD with JSEB	5,803,481.00	-	-	5,803,481.00
9.2.35	TDS Receivable	25,000.00	192,854.00	149,564.00	68,290.00
9.2.36	Sub-total	85,110,510.04	202,628,407.86	57,658,370.88	230,080,547.02
3. Project:					
9.3.25	Consultancy Receivable	2,377,952.00	-	9,152.00	2,368,800.00
9.3.26	GST receivable on supplies to SEZ	51,382.00	-	-	51,382.00
9.3.27	Input IGST A/c	864,630.00	1,678,352.00	-	2,542,982.00
9.3.28	Security Deposit with Samanta & Co	12,000.00	-	-	12,000.00
9.3.29	Plan Control Account	(249,929.00)	15,346,556.00	15,346,556.00	(249,929.00)
9.3.30	GST TDS Receivable	-	222,186.00	-	222,186.00
9.3.31	PEMS Engineering Consultants Pvt. Ltd.	-	500,000.00	1,239,000.00	(739,000.00)
9.3.32	TEQIP III Control A/c	70,000.00	168,858.00	130,674.00	108,184.00
9.3.33	Income TDS Receivable	164,964.00	768,112.00	-	933,076.00
9.3.34	Sub-total	3,290,999.00	18,684,064.00	16,725,382.00	5,249,681.00
Total (Loans & Advances)		37,949,038.64	33,785,541.00	51,469,680.00	20,264,899.64
Total Loan, Advances & Deposits					
9.1	Total (Loan, Advances & Deposits) - PLAN	85,577,234.51			334,994,257.11
9.2	Total (Loan, Advances & Deposits) - NON-PLAN	223,921,220.48			350,446,953.67
9.3	Total (Loan, Advances & Deposits) - PROJECT	70,125,802.25			91,967,377.12
9	Total Current Assets	379,624,257.24			777,408,587.90



SCHEDULES TO INCOME & EXPENDITURE ACCOUNT AS ON 31.03.2020

SCHEDULE. X - GRANTS IN AID				
Sl.No.	Particulars	Current Year : 2019-20		Previous Year : 2018-19
10.01	Grants-in-aid from MHRD (Plan)	990,000,000.00		700,000,000.00
10.02	Add: GIA Receivable for the year	-		-
10.03	Total	990,000,000.00		700,000,000.00
10.04	Less: Transferred to Capital Fund towards non recurring expenses	748,973,772.40		700,000,000.00
10.05	Less: Transferred to Unutilised Grants towards advance to CPWD	186,500,000.00		-
10.06	Less: Unspent GIA transferred to Unutilised Grants	54,526,227.60		-
10.07	Grants-in-aid from MHRD (Non-Plan)	2,085,031,061.00		1,680,000,000.00
10.08	Add: GIA Receivable for the year	14,901,000.00		-
10.09	Total	2,099,932,061.00		1,680,000,000.00
10.10	Less: Transferred to Capital Fund towards non recurring expenses	1,577,566.00	2,098,354,495.00	-
	Grants in Aid	3,089,932,061.00	2,098,354,495.00	1,680,000,000.00

SCH.- XI - ACADEMIC RECEIPTS:				
Non-Plan:		Current Year : 2019-20		Previous Year : 2018-19
11.01	Admission Fee of Kolkata Ext Centre (M Tech)	207,163.00		81,078.00
11.02	Admission Fees	851,500.00		1,251,000.00
11.03	Annual Fees	5,856,000.00		6,422,600.00
11.04	Computer & Internet Fee	11,649,700.00		12,306,500.00
11.05	Convocation Receipts	1,189,200.00		2,028,600.00
11.06	DEGREE CERTIFICATE	647,600.62		624,809.00
11.07	Electric Charges (Students)	9,997,477.00		7,786,200.00
11.08	Entrance Exam. Fees	-		4,796,801.20
11.09	EXAM FEE	11,707,600.00		13,232,700.00
11.10	Fine/Penalty From Students	1,423,034.03		2,255,594.00
11.11	Hostel Admission Fees	862,000.00		997,600.00
11.12	Hostel & Mess Management Fee	3,237,650.00		3,709,900.00
11.13	Hostel Seat Rent	24,040,178.00		26,130,950.00
11.14	Hostel Seat Rent (Outside Students)	-		37,300.00
11.15	Identity Card	266,300.00		279,100.00
11.16	International EDC Annxe Lodgin Fee	1,935.00		249,705.00
11.17	International Hostel Seat Rent	427,955.00		37,917.00
11.18	Library Fees	8,853,387.00		10,251,946.00
11.19	License Fees (Students)	2,695.00		-
11.20	Marksheet Fees	132,850.00		118,400.00
11.21	Medical Fees From Students	203,630.00		428,979.00
11.22	Migration Certificate	1,151,850.00		1,405,800.00
11.23	Online Courses	118,000.00		-
11.24	Outsider Students Training Fee	177,500.00		244,750.00
11.25	Registration Fee	2,469,100.00		2,720,750.00
11.26	School Development Fees	3,120,000.00		3,026,000.00
11.27	Semester Rule Book Fee	335,400.00		1,652,300.00
11.28	Sports Fee	2,249,300.00		2,352,200.00
11.29	Student Activity Centre Fee	517,200.00		1,040,500.00
11.30	Student Activity Fees	-		7,466,600.00
11.31	Students Other Fees	1,863,991.51		702,750.70
11.32	Student Summer Training	6,000.00		-
11.33	THESIS EVALUATION FEE	1,540,000.00		1,460,000.00
11.34	Training & Placement Support Fee	10,748,875.00		11,409,800.00
11.35	Transcript Fee	1,411,220.00		1,140,469.00
11.36	Tuition Fees	428,555,877.00		395,427,112.00
11.37	Water Charges from students	1,993,580.00		-
11.38	TOTAL		537,815,748.16	523,076,710.90



SCH. - XII: INTEREST EARNED		Current Year : 2019-20		Previous Year : 2018-19	
Plan:					
Interest from Bank					
12.01.01	Interest on FDRs	18,626,349.27		29,640,648.00	
12.01.02	Less: Transfer to Non Plan Endowment	18,626,349.27	-	29,640,648.00	-
12.01.03	Interest on Plan S/B Bank Account	281,797.00		499,208.00	
12.01.04	Miscellaneous Income	-	281,797.00	-	499,208.00
	Sub Total (Plan)		281,797.00		499,208.00
Non Plan:					
A. Interest from Bank					
12.02.01	Interest on Endowment Fund	37,057,171.78		26,571,423.00	
12.02.02	Interest from FDRs	52,089,519.00		43,160,427.00	
12.02.03	Less : Transfer to End Fund	89,146,690.78		61,918,838.00	
12.02.04	Less: Transfer to other funds/adjustments	-	-	7,813,012.00	-
12.02.05	Interest on Non Plan SB Bank A/c	472,913.00		743,824.82	
12.02.06	Interest on Online Fee Collect SB A/c	420,822.00	893,735.00	573,574.00	1,317,398.82
12.02.07	Total Interest Income		893,735.00		1,317,398.82
B. Interest from employees:					
12.02.08	(a) Interest from HBA to Employees	1,712,787.00		336,540.00	
12.02.09	(b) Less: Transfer to HBA	-	1,712,787.00	18,539.00	318,001.00
12.02.10	Interest on Other Adv. to Employees	2,948.00		27,619.00	
12.02.11	Interest on LTC Advance	2,457.00		138.00	
12.02.12	Interest on PC Advance	154,014.00		168,167.00	
12.02.13	Interest from Scooter Advance	36,925.00		66,785.00	
12.02.14	Interest from Car Advance	36,000.00	232,344.00	4,000.00	266,709.00
	Sub Total (Non Plan)		2,838,866.00		1,902,108.82
Project:					
Interest from Bank					
12.03.01	Interest on Investment	80,654,956.43		85,924,691.80	
12.03.02	Interest on S.B. A/cs	792,147.00		941,442.00	
12.03.03	Interest on Staff Advance	757.00	81,447,860.43	-	86,866,133.80
12.03.04	Sub total (Project)		81,447,860.43		86,866,133.80
12.01	INTEREST INCOME - PLAN		281,797.00		499,208.00
12.02	INTEREST INCOME - NON PLAN		2,838,866.00		1,902,108.82
12.03	INTEREST INCOME - PROJECT		81,447,860.43		86,866,133.80
12	TOTAL - INTEREST INCOME		84,568,523.43		89,267,450.62



SCH. - XIII: OTHER INCOME				
Plan:				
A. Income from others:				
13.1.1	Penalty from Contractors/Suppliers	106,612.00		
13.1.2	Sub Total (Other Income)		106,612.00	-
Non-Plan:				
A. Recoveries from employees:				
13.2.1	Bus fare / vehicle charges	737,786.00		395,795.00
13.2.2	Electricity charges	4,553,963.00		4,609,875.00
13.2.3	License fees	2,811,461.00		3,285,086.00
13.2.4	Medical charges	2,844,425.00		2,977,790.00
13.2.5	Water charges	993,044.00		3,860.00
13.2.6	Personal Pay	288,200.00	12,228,879.00	-
				11,272,406.00
B. Income from others:				
13.2.7	Application fees for employment	2,243,300.00		99,500.00
13.2.8	CRF Analysis Charges	17,700.00		316,750.00
13.2.9	EDC room rent	8,911,516.88		10,333,557.04
13.2.10	Electric charges from tenants	6,238,796.20		2,456,679.00
13.2.11	GJLT/Penman Rent	75,416.00		201,134.00
13.2.12	Income from BRS	-		26,500.00
13.2.13	Interest on I.T. Refund	319,750.00		-
13.2.14	ISM IIIF Delhi Accomodation	33,500.00		253,000.00
13.2.15	ISM IIIF Kolkata Accomodation	300,500.00		425,700.00
13.2.16	License fees from tenants	1,362,636.00		1,045,870.00
13.2.17	Miscellaneous income	92,253.00		357,986.60
13.2.18	Sr. Acad. Hostel Room Rent	2,649,724.20		2,067,108.88
13.2.19	Tender Cost	22,453.00		864,384.00
13.2.20	Water charges	11,369.00		-
13.2.21	Cleaning Charges	44,000.00		-
13.2.22	Medical charges from Others	2,766.00		-
13.2.23	Penalty from Contractors/Suppliers	12,500.00		-
13.2.24	Prior Period Income	27,030.00	22,365,210.28	-
	Sub Total (Other Income)		34,594,089.28	29,720,575.52
C. Income from Consultancy/Projects:				
13.3.25	School share from Consultancy			-
13.3.26	School support from Consultancy/ Projects	57,826,332.83		47,093,606.12
	Sub Total (Income form Projects)		57,826,332.83	47,093,606.12
13	Total School Income (N Plan)		92,420,422.11	76,814,181.64



SCH. XIV - ESTABLISHMENT EXPENSES		Current Year : 2019-20		Previous Year : 2018-19	
14.1	Plan:				
14.1.1	Pay & Allowances	-	-	-	-
14.2	Non-Plan:				
14.2.1	Pay and Allowances:	Current Year : 2019-20		Previous Year : 2018-19	
14.2.2	Arrear 7th CPC Non Teaching Employee	-		3,850,869.00	
14.2.3	Arrear 7th CPC Teaching Employee	-		3,024,146.00	
14.2.4	Children Education Allowance - Non Teaching	2,305,975.00		3,650,954.00	
14.2.5	Children Education Allowance - Teaching	5,196,799.00		6,596,181.00	
14.2.6	Conveyance/transport Allowance Non-Teaching Emp.	6,349,126.00		3,606,470.00	
14.2.7	Conveyance/transport Allowance Teaching	12,787,643.00		6,816,602.00	
14.2.8	Dearness Allowance Non-Teaching Emp.	25,452,852.00		17,450,393.00	
14.2.9	DEARNESS ALLOWANCE - TEACHING EMP.	84,514,840.00		49,279,862.00	
14.2.10	Grade Pay Non-Teaching Emp.	-		13,200.00	
14.2.11	GRADE PAY - TEACHING EMP.	10,500.00		-	
14.2.12	Honorarium	2,439,767.00		4,686,581.00	
14.2.13	HONORARIUM (CIL CHAIR)	240,000.00		100,000.00	
14.2.14	HONORARIUM (MOLE CHAIR)	-		140,000.00	
14.2.15	House Rent Allowance Non-Teaching Emp.	7,188,371.00		9,927,466.00	
14.2.16	House Rent Allowance - Teaching Emp.	230,049.00		264,874.00	
14.2.17	Leave Travel Concession - Non Teaching	854,974.00		2,283,681.00	
14.2.18	Leave Travel Concession - Teaching	4,816,008.00		4,963,137.00	
14.2.19	NPA/Dress Allowances	1,682,196.00		560,606.00	
14.2.20	Other Allowances	1,910,443.00		1,672,757.00	
14.2.21	Personal Pay	-		30,210.00	
14.2.22	Pay of Non-Teaching Emp.	203,127,299.00		164,248,597.00	
14.2.23	PAY OF TEACHING EMP.	466,654,125.82		478,394,295.00	
14.2.24	PERSONAL DEVELOPMENT ALLOWANCE	14,036,156.00		30,850,650.00	
14.2.25	WAGES	93,934,453.00		94,534,752.00	
14.2.26	Washing Allowance	720,300.00	934,451,876.82	78,675.00	887,024,958.00
	Medical Allowance				
14.2.27	HC - Medical TA Bills	851,876.00		892,049.00	
14.2.28	HC-Diagnostic Laboratories	4,247,796.00		3,725,016.00	
14.2.29	HC-Medical Expenses to Employee	3,736,892.00		5,178,640.00	
14.2.30	HC-Other Expenses	516,030.00		553,456.00	
14.2.31	HC-Purchase Of Medicine	10,645,063.00		12,038,242.00	
14.2.32	HC-Referral Hospital Bills	10,855,922.00		7,429,576.00	
14.2.33	HC-Remuneration to Specialist	1,686,728.00	32,540,307.00	1,554,416.00	31,371,395.00
	Sub-total(N Plan)		966,992,183.82		918,396,353.00
	Retirement Benefits:				
14.2.34	Deposit Linked Insurance	60,000.00		38,709.00	
14.2.35	GRATUITY - NON TEACHING	137,098,899.00		34,105,788.00	
14.2.36	GRATUITY - TEACHING	55,578,100.00		8,784,250.00	
14.2.37	LEAVE SALARY - TEACHING	9,853,170.00		12,461,839.00	
14.2.38	Leave Salary Non-Teaching Emp.	14,940,879.00		19,697,121.00	
14.2.39	MATCHING CONT. TO DCPS - NON TEACHING	10,101,199.00		5,342,434.00	
14.2.40	MATCHING CONT. TO DCPS - TEACHING	50,428,143.00		44,974,627.00	
14.2.41	Matching Contribution to CPF	5,382,240.00		5,782,840.00	
14.2.42	Medical Allowance	387,904.00		304,500.00	
14.2.43	Pension - Commuted Value (NT)	21,797,316.00		37,073,365.00	
14.2.44	Pension - Commuted Value (T)	8,163,390.00		3,867,931.00	
14.2.45	Retirement TA	1,014,121.00	314,805,361.00	886,807.00	173,320,211.00
	Pension				
14.2.46	PENSION NON-TEACHING EMP.	94,912,181.00		69,146,535.00	
14.2.47	PENSION TEACHING EMP	61,349,126.00		48,703,749.00	
14.2.48	Arrear 7th CPC - Pension - (NT)	-		24,194,571.00	
14.2.49	Arrear 7th CPC - Pension - (T)	-	156,261,307.00	27,778,050.00	169,822,905.00
14.2.50	T O T A L (Non Plan)		471,066,668.00		343,143,116.00
14.1	ESTABLISHMENT EXPS - PLAN		-		-
14.2	ESTABLISHMENT EXPS - NON PLAN		1,438,058,851.82		1,261,539,469.00
14	TOTAL - ESTABLISHMENT EXPENSES		1,438,058,851.82		1,261,539,469.00



SCH. XV - ACADEMIC EXPENSES		Current Year : 2019-20		Previous Year : 2018-19	
Non-Plan:					
15.2	Academic - Departmental Exp				
15.2.01	Administrative Dept. Exp.	255,938.00		1,504,239.00	
15.2.02	Applied Chemistry	1,064,019.00		1,395,370.00	
15.2.03	Applied Geology	485,471.00		1,200,430.00	
15.2.04	Applied Geophysics	623,333.00		384,120.00	
15.2.05	Applied Mathematics	376,159.00		354,118.00	
15.2.06	Applied Physics	466,151.00		504,043.00	
15.2.07	Central Library	306,637.00		480,693.00	
15.2.08	CHEMICAL ENGG. DEPT.	354,174.00		663,028.00	
15.2.09	Civil Engineering Dept.	445,098.00		382,243.00	
15.2.10	Computer Centre	371,908.00		309,872.00	
15.2.11	Computer Science & Engg.	219,304.00		351,907.00	
15.2.12	Electrical Engg.	303,413.00		378,618.00	
15.2.13	Electronics & Communication Engg	994,515.00		877,587.00	
15.2.14	Environmental Science & Engg	599,867.00		387,008.00	
15.2.15	Executive Development Centre	519,778.00		942,510.00	
15.2.16	Fuel & Mineral Engg	740,966.00		587,036.00	
15.2.17	Humanities and Social Sciences	259,475.00		196,990.00	
15.2.18	Management Studies	497,022.00		513,803.00	
15.2.19	Mechanical Engg.	695,113.00		495,034.00	
15.2.20	Mining Engg	796,221.00		1,240,565.00	
15.2.21	Mining Machinery Engg. Deptt.	359,650.00		274,698.00	
15.2.22	Petroleum Engg	509,371.00		340,063.00	
15.2.23	WORKSHOP	1,975,231.00	13,218,814.00	2,205,039.00	15,969,014.00
	Academic - Other Expenses				
15.2.24	ACADEMIC DATA	233,640.00		226,560.00	
15.2.25	Contribution to Seminars/Symposia	168,000.00		3,000.00	
15.2.26	Convocation / Annual Day / Exhibition / Fair	2,758,836.00		5,146,941.00	
15.2.27	Library Periodicals / Binding Expenses	164,379.00		195,991.00	
15.2.28	Other Centres	-		9,181.00	
15.2.29	Prizes to Students	503,594.00		554,221.00	
15.2.30	Publications	114,700.00		424,830.00	
15.2.31	Student Activities	911,201.00		3,764,374.00	
15.2.32	Student Amenities	2,112,644.00		2,076,833.00	
15.2.33	Training to Employees	184,960.80		75,760.00	
15.2.34	Visiting Part-Time Lecturers	1,619,000.00		2,798,000.00	
15.2.35	CRF Revenue Expenses	1,326,790.00		-	
15.2.36	CIIE Revenue Expenses	116,506.00		-	
15.2.37	Vidyalakshmi Scheme Interest	60,242.00	10,274,492.80	-	15,275,691.00
	Entrance Exam & Admission Exp				
15.2.38	Entrance Examination & Admission Expenses	222,637.00		352,856.00	
15.2.39	JRF- Entrance Exam. & Adm. Exp.	4,846.00		1,905,271.00	
15.2.40	M.Sc. & M.Sc. Tech - Entrance Exam. & Adm. Exp.	-		386,166.00	
15.2.41	M. Tech- Entrance Exam & Adm. Exp.	6,813.00	234,296.00	1,078,395.00	3,722,688.00
	Examination Expenses				
15.2.42	Examination Remuneration	6,260,519.40		6,522,583.22	
15.2.43	Examination SEC. EXP.	799,738.00		2,099,429.00	
15.2.44	Foreign Examiner Remuneration	4,008,763.78		-	
15.2.45	Remuneration to Students	103,150.00	11,172,171.18	-	8,622,012.22
	Sports & Gymnasium				
15.2.46	Sports & Gymnasium - Honorarium	2,164,181.00		2,891,300.00	
15.2.47	Sports & Gymnasium - IIT Games	2,092,234.00		3,861,914.00	
15.2.48	Sports & Gymnasium - Regular	2,294,541.00		1,741,936.00	
15.2.49	Sports & Gymnasium - S Pool	2,258,816.00	8,809,772.00	3,898,924.00	12,394,074.00
15.2.50	Scholarship to Students:				
15.2.51	Dual Degree Fellowship	5,866,962.00		6,982,318.00	
15.2.52	MCM SCHOLARSHIP	40,573,375.85		124,482,366.90	
15.2.53	Mess Bill/pocket Exp. (Sc/st)	1,221,500.00		3,460,500.00	
15.2.54	PG Contingency	835,339.00		6,436,434.00	
15.2.55	P G Fellowship	98,422,867.00		137,581,325.00	
15.2.56	Post Doct. Fellowship	648,000.00		607,258.00	
15.2.57	POST DOCTORATE CONTINGENCY	-		47,652.00	
15.2.58	Research Contingency	9,786,203.00		24,831,790.00	
15.2.59	Research Fellowship	349,168,043.00	506,522,289.85	297,098,253.00	601,527,896.90
	Total Academic Expenses (Non Plan)		550,231,835.83		657,511,376.12



SCH. XVI - ADMINISTRATIVE & GENERAL EXPENSES				
16.1	Plan:	Current Year : 2019-20		Previous Year : 2018-19
16.1.1	Telephone/fax/internet/Website exp.	496,350.00		496,350.00
	Sub-total (Plan)		496,350.00	496,350.00
16.2	N Plan:			
16.2.01	Advertisement & Publicity	158,326.00		377,967.00
16.2.02	Audit Expenses	680,670.00		431,480.00
16.2.03	Chairman Secretarial Facility, Bhubneshwar	188,490.00		574,962.00
16.2.04	Electricity Charges	73,679,943.00		55,303,318.00
16.2.05	Generator Running & Maintenance Exp	4,784,312.00		3,493,520.00
16.2.06	Hospitality and Public Relation	32,068.00		13,061.00
16.2.07	Housekeeping of SAH/EDC	7,925,489.00		
16.2.08	IIIF Delhi	62,461.00		129,172.00
16.2.09	IIIF Kolkata	57,710.00		85,320.00
16.2.10	Municipal Taxes	13,979,093.00		843,467.00
16.2.11	Postage and Telegram	842,683.00		1,202,310.00
16.2.12	Printing & Stationary	1,609,346.00		5,033,076.00
16.2.13	School's Membership of Professional Bodies	1,167,700.00		1,105,605.00
16.2.14	Security Services	75,643,626.00		80,907,462.00
16.2.15	TA for Meetings & Meeting Expenses	1,346,430.00		1,358,798.00
16.2.16	TA for Trg./Seminar/Conf. Abroad	401,343.00		95,547.00
16.2.17	TA for Trg/seminar/conf.in India	395,098.00		119,552.00
16.2.18	TA to External Experts/examiners/officials	3,603,597.00		1,949,790.00
16.2.19	TA to Institute Employees	3,044,922.28		1,964,753.00
16.2.20	Telephone/Telex/Fax/Internet Connectivity	8,517,866.00		12,256,852.00
16.2.21	Uniform to Staff	-		126,513.00
16.2.22	Water Supply Expenses	4,456,707.00		8,273,876.00
	Sub-total (N Plan)		202,577,880.28	175,646,401.00
16	Total Administrative & General Expenses (Plan & Non Plan)		203,074,230.28	176,142,751.00



SCH. XVII - REPAIR & MAINTENANCE				
17.01	PLAN			
17.01.01	Repair & Maintenance - Civil	3,177,338.00	4,766,010.00	
	Sub-total (Plan)		3,177,338.00	4,766,010.00
17.02	N. Plan			
17.02.01	AMC of Power Sub Station	-	11,312.00	
17.02.02	Horticulture & Gardening	530,945.00	1,016,748.00	
17.02.03	Public Health & Pest Control	1,877,023.00	1,066,162.00	
17.02.04	Repair & Maint. Exp. - Civil	28,830,568.00	38,161,117.00	
17.02.05	Repair & Maint. Exp. - Computer	483,256.00	472,536.00	
17.02.06	Repair & Maint. Exp. - Electrical	11,671,419.00	15,785,321.00	
17.02.07	Repair & Maint. Exp. - Furniture & Fixtures	1,617,163.00	225,068.00	
17.02.08	REPAIR & MAINT. EXP.- LIFT	7,566,404.00	5,355,778.00	
17.02.09	Repair & Maint. Exp. - Office & Lab. Equipment	397,171.00	457,090.00	
17.02.10	Water Purification AMC ETC.	1,176,746.00	923,562.00	
	Sub-total (N Plan)		54,150,695.00	68,240,704.00
17	Total Repair & Maintenance Expenses (Plan & Non Plan)		57,328,033.00	73,006,714.00

SCH. XVIII - TRANSPORTATION EXPENSES				
18.02	N. Plan			
18.02.01	Vehicle Hiring Expenses	1,457,979.00	1,244,989.00	
18.02.02	Vehicle Insurance	441,179.00	434,297.00	
18.02.03	Vehicle Repairing & Maintenance	207,433.00	549,327.00	
18.02.04	Vehicle Running Expenses	1,279,268.00	3,140,769.00	
18.02	Sub-total (N Plan)		3,385,859.00	5,369,382.00

SCH. XIX - MISCELLANEOUS / OTHER EXPENSES				
19.01	Plan:			
19.01.01	Bank Charges	7,245.40	25,032.00	
19.01.02	Round Off	-	14.00	
19.01	Sub-total (Plan)		7,245.40	25,046.00
19.02	N Plan:			
19.02.01	BANK CHARGES	96,879.30	158,162.19	
19.02.02	Contingent Expenses	2,085,796.00	2,019,868.00	
19.02.03	CRF / CII REVENUE EXP.	-	326,602.00	
19.02.04	Legal Expenses	93,063.00	1,054,355.00	
19.02.05	MISCELLANEOUS EXP.	4,200.56	112.00	
19.02.06	Rajbhasha & Other Statutory Exp.	305,708.00	538,834.00	
19.02.07	Senior Academic Hostel	183,108.00	199,417.00	
19.02.08	Welfare Measures	892,008.00	788,006.00	
19.02	Sub-total (N Plan)		3,660,762.86	5,085,356.19
19.03	Project Account			
19.03.01	Bank Charges	2,243.90	7,470.88	
19.03.02	Interest on GST	-	85,291.00	
19.03.03	Misc. Expenses	2,000.00	-	
19.03.04	Total Admn Expenses Projects		4,243.90	92,761.88
19	Total Miscellaneous Expenses (Plan, Non Plan & Projects)		3,672,252.16	5,203,164.07



SCHEDULES TO RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDING 31ST MARCH, 2020						
SCHEDULES: RECEIPTS						
Sch No.	RECEIPTS	Non Plan 2019-20	Plan 2019-20	Project 2019-20	Total Current Year 2019-20	Total Previous Year 2018-19
R 1	I. Opening Balances					
R.1.1	(a) Cash Balances	12,157.20	-	-	12,157.20	18,744.20
R.1.2	(b) Bank Balances :					
R.1.3	i. In Current Accounts					
R.1.4	Can Bank Parliament Street - N. Delhi	9,537.00	-	-	9,537.00	9,537.00
R.1.5	E - Payment Account - SBI	1,063,775.10	-	-	1,063,775.10	332,674.50
R.1.6	Non Plan A/C (10230776189)	2,383,954.00	-	-	2,383,954.00	88,276.00
R.1.7	SBI Power Jyoti	-	-	-	-	-
R.1.8	SBI Online Fee A/C	61,651.00	-	-	61,651.00	6,591.00
R.1.9	Plan A/C (10230776532)	-	1,857,241.75	-	1,857,241.75	3,013,797.75
R.1.10	Projects - ISM Branch	-	-	229,648.03	229,648.03	230,297.03
		3,518,917.10	1,857,241.75	229,648.03	5,605,806.88	3,681,173.28
R.1.11	ii. In Deposit Accounts					
R.1.12	iii. In Savings Accounts					
R.1.13	Canara Bank SDL Branch, Dhanbad	28,953.00	-	-	28,953.00	28,953.00
R.1.14	Endowment Fund S/B Account	2,283,607.71	-	-	2,283,607.71	3,422,361.01
R.1.15	Non Plan SBI S/B Account (37052696309)	87,826,361.43	-	-	87,826,361.43	11,327,116.69
R.1.16	Plan Saving Account (37057541474)	-	15,710,111.76	-	15,710,111.76	5,429,683.66
R.1.17	Projects-BankofIndia-ISMBranch	-	-	63,018.00	63,018.00	63,018.00
R.1.18	SandvikChairA/c-CanaraBank	-	-	1,394,273.00	1,394,273.00	1,071,779.00
R.1.19	TegjplIA/c-CanaraBank	-	-	-	-	952,794.00
R.1.20	Projects-CanaraBank	-	-	20,353,847.25	20,353,847.25	16,561,439.56
R.1.21	CILChair-CanaraBank	-	-	1,134,696.44	1,134,696.44	1,633,679.44
R.1.22	ISMAANA-CanaraBank	-	-	226,699.00	226,699.00	13,954.00
R.1.23	MoleChair-CanaraBank	-	-	1,752,930.00	1,752,930.00	1,227,786.00
R.1.24	NMDCChair-OpenCast-CanaraBank	-	-	244,153.50	244,153.50	343,377.50
R.1.25	ONGC-AMNGhoshChair-CanaraBank	-	-	1,378,798.58	1,378,798.58	925,993.58
R.1.26	RajivGandhiChair-CanaraBank	-	-	181,628.83	181,628.83	397,352.83
R.1.27	SAIL-NMDCChair-CanaraBank	-	-	2,993,994.48	2,993,994.48	3,376,956.48
R.1.28	Special Fund A/c- Canara Bank	-	-	656,490.00	656,490.00	-
R.1.29	TATASteelChair-CanaraBank	-	-	1,160,550.50	1,160,550.50	202,030.50
R.1.30	UraniumChair-CanaraBank	-	-	406,036.00	406,036.00	392,129.00
	Total	90,138,922.14	15,710,111.76	31,947,115.58	137,796,149.48	47,370,404.25
R 2	II. Grants Received					
R.2.1	a) From Government of India	2,085,031,061.00	990,000,000.00	-	3,075,031,061.00	2,380,000,000.00
R.2.2	b) From State Government	-	-	-	-	-
R.2.3	c) From other sources (details)	-	-	-	-	-
	Total	2,085,031,061.00	990,000,000.00	-	3,075,031,061.00	2,380,000,000.00
R 3	III. Academic Receipts					
R.3.1	Fees from Students	538,579,229.16	-	-	538,579,229.16	528,758,658.90
R.3.2	Academic Expenses	12,621,232.15	-	-	12,621,232.15	1,150,051.10
	Total	551,200,461.31	-	-	551,200,461.31	529,908,710.00
R 4	IV. Receipts against Earmarked / Endowment Funds / Other Reserve Funds					
R.4.1	Institute Development Fund	16,750.00	-	3,895,139.35	3,911,889.35	3,537,482.00
R.4.2	Student Innovative Project Fund	23,940,000.00	-	-	23,940,000.00	27,887,900.00
R.4.3	Benevolent Fund	110,777.00	-	4,800,517.00	4,911,294.00	2,973,218.00
R.4.4	Endowment Fund (Block Grant Scheme)	7,439,865.00	-	-	7,439,865.00	116,931.00
R.4.5	ISM Alumni Association	-	-	-	-	48,000.00
R.4.6	Student Medical Fund	3,698,700.00	-	-	3,698,700.00	3,685,787.00
R.4.7	V M Salgaocar Memorial Sch. Fund	7,998.00	-	-	7,998.00	19,300.00
R.4.8	Chair Funds	-	-	16,387,091.00	16,387,091.00	6,383,526.00
R.4.9	Deptt. Dev. Funds	-	-	17,342,118.35	17,342,118.35	11,765,884.00
R.4.10	General Maintenance Fund	-	-	46,200.00	46,200.00	19,800.00
R.4.11	Outreach Activity	-	-	1,580,827.00	1,580,827.00	358,076.00
R.4.12	Professional Dev. Funds	-	-	4,117,982.00	4,117,982.00	4,223,300.00
	Total	35,214,090.00	-	48,169,874.70	83,383,964.70	61,019,204.00



R 5	V. Receipts against Sponsored Projects / Schemes / Others					
R.5.1	Income Tax Refund	-	-	-	-	-
R.5.2	<i>Consultancy :</i>	-	-	-	-	-
R.5.3	i) Consultancy Services - Liability	-	-	33,576,522.60	33,576,522.60	149,159,177.09
R.5.4	ii) TEST	-	-	2,223,678.10	2,223,678.10	-
R.5.5	iii) EDP	-	-	19,149,711.00	19,149,711.00	-
R.5.6	Fellowship & Associateship Funds	-	-	6,340,544.50	6,340,544.50	5,071,527.55
R.5.7	ISM R&D Projects	-	-	1,059,726.00	1,059,726.00	-
R.5.8	R & D Projects	-	-	196,435,162.84	196,435,162.84	186,159,776.48
R.5.9	UGC Sponsored Projects	-	-	-	-	127,507.00
R.5.10	Seminars/ Symposium/ Conference	-	-	28,570,542.00	28,570,542.00	28,765,700.50
R.5.11	Other Projects	-	-	-	-	329,517,975.36
	Total	-	-	287,355,887.04	287,355,887.04	698,801,663.98

R 6	VI. Receipts against sponsored Fellowships and Scholarships					
R.6.1	(a) Outside Scholarships	7,528,481.00	-	-	7,528,481.00	7,648,576.00
R.6.2	<i>(b) Scholarship Funds:</i>	-	-	-	-	-
R.6.3	ATLAS COPCO Scholarship Fund	-	-	10,902.00	10,902.00	-
R.6.4	Bhaskar Bhattacharya Memorial Fund	-	-	33,461.00	33,461.00	96,300.00
R.6.5	Inderjit & Satyawat Bodhar Scholarship	-	-	-	-	-
R.6.6	Inder Mohan Thapar Foundation Research Award	-	-	350,000.00	350,000.00	350,000.00
R.6.7	ISMAANA Scholarship Award	-	-	4,885,289.00	4,885,289.00	2,811,341.00
R.6.8	L J Jhonson Award	-	-	4,361.00	4,361.00	-
R.6.9	Late Chitra Bhattacharya Memorial Award	-	-	-	-	-
R.6.10	Mata Gurdev Kaur Memorial Fund	-	-	-	-	500.00
R.6.11	NAA Scholarship Fund	-	-	-	-	-
R.6.12	Nirja Sahay Memorial Fund	-	-	-	-	9,750.00
R.6.13	Poonam (Khanna) Singh Endowmend Mem. Fund	-	-	113,329.00	113,329.00	378,500.00
R.6.14	Prof S P Bannerjee Gold Medal Award	-	-	-	-	600,000.00
R.6.15	Renuka Rajhans Memorial Gold Medal Fund	-	-	20,076.00	20,076.00	50,992.00
R.6.16	Smt. Sneha Lata Srivastava Memorial Gold Medal	-	-	5,569.00	5,569.00	5,569.00
R.6.17	Vishesvaraya Ph.D Scheme for Elec. & IT	-	-	-	-	1,813,671.00
R.6.18	Basant Scholarship Fund	18,206.00	-	-	18,206.00	-
R.6.19	J M Dhawan Scholarship Fund	18,206.00	-	-	18,206.00	-
R.6.20	ISS Scholarship Fund	39,715.00	-	-	39,715.00	-
R.6.21	Budhwanti Mrig Mem. Edn. Sch. Fund	1,167,655.00	-	-	1,167,655.00	-
R.6.22	Sandvik Scholarship	-	-	1,500,000.00	1,500,000.00	-
	Total	8,772,263.00	-	6,922,987.00	15,695,250.00	13,765,199.00

R 7	VIII. Interest received on:					
R.7.1	<i>a) Bank Deposits</i>					
R.7.2	Interest from Fixed Deposits	32,068,848.00	18,293,656.00	9,684,042.30	60,046,546.30	59,014,610.00
		32,068,848.00	18,293,656.00	9,684,042.30	60,046,546.30	59,014,610.00
R.7.3	<i>b) Loans & Advances</i>					
R.7.4	Interest from Advance to Employees	930,602.00	-	757.00	931,359.00	409,658.00
		930,602.00	-	757.00	931,359.00	409,658.00
R.7.5	<i>c) Savings Bank Accounts</i>					
R.7.6	Hostel receipts	-	-	-	-	-
R.7.7	Other S/B Accounts	893,735.00	281,797.00	792,147.00	1,967,679.00	2,868,382.82
	Total	893,735.00	281,797.00	792,147.00	1,967,679.00	2,868,382.82

R 8	IX. Investments encashed					
R.8.1	8% GOI BOND (End. Fund Investment)	-	-	-	-	-
	Total	-	-	-	-	-

R 9	X. Term Deposits with Schedules Banks encashed					
R.9.1	Endowment Fund Investment	145,083,210.00	-	-	145,083,210.00	-
R.9.2	GIA & School Income Investments	1,855,000,000.00	915,000,000.00	-	2,770,000,000.00	2,509,000,000.00
R.9.3	Projects Investments	-	-	493,196,564.00	493,196,564.00	207,809,999.00
R.9.4	<i>Scholarship Fund Investments:</i>	-	-	-	-	-
R.9.5	Budhwanti Mrig Mem. Edu. Sch. Fund Investment	7,963,512.00	-	-	7,963,512.00	-
R.9.6	ISM Basant Scholarship Fund Inv.	124,167.00	-	-	124,167.00	-
R.9.7	ISS Scholarship Fund Inv.	270,866.00	-	-	270,866.00	-



R.9.8	J M Dhawan Memorial Gold Medal Fund Investment	124,167.00	-	-	124,167.00	-
	Total	2,008,565,922.00	915,000,000.00	493,196,564.00	3,416,762,486.00	2,716,809,999.00
R 10	XI. Other Income (including Prior Period Income)					
R.10.1	(I) Income From Projects					
R.10.2	School Share Charges	-	-	-	-	-
R.10.3	School Support Charges	8,201,393.00	-	-	8,201,393.00	10,204,526.00
R.10.4	(II) Other Income					
R.10.5	Recoveries From Employees	11,894,213.00	-	-	11,894,213.00	11,173,248.00
R.10.6	Centre for Innovation, Incubation & Entrepreneurship	-	-	-	-	3,400.00
R.10.7	CRF Analysis Charges	17,700.00	-	-	17,700.00	313,250.00
R.10.8	Application Fees for Employment	2,243,300.00	-	-	2,243,300.00	99,500.00
R.10.9	EDC Room Rent	3,731,136.88	-	-	3,731,136.88	3,557,907.04
R.10.10	Electricity Charges From Tenent	6,239,296.20	-	-	6,239,296.20	2,457,179.00
R.10.11	GJLT/PENMAN/LHC RENT	75,416.00	-	-	75,416.00	191,534.00
R.10.12	Income From BRS	-	32,994.00	-	32,994.00	26,500.00
R.10.13	Interest on IT Refund	319,750.00	-	-	319,750.00	-
R.10.14	ISM-IIIF, Delhi Accommodation	4,500.00	-	-	4,500.00	1,000.00
R.10.15	ISM-IIIF, Kolkata Accommodation	161,000.00	-	-	161,000.00	91,200.00
R.10.16	License Fee From Tenents	1,362,636.00	-	-	1,362,636.00	1,045,870.00
R.10.17	Fine / Penalty from Contractors/Suppliers	12,500.00	106,612.00	-	119,112.00	270,857.94
R.10.18	Miscellaneous Income	79,164.00	-	-	79,164.00	-
R.10.19	Cleaning Charges	44,000.00	-	-	44,000.00	-
R.10.20	Medical Charges from Others	2,766.00	-	-	2,766.00	-
R.10.21	Water Charges	11,369.00	-	-	11,369.00	-
R.10.22	SAH Room Rent	1,963,237.20	-	-	1,963,237.20	1,861,308.88
R.10.23	Tender Cost	22,453.00	-	-	22,453.00	864,384.00
	Total	36,385,830.28	139,606.00	-	36,525,436.28	32,161,664.86
R 11	XII. Deposits and Advances					
R.11.1	(A) Deposits (Asset)					
R.11.2	Security Deposit with JSEB	-	-	-	-	2,112,375.00
R.11.3	(B) Deposits (Liabilities)					
R.11.4	Earnest Money Deposit	30,910,720.00	-	-	30,910,720.00	35,440,877.00
R.11.5	Security Deposit	8,349,929.00	6,432,456.00	1,347,946.00	16,130,331.00	6,953,515.00
R.11.6	Retention Money	-	-	-	-	-
R.11.7	(C) Loans & Advances (Asset)					
R.11.8	Advances To Suppliers/ Contractors	200,000.00	-	3,022,904.00	3,222,904.00	19,056,227.00
R.11.9	Advances to Employees:					
R.11.10	H.B.Advance (Non-Plan)	7,005,834.00	-	-	7,005,834.00	4,637,161.00
R.11.11	Staff Advance	9,148,889.00	-	977,165.00	10,126,054.00	11,153,764.00
R.11.12	Car Advance	142,000.00	-	-	142,000.00	128,000.00
R.11.13	Imprest Advance	2,046.00	-	-	2,046.00	45,071.00
R.11.14	Personal Computer Advance	287,895.00	-	-	287,895.00	548,284.00
R.11.15	Scooter Moter Cycle Advance	59,500.00	-	-	59,500.00	126,859.00
R.11.16	Cycle Advance	-	-	-	-	100.00
R.11.17	Festival Advance	-	-	-	-	479,550.00
R.11.18	(D) Sundry Debtors					
R.11.19	Plan Control A/C	-	-	15,346,556.00	15,346,556.00	82,320,852.90
R.11.20	Plan Control A/c - Endowment Interest Receivable	-	-	-	-	37,005,246.00
R.11.21	Project Control A/c (Endowment Fund)	-	-	-	-	76,781,075.33
R.11.22	Project Control A/c (General)	724,049.00	-	-	724,049.00	105,143.00
R.11.23	Rent Receivable	-	-	-	-	25,061.00
R.11.24	TEQIP III Control A/c	-	-	130,674.00	130,674.00	1,687,940.00
R.11.25	TDS Receivable	149,564.00	-	-	149,564.00	-
R.11.26	PEMS Engineering Consultants (P) Ltd.	-	-	1,239,000.00	1,239,000.00	-
	Total	56,980,426.00	6,432,456.00	22,064,245.00	85,477,127.00	278,607,101.23
R 12	XIII. Miscellaneous Receipts including Statutory Receipts					
R.12.1	(A) Statutory Receipts					
R.12.2	(i) Statutory Liabilities - Employees:					
R.12.3	Income Tax (Employees)	128,058,733.00	-	28,711,119.00	156,769,852.00	143,892,237.00
R.12.4	Income Tax (Employees), Rajeev Gandhi Chair	-	-	161,872.00	161,872.00	-
R.12.5	Income Tax (Employees), NMDC Chair	-	-	530,244.00	530,244.00	-
R.12.6	Jharkhand State Professional Tax	1,202,381.00	-	-	1,202,381.00	1,056,165.00
R.12.7	(ii) Statutory Liabilities - Parties:					
R.12.8	Central Tax (CGST)	286,393.50	-	1,977,663.00	2,264,056.50	6,388,394.65
R.12.9	Integrated Tax (IGST)	118,055.00	-	14,167,028.00	14,285,083.00	23,410,425.00
R.12.10	State Tax (SGST)	286,393.50	-	1,977,663.00	2,264,056.50	6,388,394.65
R.12.11	TDS - CGST	985,403.00	524,718.00	1,507,119.00	3,017,240.00	1,422,858.00



R.12.12	TDS - IGST	2,074,301.00	1,068,517.00	782,218.00	3,925,036.00	1,495,112.00
R.12.13	TDS - SGST	985,403.00	524,718.00	1,507,119.00	3,017,240.00	1,422,858.00
R.12.14	Income-Tax (Contractors/Suppliers)	3,466,375.00	862,650.00	2,642,116.00	6,971,141.00	12,547,262.00
R.12.15	Income Tax (u/s 194 I)	-	-	-	-	4,860.00
R.12.16	Income Tax (Professional Services)	3,496,178.00	1,052,248.00	539,531.00	5,087,957.00	798,838.00
R.12.17	Interest on Income tax	-	-	804.00	804.00	-
R.12.18	Interest on TDS-IGST	-	-	121.00	121.00	-
R.12.19	Labour Welfare Cess	325,605.00	391,969.00	48,661.00	766,235.00	270,533.00
R.12.20	Endowment Fund Income Tax (Contractors)	-	-	-	-	-
R.12.21	(iii) Plan Income Tax A/c					
R.12.22	Plan IGST	-	-	-	-	18,517.00
R.12.23	PLAN TDS CGST	545,069.00	-	-	545,069.00	78,522.00
R.12.24	PLAN TDS IGST	1,246,661.00	-	-	1,246,661.00	98,941.00
R.12.25	PLAN TDS SGST	545,069.00	-	-	545,069.00	78,522.00
R.12.26	Plan Income Tax (Contractors)	953,776.00	-	-	953,776.00	626,493.00
R.12.27	Plan Income Tax (Employees)	-	-	-	-	20,924.00
R.12.28	Plan Income Tax (Profession)	1,160,048.00	-	-	1,160,048.00	64,497.00
R.12.29	Plan Sales Tax A/C	-	-	-	-	-
R.12.30	Plan Commissioner of Customs Advance	-	-	-	-	-
R.12.31	(vi) Project - Taxes					
R.12.32	Project CGST	5,328,673.50	-	-	5,328,673.50	7,638,146.50
R.12.33	Project IGST	17,440,583.00	-	-	17,440,583.00	24,655,389.00
R.12.34	Project SGST	5,328,673.50	-	-	5,328,673.50	7,638,146.50
R.12.35	Project - Interest on CGST	7,506.00	-	-	7,506.00	28,744.00
R.12.36	Project - Interest on IGST	28,982.00	-	-	28,982.00	27,919.00
R.12.37	Project - Interest on SGST	7,506.00	-	-	7,506.00	28,744.00
R.12.38	Project - TDS - CGST	1,356,763.00	-	-	1,356,763.00	816,185.00
R.12.39	Project - TDS - IGST	960,358.00	-	-	960,358.00	96,070.00
R.12.40	Project - TDS - SGST	1,356,763.00	-	-	1,356,763.00	816,185.00
R.12.41	Project Income Tax A/c (Employees)	29,301,412.00	-	-	29,301,412.00	23,698,813.00
R.12.42	Project Income Tax (Contractors)	2,436,935.00	-	-	2,436,935.00	3,038,647.00
R.12.43	Project Income Tax (u/s 194 J)	547,681.00	-	-	547,681.00	-
R.12.44	Project Interest on TDS(IGST)	121.00	-	-	121.00	-
R.12.45	Project Interest on TDS(CGST)	177.00	-	-	177.00	-
R.12.46	Project Interest on TDS(SGST)	177.00	-	-	177.00	-
R.12.47	Project Interest on Income Tax	804.00	-	-	804.00	-
R.12.48	Project JVAT	-	-	-	-	-
R.12.49	Project Service Tax A/c	1,188,290.00	-	-	1,188,290.00	-
R.12.50	Project Commissioner of Customs, Kolkata	-	-	-	-	63,500.00
R.12.51	Project Income Tax Contractors/suppliers (TEQIP-III)	809.00	-	-	809.00	-
R.12.52	Project Income Tax Professional Service (TEQIP-III)	5,142.00	-	-	5,142.00	-
R.12.53	PROJECT TDS-CGST (TEQIP-III)	799.00	-	-	799.00	-
R.12.54	PROJECT TDS IGST (TEQIP-III)	16,048.00	-	-	16,048.00	-
R.12.55	PROJECT TDS- SGST (TEQIP-III)	799.00	-	-	799.00	-
R.12.56	(B) Misc Receipts					
R.12.57	B R S Liability	-	-	-	-	2,218.00
R.12.58	Misc. Receipts (Liab)	545,818.00	-	220,794,925.15	221,340,743.15	3,378,384.00
R.12.59	Travel Grant	-	-	1,744,827.20	1,744,827.20	146,315.00
	Total	211,596,664.00	4,424,820.00	277,093,030.35	493,114,514.35	272,157,759.30

R 13	XIV. Any Other Receipts					
R.13.1	Current Liabilities to Employees:					
R.13.2	CanBank, SDL Br. Loan to Employees	3,723,651.00	-	-	3,723,651.00	7,591,633.00
R.13.3	Children Act. Centre Subscription	168,375.00	-	-	168,375.00	171,975.00
R.13.4	Court Attachment Deduction	46,800.00	-	-	46,800.00	52,800.00
R.13.5	DCPS SUBSCRIPTION	45,176,448.00	-	-	45,176,448.00	40,552,633.00
R.13.6	GIS Premium	1,620,580.00	-	-	1,620,580.00	2,347,496.00
R.13.7	New GIS Scheme	356,411.00	-	-	356,411.00	-
R.13.8	LIC Premium	5,677,142.00	-	-	5,677,142.00	5,845,736.00
R.13.9	LTC & Other Recovery from Employees	-	-	-	-	174,008.00
R.13.10	Post Office CTD/RD	231,100.00	-	-	231,100.00	298,000.00
R.13.11	P M Relief Fund	1,101,056.00	-	7,516.00	1,108,572.00	928,198.00
R.13.12	P M Relief Fund (Kerala), NMDC Chair	-	-	4,767.00	4,767.00	-
R.13.13	P M Relief Fund (Rajiv Gandhi Chair)	-	-	3,900.00	3,900.00	-
R.13.14	SBI Cash Award for Non Teaching Employees	-	-	-	-	25,000.00
R.13.15	Scolomin Club	313,750.00	-	-	313,750.00	310,650.00
R.13.16	Staff Recreation Club	270,000.00	-	-	270,000.00	301,500.00
R.13.17	Current Liabilities to Students:					
R.13.18	Benevolent Fund - Liability	183,350.00	-	-	183,350.00	196,450.00
R.13.19	Delhi Ext Centre, CSE	1,176,000.00	-	-	1,176,000.00	1,200,500.00



R.13.20	Delhi Ext Centre, ECE	660,000.00	-	-	660,000.00	684,000.00
R.13.21	Delhi Ext Centre, Elect. Engg	854,000.00	-	-	854,000.00	858,000.00
R.13.22	Delhi Ext Centre, Mech. Engg	756,000.00	-	-	756,000.00	876,000.00
R.13.23	Executive MBA	1,881,673.00	-	-	1,881,673.00	2,900,000.00
R.13.24	CAT 2 Year MBA Admission	1,229,308.00	-	-	1,229,308.00	-
R.13.25	CONCETTO	59,000.00	-	-	59,000.00	-
R.13.26	JAM Msc/M.Sc Tech	2,063,150.00	-	-	2,063,150.00	-
R.13.27	Kolkata Ext. Centre, Mech. Engg.	936,000.00	-	-	936,000.00	2,064,000.00
R.13.28	Kolkata Extension Centre ECE	936,000.00	-	-	936,000.00	1,308,000.00
R.13.29	Kolkata Extension Centre, Elec. Engg.	3,564,000.00	-	-	3,564,000.00	5,094,000.00
R.13.30	Kolkata Extension Centre, CSE	984,000.00	-	-	984,000.00	1,476,000.00
R.13.31	Alumni Subscription	924,000.00	-	-	924,000.00	1,404,000.00
R.13.32	Basant Subscription	1,773,000.00	-	-	1,773,000.00	2,095,050.00
R.13.33	Hostel Mess Fee - Liability	170,571,042.00	-	-	170,571,042.00	178,532,367.00
R.13.34	IIT GATE M TECH Admission A/c	6,292,472.00	-	-	6,292,472.00	68,306.00
R.13.35	IIT JEE Advanced Admission	28,245,121.00	-	-	28,245,121.00	30,022,322.43
R.13.36	Institute Ammenities Deposit	924,000.00	-	-	924,000.00	2,123,500.00
R.13.37	Library Security Deposit	2,355,000.00	-	-	2,355,000.00	5,311,700.00
R.13.38	SBI Cash Award for Best Students	25,000.00	-	-	25,000.00	105,000.00
R.13.39	Student Activity Fund	8,140,500.00	-	-	8,140,500.00	-
R.13.40	Srijan Fund	-	-	-	-	590,000.00
R.13.41	Student Caution Money	924,000.00	-	-	924,000.00	2,329,500.00
R.13.42	Student Insurance Scheme	6,111,438.00	-	-	6,111,438.00	6,717,869.00
R.13.43	Student Uniform Deposit	360,000.00	-	-	360,000.00	2,205,000.00
R.13.44	SME ISM Student chapter	-	-	490,000.00	490,000.00	-
R.13.45	Student of Societies	-	-	2,312,800.00	2,312,800.00	-
R.13.46	Centre of Societal Mission	-	-	211,637.00	211,637.00	-
R.13.47	ISM Alumni Fund	-	-	566,987.00	566,987.00	-
R.13.48	MAS-2019	-	-	587,000.00	587,000.00	-
R.13.49	HEDP/M-Tech-AFGHAN/2018-20	-	-	2,498,822.00	2,498,822.00	-
R.13.50	Current Liabilities - Inter Unit:	-	-	-	-	-
R.13.51	CPF Subscription & Loan Recovery	75,047,458.00	-	-	75,047,458.00	-
R.13.52	GPF Subscription & Loan Recovery	-	-	-	-	70,063,700.00
R.13.53	P.F. Control A/c	999,500.00	-	105,000,000.00	105,999,500.00	43,495.00
R.13.54	Non Plan Control Account	-	-	128,833.00	128,833.00	97,073,281.70
R.13.55	EDC Room Rent	-	-	4,800.00	4,800.00	36,020.00
R.13.56	Electric Charges	-	-	37,922.00	37,922.00	5,888.00
R.13.57	Electric Charges for CIL Chair	-	-	-	-	5,078.00
R.13.58	Electric Charges for Rajiv Gandhi Chair	-	-	3,640.00	3,640.00	6,360.00
R.13.59	Electric Charges From NMDC CHAIR	-	-	7,305.00	7,305.00	10,726.00
R.13.60	Electric Charges From Mess Caterer	-	-	52,644.00	52,644.00	-
R.13.61	Electric charges from Rungta Chair	-	-	32,382.00	32,382.00	-
R.13.62	GJLT Rent	-	-	-	-	4,800.00
R.13.63	IIIF Delhi	-	-	2,000.00	2,000.00	10,000.00
R.13.64	IIIF Kolkata	-	-	1,000.00	1,000.00	-
R.13.65	Institute Support Charges	-	-	45,312,874.83	45,312,874.83	34,434,006.12
R.13.67	License Fee	-	-	14,422.00	14,422.00	3,096.00
R.13.68	Licence Fee From NMDC CHAIR	-	-	12,780.00	12,780.00	12,780.00
R.13.69	License Fee from Rungta Chair	-	-	9,500.00	9,500.00	-
R.13.70	Medical Charges for CIL Chair	-	-	-	-	500.00
R.13.71	Medical Charges From NMDC Chair	-	-	6,000.00	6,000.00	5,500.00
R.13.72	Medical Charges From Rajiv Gandhi Chair	-	-	3,348.00	3,348.00	6,000.00
R.13.73	Medical Charges From Sail NMDC CHAIR FUND	-	-	-	-	500.00
R.13.74	Medical Charges from Rungta Chair	-	-	5,500.00	5,500.00	-
R.13.75	SAH Room Rent	-	-	17,408.00	17,408.00	40,600.00
R.13.76	Scolomin Club for Cil Chair	-	-	-	-	100.00
R.13.77	Scolomin Club for Rajeev Ghandhi Chair	-	-	400.00	400.00	1,200.00
R.13.78	Vehicle Charges	-	-	3,212.00	3,212.00	954.00
R.13.81	Vehicle Charges for Rajiv Gandhi Chair	-	-	249.00	249.00	120.00
R.13.82	Water Charges from Rungta Chair	-	-	1,245.00	1,245.00	-
R.13.83	Water Charges	-	-	7,231.00	7,231.00	-
R.13.84	Water Charges from NMDC Chair	-	-	2,246.00	2,246.00	-
R.13.85	Water Charges from Rajiv Gandhi Chair	-	-	503.00	503.00	-
R.13.86	Deduction in Fixed Assets / WIP:	-	-	-	-	-
R.13.87	Road & Buildings	-	-	-	-	445,951.00
R.13.88	Books & Journals	-	-	-	-	8,799.00
R.13.89	Computers, Peripherals & Internet Equipment	-	-	-	-	289,869.00
R.13.90	Electrical Installation and Equipment	-	-	-	-	-
R.13.91	Scientific and Laboratory Equipment	-	-	-	-	1,214,158.00
R.13.92	Vehicles	-	-	-	-	1,431.00
R.13.93	Capital Work in Progress	-	-	-	-	-



R.13.94	HOSTELS:	-	-	-	-	-
R.13.95	Amber Hostel - Mess Fee	-	-	-	-	14,198.00
R.13.96	Diamond Hostel - Mess Fees	-	-	-	-	15,000.00
R.13.97	Emerald Hostel - Mess Fee	-	-	3,999.00	3,999.00	-
R.13.98	Jasper Hostel - Mess Fees	-	-	-	-	-
R.13.99	Opal Hostel - Mess Fees	-	-	-	-	2,511.00
R.13.100	Ruby Hostel - Mess Fees	-	-	30,000.00	30,000.00	15,000.00
R.13.101	Sapphire Hostel - Mess Fee	-	-	-	-	-
R.13.102	Topaz Hostel - Mess Fee	-	-	-	-	-
R.13.103	Rosaline Hostel- Mess Fee	-	-	45,000.00	45,000.00	-
R.13.104	Mess Fee (Liab)	-	-	180,000,000.00	180,000,000.00	-
R.13.105	Other current Liabilities:	-	-	-	-	-
R.13.106	Loading & Boarding	-	-	16,200.00	16,200.00	-
R.13.107	RTEPDRR-2020	-	-	1,215,495.28	1,215,495.28	-
R.13.108	Central Research Facility	-	-	1,075,110.00	1,075,110.00	-
R.13.109	Others:	-	-	-	-	-
R.13.110	Adjustment in Capital Fund	3,729,087.00	-	-	3,729,087.00	-
R.13.111	Expenses:	-	-	-	-	-
R.13.112	Administrative & General Expenses	21,299.00	-	-	21,299.00	513,678.00
R.13.113	Other Expenses - Miscellaneous	48,004.00	-	-	48,004.00	188,426.28
R.13.114	Establishment Expenses	7,086,417.00	-	-	7,086,417.00	4,714,243.00
R.13.115	Repairs & Maintenance	98,463.00	-	-	98,463.00	150.00
R.13.116	Transportation Expenses	1,005.00	-	-	1,005.00	1,000.00
	Total	387,644,600.00	-	339,736,678.11	727,381,278.11	515,950,312.53

SCHEDULE: PAYMENTS

	PAYMENTS	Non Plan 2019-20	Plan 2019-20	Project 2019-20	Total Current Year 2019-20	Total Previous Year 2018-19
P 1	I. Expenses:					
P.1.1	a) Establishment Expenses	1,193,670,346.82	-	-	1,193,670,346.82	1,161,827,281.00
P.1.2	b) Academics Expenses	561,142,407.98	-	-	561,142,407.98	657,053,480.22
P.1.3	c) Administrative Expenses	197,701,472.28	-	-	197,701,472.28	206,691,480.00
P.1.4	d) Transportation Expenses	3,120,349.00	-	-	3,120,349.00	5,283,264.00
P.1.5	e) Other expenses - Miscellaneous	3,530,309.86	7,245.40	48,237.90	3,585,793.16	5,031,061.35
P.1.6	f) Repairs & Maintenance	50,920,259.00	-	-	50,920,259.00	54,238,077.00
P.1.7	g) Prior Period Expenses	-	-	-	-	49,278.00
P.1.8	h) Interest on HEFA Loan	43,101,689.00	-	-	43,101,689.00	-
	Total	2,053,186,833.94	7,245.40	48,237.90	2,053,242,317.24	2,090,173,921.57
P 2	II. Payments against Earmarked / Endowment Funds / Other Reserve Funds					
P.2.1	School Development Fund	-	-	-	-	80,000.00
P.2.2	Student Innovative Project Fund	3,515,000.00	-	-	3,515,000.00	224,000.00
P.2.3	Benevolent Fund	400.00	-	5,000.00	5,400.00	400.00
P.2.4	Ishan Rajbanshi Merit Scholarshi	30,000.00	-	-	30,000.00	4,000.00
P.2.5	ISM Alumini Association Award Fund	15,000.00	-	-	15,000.00	144,000.00
P.2.6	ISS Scholarship Fund	30,000.00	-	-	30,000.00	-
P.2.7	Student Medical Fund	18,000.00	-	-	18,000.00	12,600.00
P.2.8	Chair Funds	-	-	3,788,594.00	3,788,594.00	5,067,991.00
P.2.9	Deptt. Dev. Funds	-	-	4,774,776.00	4,774,776.00	6,519,272.00
P.2.10	General Maintenance Fund	-	-	1,290,100.00	1,290,100.00	1,161,537.49
P.2.11	Professional Dev. Funds	-	-	2,611,668.00	2,611,668.00	2,500,940.00
P.2.12	Institute Development Fund	30,000.00	-	-	30,000.00	-
	Total	3,638,400.00	-	12,470,138.00	16,108,538.00	15,714,740.49
P 3	III. Payments against sponsored Projects / Schemes					
P.3.1	Consultancy:	-	-	-	-	-
P.3.2	i) Consultancy Services - Liability	-	-	132,238,603.43	132,238,603.43	138,913,330.41
P.3.3	ii) TEST	-	-	2,413,948.00	2,413,948.00	-
P.3.4	iii) EDP	-	-	26,024,668.10	26,024,668.10	-



P.3.5	Departmental Development Fund - Teqip	-	-	144,330.00	144,330.00	775,011.00
P.3.6	Fellowship & Associateship Funds	-	-	6,071,344.00	6,071,344.00	5,181,545.00
P.3.7	ISM R&D Projects	-	-	9,478,152.00	9,478,152.00	7,002,736.00
P.3.8	R&D Projects	-	-	344,262,144.00	344,262,144.00	152,474,154.00
P.3.9	Seminars / Symposium / Conference	-	-	21,602,363.00	21,602,363.00	328,048.00
P.3.10	UGC Sponsored Projects	-	-	161,154.00	161,154.00	294,650.00
P.3.11	Others - Projects	-	-	-	-	125,713,589.49
	Total	-	-	542,396,706.53	542,396,706.53	430,683,063.90

P 4	IV. Payments against Sponsored Fellowships / Scholarships					
P.4.1	(a) Outside Scholarships	8,270,205.00	-	-	8,270,205.00	4,654,906.00
P.4.2	(b) SCHOLARSHIP FUND:	-	-	-	-	-
P.4.3	ATLAS COPCO Scholarship Fund	-	-	30,000.00	30,000.00	12,000.00
P.4.4	Bhaskar Bhattacharya Memorial Fund	-	-	-	-	-
P.4.5	Inderjeet & Satyawat Bodhwar Scholarship	-	-	-	-	-
P.4.6	Inder Mohan Thapar Foundation Research Award	-	-	300,000.00	300,000.00	350,000.00
P.4.7	ISM AANA Scholarship Award	-	-	4,973,248.00	4,973,248.00	2,598,596.00
P.4.8	Late Mrs. Chitra Bhattacharya Memorial Fund	-	-	17,510.00	17,510.00	52,530.00
P.4.9	L J Johnson Award	-	-	-	-	3,811.00
P.4.10	Mata Gurdev Kaur Memorial Fund	-	-	6,990.00	6,990.00	20,290.00
P.4.11	Mitali Sen Gold Medal Memorial End. Fund	-	-	31,490.00	31,490.00	94,470.00
P.4.12	Nirja Sahay Memorial Fund	-	-	11,800.00	11,800.00	35,400.00
P.4.13	Paritosh & Patikrit End. Fund	-	-	5,000.00	5,000.00	2,000.00
P.4.14	Poonam (Khanna) Singh Endowment Mem. Fund	-	-	100,000.00	100,000.00	400,000.00
P.4.15	Prof N L Sharma Mem Fund	-	-	-	-	3,811.00
P.4.16	Prof S Srinivasan Mem. Fund	-	-	-	-	3,811.00
P.4.17	Sandvik Scholarship	-	-	3,750,000.00	3,750,000.00	1,334,000.00
P.4.18	Renuka Rajhans Memorial Gold Medal Fund	-	-	11,800.00	11,800.00	35,400.00
P.4.19	S.L Sehgal Scholarship	-	-	-	-	2,000.00
P.4.20	Smt Kaushalia Devi Gold Medal	-	-	-	-	3,811.00
P.4.21	Smt. Sneh Lata Srivastava Memorial Gold Medal	-	-	11,800.00	11,800.00	35,400.00
P.4.22	Subarna & Sashibhusan Bhattacharya Mem End Fund	-	-	-	-	7,416.00
P.4.23	Vishesvaraya Ph.D Scheme for Elec. & IT	-	-	1,000.00	1,000.00	1,541,420.00
P.4.24	Budhwanti Mrig Mem. Edu. Sch. Fund Investment	9,131,167.00	-	-	9,131,167.00	-
P.4.25	ISM Basant Scholarship Fund Inv.	142,373.00	-	-	142,373.00	-
P.4.26	ISS Scholarship Fund Inv.	310,581.00	-	-	310,581.00	-
P.4.27	J M Dhawan Memorial Gold Medal Fund Investment	142,373.00	-	-	142,373.00	-
	Total	17,996,699.00	-	9,250,638.00	27,247,337.00	11,191,072.00

P 5	VI. Term Deposits with Scheduled Banks					
P.5.1	GIA - FD with SBI, ISM Br. (School Income)	2,137,668,208.00	1,000,000,000.00	-	3,137,668,208.00	2,343,000,000.00
P.5.2	ENDOWMENT FUND FIXED DEPOSITS	243,000,000.00	-	-	243,000,000.00	160,000,000.00
P.5.3	Projects Investments	-	-	440,671,335.00	440,671,335.00	371,300,000.00
	Total	2,380,668,208.00	1,000,000,000.00	440,671,335.00	3,821,339,543.00	2,874,300,000.00

P 6	VII. Expenditure on Fixed Assets and Capital Works-in-Progress					
P.6.1	Furniture & Fixtures	19,224.00	3,093,901.00	-	3,113,125.00	8,176,017.00
P.6.2	Computer Software	71,357.00	9,115,085.00	-	9,186,442.00	14,503,420.00
P.6.3	ISM - IIIF, Kolkata -Endowment Fund Building	-	-	-	-	-
P.6.4	ISM - IIIF, New Delhi -Endowment Fund Building	-	-	-	-	-
P.6.5	Student Amenities	-	-	-	-	-
P.6.6	Vehicles	-	-	-	-	-
P.6.7	Electrical Installation & Equipment	-	19,474,529.00	-	19,474,529.00	6,451,280.00
P.6.8	Books & Journals	172,226.00	553,238.00	-	725,464.00	1,315,364.00
P.6.9	Audio Visual Equipment	-	1,768,209.00	-	1,768,209.00	8,745,316.00
P.6.10	Computers, Peripherals & Internet Equipment	1,333,983.00	7,208,442.00	-	8,542,425.00	13,258,504.00
P.6.11	Scientific & Laboratory Equipment	76,103.00	101,118,358.00	-	101,194,461.00	61,750,187.00
P.6.12	Office Automation	-	2,638,125.00	-	2,638,125.00	1,678,402.00
P.6.13	Office Equipment	14,970.00	353,835.00	-	368,805.00	1,756,576.00



P.6.14	Tube Wells & Water Supply	-	1,076,762.00	-	1,076,762.00	65,048.00
P.6.15	Road & Building	-	28,803,082.00	-	28,803,082.00	34,366,330.00
P.6.16	Science Direct and E Journal (Capital)	-	53,319,775.00	-	53,319,775.00	49,554,072.00
P.6.17	Capital Work In Progress	-	436,452,000.00	-	436,452,000.00	500,556,000.00
	Total	1,687,863.00	664,975,341.00	-	666,663,204.00	702,176,516.00

P 7	VIII. Other Payments including statutory payments					
P.7.1	(A) Statutory Payments					
P.7.2	(i) Statutory Liabilities - Employees					
P.7.3	Income Tax (Employees)	127,874,790.00	-	28,634,619.00	156,509,409.00	146,683,291.00
P.7.4	Income Tax (Employees), Rajeev Gandhi Chair	-	-	161,872.00	161,872.00	-
P.7.5	Income Tax (Employees), NMDC Chair	-	-	530,244.00	530,244.00	-
P.7.6	Jharkhand State Professional Tax	1,170,908.00	-	-	1,170,908.00	881,739.00
P.7.7	(ii) Statutory Liabilities - Parties					
P.7.8	TDS - CGST	963,725.00	553,444.00	1,354,925.00	2,872,094.00	1,327,593.00
P.7.9	TDS - IGST	1,759,529.00	1,246,661.00	852,017.00	3,858,207.00	1,151,384.00
P.7.10	TDS - SGST	963,725.00	553,444.00	1,354,925.00	2,872,094.00	1,327,593.00
P.7.11	Central Tax (CGST)	301,348.72	-	5,553,673.50	5,855,022.22	7,929,112.50
P.7.12	Integrated Tax (IGST)	118,865.00	-	18,101,012.00	18,219,877.00	26,209,086.00
P.7.13	State Tax (SGST)	301,348.72	-	5,553,673.50	5,855,022.22	7,930,564.50
P.7.14	Income-Tax (Contractors/Suppliers)	3,127,154.00	953,776.00	2,435,009.00	6,515,939.00	7,532,711.00
P.7.15	Endowment Fund Income Tax (Contractors)	-	-	-	-	-
P.7.16	Income Tax (u/s 194 I)	1,620.00	-	-	1,620.00	19,440.00
P.7.17	Income Tax - Professional Services	3,161,348.00	1,160,048.00	536,681.00	4,858,077.00	4,133,624.00
P.7.18	Labour Welfare	302,409.00	437,706.00	43,348.00	783,463.00	688,321.00
P.7.19	Interest on Income tax	-	-	804.00	804.00	-
P.7.20	Interest on TDS-CGST	-	-	177.00	177.00	-
P.7.21	Interest on TDS-SGST	-	-	177.00	177.00	-
P.7.22	Interest on TDS-IGST	-	-	121.00	121.00	-
P.7.23	(iii) PLAN- TAX					
P.7.24	Plan (IGST)	-	-	-	-	18,517.00
P.7.25	Plan TDS CGST	545,069.00	-	-	545,069.00	78,522.00
P.7.26	Plan TDS IGST	1,246,661.00	-	-	1,246,661.00	98,941.00
P.7.27	Plan TDS SGST	545,069.00	-	-	545,069.00	78,522.00
P.7.28	Plan Income Contractors	953,776.00	-	-	953,776.00	626,493.00
P.7.29	Plan Income Tax (Employees)	-	-	-	-	20,924.00
P.7.30	PLAN INCOME TAX (PROFESSION)	1,160,048.00	-	-	1,160,048.00	64,497.00
P.7.31	Plan Commissioner of Customs Advance	-	-	-	-	-
P.7.32	PLAN SALES TAX A/C	-	-	-	-	-
P.7.33	(iv) Projects - Tax					
P.7.34	Project (CGST)	5,328,673.50	-	-	5,328,673.50	7,638,146.50
P.7.35	Project (IGST)	17,440,583.00	-	-	17,440,583.00	24,655,389.00
P.7.36	Project (SGST)	5,328,673.50	-	-	5,328,673.50	7,638,146.50
P.7.37	Project - Interest on CGST	7,506.00	-	-	7,506.00	28,744.00
P.7.38	Project - Interest on IGST	28,982.00	-	-	28,982.00	27,919.00
P.7.39	Project - Interest on SGST	7,506.00	-	-	7,506.00	28,744.00
P.7.40	Project - TDS - CGST	1,408,700.00	-	-	1,408,700.00	764,248.00
P.7.41	Project - TDS - IGST	1,019,428.00	-	-	1,019,428.00	36,950.00
P.7.42	Project - TDS - SGST	1,408,700.00	-	-	1,408,700.00	764,248.00
P.7.43	Project Income Tax A/c (Employees)	29,306,412.00	-	-	29,306,412.00	23,693,813.00
P.7.44	Project Income Tax (Contractors)	2,543,890.00	-	-	2,543,890.00	2,931,692.00
P.7.45	Project Income Tax (u/s 194 J)	844,081.00	-	-	844,081.00	312,141.00
P.7.46	Project Commissioner of Customs, Kolkata	-	-	-	-	63,500.00
P.7.47	Project J VAT	-	-	-	-	-
P.7.48	Project Service Tax A/c	1,188,290.00	-	-	1,188,290.00	-
P.7.49	Project Interest on Income Tax	804.00	-	-	804.00	-
P.7.50	Project Interest on TDS-IGST	121.00	-	-	121.00	-
P.7.51	Project Interest on TDS-CGST	177.00	-	-	177.00	-
P.7.52	Project Interest on TDS-SGST	177.00	-	-	177.00	-
P.7.53	Project Income Tax Contractors/suppliers (TEQIP-III)	809.00	-	-	809.00	-
P.7.54	Project Income Tax Professional Service (TEQIP-III)	5142.00	-	-	5,142.00	-
P.7.55	PROJECT TDS-CGST (TEQIP-III)	799.00	-	-	799.00	-
P.7.56	PROJECT TDS IGST (TEQIP-III)	16048.00	-	-	16,048.00	-
P.7.57	PROJECT TDS- SGST (TEQIP-III)	799.00	-	-	799.00	-
P.7.58	(B) Misc Payments					
P.7.59	B R S Liability	-	-	-	-	-
P.7.60	Misc. Receipts (Liab)	525,980.00	-	29,914,488.20	30,440,468.20	10,346,625.00
P.7.61	Travel Grant	-	-	1,521,193.00	1,521,193.00	146,315.00



	Total	210,909,674.44	4,905,079.00	96,548,959.20	312,363,712.64	285,877,496.00
P 8	IX. Refunds of Grants					
P 9	X. Deposits and Advances					
P.9.1	Deposits (Assets)	-	-	-	-	-
P.9.2	Security Deposit with JSEB	-	-	-	-	-
P.9.3	GST receivable on Supply to SEZ	-	-	-	-	-
P.9.4	TDS Receivable	124,564.00	-	768,112.00	892,676.00	40,000.00
P.9.5	TDS IGST Receivable	-	-	222,186.00	222,186.00	-
P.9.6	Deposits (Liabilities)	-	-	-	-	-
P.9.7	EARNEST MONEY DEPOSIT	21,854,310.00	-	-	21,854,310.00	25,379,683.00
P.9.8	SECURITY DEPOSIT	7,484,930.00	4,340,206.00	253,544.00	12,078,680.00	6,119,864.00
P.9.9	Retention Money	-	-	-	-	8,451,107.00
P.9.10	Provision for Books & Journals	-	-	-	-	5,556,936.00
P.9.11	Loans & Advances (Asset)	-	-	-	-	-
	Advances to other Suppliers/					
P.9.12	Contractors	2,385,344.00	89,465,595.00	12,438,258.00	104,289,197.00	6,352,915.00
P.9.13	Advances to CPWD	-	181,500,000.00	-	181,500,000.00	-
P.9.14	Advances to Employees	-	-	-	-	-
P.9.15	H.B.Advance (Non-Plan)	8,891,615.00	-	-	8,891,615.00	11,116,677.00
P.9.16	Staff Advance	12,586,435.00	-	2,663,219.00	15,249,654.00	15,820,476.00
P.9.17	Car Advance	-	-	-	-	-
P.9.18	Imprest Advance	1,414,659.00	-	-	1,414,659.00	406,056.00
P.9.19	Personal Computer Advance	332,000.00	-	-	332,000.00	105,543.00
P.9.20	Scooter Moter Cycle Adv.	-	-	-	-	450.00
P.9.21	Cycle Advance	-	-	-	-	-
P.9.22	Festival Advance	-	-	-	-	-
P.9.23	Sundry Debtors	-	-	-	-	-
P.9.25	Consultancy Receivable	-	-	-	-	55,952.00
P.9.26	Plan Control A/C	-	-	15,346,556.00	15,346,556.00	234,623.00
P.9.27	Project Control A/c (Endowment Fund)	-	-	-	-	-
P.9.28	Project Control A/c (General)	12,883.00	-	-	12,883.00	97,347,496.70
P.9.29	TEQIP III Control A/c	-	-	168,858.00	168,858.00	1,757,940.00
P.9.30	Non Plan Control A/c	-	2,200.00	-	2,200.00	-
P.9.31	PEMS Engineering Consultants (P) Ltd.	-	-	500,000.00	500,000.00	-
	Total	55,086,740.00	275,308,001.00	32,360,733.00	362,755,474.00	178,745,718.70
P 10	XI. Other Payments					
	(A) Outstanding Expenses & Allowances					
P.10.1	Outstanding Expenses	-	-	-	-	340,613.00
P.10.2	Outstanding Pay and Allowance	64,540,042.00	-	-	64,540,042.00	60,411,750.00
P.10.4	(B) Current Liabilities to Employees	-	-	-	-	-
P.10.5	CanBank, SDL Br. Loan to Employees	3,723,651.00	-	-	3,723,651.00	7,591,633.00
P.10.6	Children Act. Centre Subscription	167,025.00	-	-	167,025.00	171,975.00
P.10.7	Court Attachment Deduction	46,800.00	-	-	46,800.00	52,800.00
P.10.8	CPF Subscription & Loan Recovery	-	-	-	-	-
P.10.9	DCPS SUBSCRIPTION	44,683,500.00	-	-	44,683,500.00	50,347,504.00
P.10.10	GIS Premium	2,691,036.00	-	-	2,691,036.00	2,519,680.00
P.10.11	LIC Premium	5,671,067.00	-	-	5,671,067.00	5,845,724.00
P.10.12	LTC & Other recoveries from employees	77,910.00	-	-	77,910.00	96,098.00
P.10.13	P M Relief Fund	1,115,723.00	-	2,516.00	1,118,239.00	928,198.00
P.10.14	Post Office CTD/RD	231,100.00	-	-	231,100.00	298,000.00
P.10.15	SBI Cash Award for Non Teaching Employees	-	-	-	-	-
P.10.16	Scolomin Club	311,950.00	-	-	311,950.00	309,100.00
P.10.17	Staff Recreation Club	267,400.00	-	-	267,400.00	301,200.00
P.10.18	(C) Current Liabilities to Students	-	-	-	-	-
P.10.19	Benevolent Fund - Liability	393,966.00	-	-	393,966.00	24,254.00
P.10.20	Delhi Extension Centre (CSE)	1,322,237.00	-	-	1,322,237.00	827,156.00
P.10.21	Delhi Extension Centre (ECE)	585,386.00	-	-	585,386.00	705,377.00
P.10.22	Delhi Extension Centre (Electrical Engineering)	32,438.00	-	-	32,438.00	568,734.00
P.10.23	Delhi Extension Centre (Mech Engineering)	389,250.00	-	-	389,250.00	237,784.00
P.10.24	Executive MBA	2,520,006.00	-	-	2,520,006.00	2,826,672.00
P.10.25	Kolkata Ext. Centre, Mech. Engg.	432,336.00	-	-	432,336.00	1,845,398.00
P.10.26	Kolkata Extension Centre ECE	1,102,175.00	-	-	1,102,175.00	1,588,505.00
P.10.27	Kolkata Extension Centre, Elec. Engg.	158,983.00	-	-	158,983.00	2,959,655.00
P.10.28	Kolkata Extension Centre, CSE	2,005,683.00	-	-	2,005,683.00	1,892,211.00
P.10.29	Alumni Subscription	67,000.00	-	-	67,000.00	51,000.00
P.10.30	Basant Subscription	2,452,000.00	-	-	2,452,000.00	2,103,450.00
P.10.31	Hostel Mess Fee - Liability	180,967,100.00	-	-	180,967,100.00	90,771,500.00



P.10.32	IIT JEE Advanced Admission	1,156,127.00	-	-	1,156,127.00	1,652,700.00
P.10.33	IIT- GATE M.Tech Admissions	10,475.00	-	-	10,475.00	-
P.10.34	Institute Ammenities Deposit	1,028,599.00	-	-	1,028,599.00	877,500.00
P.10.35	Library Secuirty Deposit	4,510,000.00	-	-	4,510,000.00	266,000.00
P.10.36	SBI Cash Award for Best Students	25,000.00	-	-	25,000.00	105,000.00
P.10.37	SRIJAN Fund	7,773,500.00	-	-	7,773,500.00	590,000.00
P.10.38	STUDENT CAUTION MONEY	5,771,123.00	-	-	5,771,123.00	9,242,480.00
P.10.39	Student Insurance Scheme	3,209,433.00	-	-	3,209,433.00	5,666,556.00
P.10.40	Student Uniform Deposit	2,459,550.00	-	-	2,459,550.00	6,195,945.00
P.10.41	(D) Current Liabilities - Inter Unit	-	-	-	-	-
P.10.42	GPF Subscription & Loan Recovery	74,987,200.00	-	-	74,987,200.00	70,062,700.00
P.10.44	Non Plan Control Endowment Fund	-	-	-	-	113,786,321.33
P.10.45	Non Plan Control A/c	-	-	-	-	64,830,818.71
P.10.46	P.F. Control A/c	1,000,000.00	-	105,000,000.00	106,000,000.00	1,432,845.00
P.10.47	Project Control A/c	-	-	-	-	17,359,406.19
P.10.48	Electric Charges for Rajiv Gandhi Chair	-	-	3,046.00	3,046.00	-
P.10.49	Electric Charges from NMDC Chair	-	-	6,805.00	6,805.00	-
P.10.50	License Fee from NMDC Chair	-	-	12,780.00	12,780.00	-
P.10.51	Medical Charges From NMDC Chair	-	-	6,000.00	6,000.00	-
P.10.52	Medical Charges From Rajiv Gandhi Chair	-	-	3,348.00	3,348.00	-
P.10.53	Scolomin Club for Rajeev Ghandhi Chair	-	-	400.00	400.00	-
P.10.54	Vehicle Charges for Rajiv Gandhi Chair	-	-	249.00	249.00	-
P.10.55	Water Charges from NMDC Chair	-	-	2,246.00	2,246.00	-
P.10.56	Water Charges from Rajiv Gandhi Chair	-	-	503.00	503.00	-
P.10.57	(E) Hostels	-	-	-	-	-
P.10.58	Amber Hostel - Mess Fee	-	-	47,282,940.00	47,282,940.00	48,990,124.00
P.10.59	Diamond Hostel - Mess Fee	-	-	8,910,908.00	8,910,908.00	10,291,260.00
P.10.60	Emerald Hostel - Mess Fee	-	-	10,481,785.00	10,481,785.00	12,054,052.00
P.10.61	Jasper Hostel - Mess Fee	-	-	51,110,460.00	51,110,460.00	67,584,242.00
P.10.62	Opal Hostel - Mess Fee	-	-	8,144,116.00	8,144,116.00	8,061,548.00
P.10.63	Ruby Hostel - Mess Fee	-	-	24,332,535.00	24,332,535.00	21,788,089.00
P.10.64	Sapphire Hostel - Mess Fee	-	-	17,659,845.00	17,659,845.00	20,269,991.00
P.10.65	Topaz Hostel - Mess Fee	-	-	9,485,215.00	9,485,215.00	11,106,665.00
P.10.66	Mess Fee (Liab)	-	-	2,732,609.00	2,732,609.00	-
P.10.67	(F) Loans (Liability)	-	-	-	-	-
P.10.68	Loan from HEFA	269,400,000.00	-	-	269,400,000.00	134,700,000.00
P.10.69	(G) Others	-	-	-	-	-
P.10.70	Fees from Students	6,814,227.00	-	-	6,814,227.00	16,611,352.00
P.10.71	Income from Projects	-	-	-	-	35,889.00
P.10.72	Other Income	12,989.00	-	-	12,989.00	28,009.00
P.10.73	Interest Income	-	-	2,275,285.00	2,275,285.00	1,062,480.00
P.10.74	Adjustments to Capital Fund	-	-	300,000.00	300,000.00	-
P.10.75	(H) Other Current Liabilities	-	-	-	-	-
P.10.76	RTEPDRR-2020	-	-	86,141.00	86,141.00	-
P.10.77	Central Research Facility	-	-	289,092.00	289,092.00	-
P.10.78	BE Course for Afghan Students-2014	-	-	1,203,250.00	1,203,250.00	-
P.10.79	SME ISM Student chapter	-	-	490,000.00	490,000.00	-
P.10.80	Student of Societies	-	-	2,312,800.00	2,312,800.00	-
P.10.81	Centre of Societal Mission	-	-	210,887.00	210,887.00	-
P.10.82	Ism Alumni Fund	-	-	628,948.00	628,948.00	-
P.10.83	MAS-2019	-	-	451,983.00	451,983.00	-
P.10.84	HEDP/M-Tech-AFGHAN/2018-20	-	-	717,059.00	717,059.00	-
P.10.85	(I) Provisions	-	-	-	-	-
P.10.86	Provision for payment to CPWD	-	-	17,600,000.00	17,600,000.00	-
P.10.87	Provision for Interest on HEFA Loan	8,782,099.00	-	-	8,782,099.00	-
	Total	702,896,086.00	-	311,743,751.00	1,014,639,837.00	880,267,944.23
P 11	XII. Closing Balances					
P.11.1	(a) Cash in hand	54,108.20	-	350,000.00	404,108.20	12,157.20
P.11.2	(b) Bank Balances	-	-	-	-	-
P.11.3	i. In Current Accounts	-	-	-	-	-
P.11.4	Can Bank Parliament Street - N. Delhi	9,537.00	-	-	9,537.00	9,537.00
P.11.5	E - Payment Account - SBI	492,477.10	-	-	492,477.10	1,063,775.10
P.11.6	SBI Dhn Non Plan Account	1,929,486.00	-	-	1,929,486.00	2,613,602.03
P.11.7	SBI Online Fee A/c (8197)	20,710.60	-	-	20,710.60	61,651.00
P.11.8	Plan A/C (10230776532)	-	1,890,235.75	229,648.03	2,119,883.78	1,857,241.75
P.11.9	Projects - ISM Branch	-	-	-	-	-
	Total	2,452,210.70	1,890,235.75	229,648.03	4,572,094.48	5,605,806.88
P.11.10	ii. In Deposit Accounts	-	-	-	-	-
P.11.11	iii. In Savings Accounts	-	-	-	-	-
P.11.12	Canara Bank SDL Branch, Dhanbad	28,953.00	-	37,665,144.14	37,694,097.14	28,953.00



P.11.13	Endowment Fund S/B Account	29,662.59	-	-	29,662.59	2,283,607.71
P.11.14	Non Plan SBI S/B Account (37052696309)	80,319,059.99	-	-	80,319,059.99	87,826,361.43
P.11.15	Plan Saving Account (37057541474)	-	5,053,786.36	-	5,053,786.36	15,710,111.76
P.11.16	Projects - Bank of India - ISM Branch	-	-	63,018.00	63,018.00	63,018.00
P.11.17	Sandvik Chair A/c - Canara Bank	-	-	1,692,245.00	1,692,245.00	1,394,273.00
P.11.18	Tegip II A/c - Canara Bank	-	-	-	-	-
P.11.19	Projects - Canara Bank	-	-	-	-	20,353,847.25
P.11.20	CIL Chair - Canara Bank	-	-	1,925,127.44	1,925,127.44	1,134,696.44
P.11.21	ISMAANA - Canara Bank	-	-	502,988.00	502,988.00	226,699.00
P.11.22	Mole Chair - Canara Bank	-	-	2,636,235.00	2,636,235.00	1,752,930.00
P.11.23	NMDC Chair - Open Cast - Canara Bank	-	-	373,711.50	373,711.50	244,153.50
P.11.24	ONGC - AMN Ghosh Chair - Canara Bank	-	-	2,112,183.58	2,112,183.58	1,378,798.58
P.11.25	Rajiv Gandhi Chair - Canara Bank	-	-	1,439,841.83	1,439,841.83	181,628.83
P.11.26	SAIL - NMDC Chair - Canara Bank	-	-	4,925,479.48	4,925,479.48	2,993,994.48
P.11.27	Special Fund A/c - Canara Bank	-	-	13,070,844.98	13,070,844.98	656,490.00
P.11.28	TATA Steel Chair - Canara Bank	-	-	3,695,886.50	3,695,886.50	1,160,550.50
P.11.29	Uranium Chair - Canara Bank	-	-	420,124.00	420,124.00	406,036.00
P.11.30	Canara Bank DST-SERB Bank A/c	-	-	600,000.00	600,000.00	-
P.11.31	SBI Online Fee A/c (7697)	0.17	-	-	0.17	-
	Total	80,377,675.75	5,053,786.36	71,122,829.45	156,554,291.56	137,796,149.48



BALANCE SHEET OF G.P.F., C.P.F. AND D.C.P.S. ACCOUNT AS AT 31st MARCH 2020			
(Amount in Rs)			
Sl. No.	LIABILITIES	Current Year 2019-20	Previous Year 2018-19
1	GPF MEMBERS' FUNDS:		
1.1	Balance at the beginning of the year	504,376,488.00	463,611,659.00
1.2	Add: Subscriptions/Loan Recovery during the year	73,997,200.00	69,243,700.00
1.3	Add: Interest credited to members	40,373,760.00	36,532,920.00
1.4	Add: Transfer from CPF Member's fund a/c	-	0.00
1.5	Sub-total	618,747,448.00	569,388,279.00
1.6	Less: Advances, withdrawals & final payments	72,489,459.00	65,011,791.00
1.7	Balance at the end of the year	546,257,989.00	504,376,488.00
2	CPF MEMBERS' FUNDS:		
2.1	Balance at the beginning of the year	1,553,250.00	1,553,250.00
2.2	Add: Subscriptions & Loan recovery during the year	-	-
2.3	Add: Interest credited to members	-	-
2.4	Add: Matching contribution to the members	-	-
2.5	Sub-total	1,553,250.00	1,553,250.00
2.6	Less: Advances, withdrawals & final payments	-	-
2.7	Less: Adjustment for transfer from CPF to GPF:	-	-
2.8	(a) Transferred to GPF Subscription Account	-	-
2.9	(b) Transferred to Non Plan Capital Account	-	-
2.10	Balance as at the end of the year	1,553,250.00	1,553,250.00
3	DCPS MEMBERS' FUNDS:		
3.1	Balance at the beginning of the year	404,103.00	404,103.00
3.2	Subscriptions during the year	-	0.00
3.3	Add: Matching contribution to the members	-	0.00
3.4	Add: Interest credited to members	-	0.00
3.5	Less: Amount transferred to NSDL Account	-	-
3.6	Balance as at the end of the year	404,103.00	404,103.00
4	GENERAL RESERVE:		
4.1	Balance at the beginning of the year	97,966,909.58	93,965,110.10
4.2	Add: Excess of income over exp. for the year and others	819,555.92	4,001,799.48
4.3	Less : Prior Period Interest Payment	-	-
4.4	Balance as at the end of the year	98,786,465.50	97,966,909.58
5	PROVISIONS		
5.1	Provisions for Intt on CPF Matching Contribution		
5.2	Balance at the beginning of the year	7,595,248.00	2,301,118.00
5.3	Add: Provision created during the year	5,430,695.00	5,294,130.00
5.4	Less: Payment made against Provisions	-	-
5.5	Balance as at the end of the year	13,025,943.00	7,595,248.00
6	TOTAL LIABILITIES	660,027,750.50	611,895,998.58



	ASSETS	Current Year 2019-20	Previous Year 2018-19
7	CURRENT ASSETS:		
7.1	Investments:		
7.2	Balance at the beginning of the year	521,381,182.43	464,606,793.93
7.3	Add: Investments made during the year	474,228,315.00	234,749,729.50
7.4	Less: Investments encashed during the year	433,715,193.43	177,975,341.00
7.5	Balance as at the end of the year	561,894,304.00	521,381,182.43
7.6	Accrued Interest on Investment:		
7.7	Opening Balance	84,623,245.00	94,760,575.00
7.8	Additions/Deductions during the year	8,175,200.21	-10,137,330.00
7.9	Balance as at the end of the year	92,798,445.21	84,623,245.00
7.10	Total Investment incld. Accrued Interest	654,692,749.21	606,004,427.43
7.11	CASH & BANK BALANCES:		
7.12	Cash at Bank with SBI, ISM Br., Dhanbad	5,335,001.29	5,891,071.15
7.13	Sundry Debtors:		
7.14	Non Plan Control Account	0.00	500.00
8	TOTAL ASSETS	660,027,750.50	611,895,998.58

(PRABODH PANDEY)
DY. REG(F&A)/REGISTRAR(ACTG.)

(PROF. K. PATTANAYAK)
DY. DIRECTOR

(PROF. RAJIV SHEKHAR)
DIRECTOR



**INCOME AND EXPENDITURE ACCOUNT OF G.P.F., C.P.F. AND D.C.P.S. ACCOUNT FOR THE YEAR ENDED 31st MARCH 2020**

(Amount in Rs)

Sl. No.	INCOME	Current Year 2019-20	Previous Year 2018-19
1	Interest / Income from Investments	38,299,254.25	55,773,366.98
2	Interest on Saving Bank A/c	149,557.00	193,078.00
3	Interest Accrued on investment	8,175,200.21	-10,137,330.00
4	TOTAL (A)	46,624,011.46	45,829,114.98
	EXPENDITURE		
6	Interest credited to members accounts	45,804,455.00	41,827,050.00
7	Bank charges	0.00	265.50
8	Round off	0.54	
9	TOTAL (B)	45,804,455.54	41,827,315.50
10	Balance being excess of Income over Expenditure (A - B)	819,555.92	4,001,799.48
11	BALANCE BEING SURPLUS CARRIED TO GENERAL RESERVE	819,555.92	4,001,799.48


(PRABODH PANDEY)
DY. REG(F&A)/REGISTRAR(ACTG.)


(PROF J K PATTANAYAK)
DY. DIRECTOR

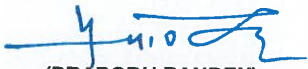

(PROF RAJIV SHEKHAR)
DIRECTOR



UDIN: 20419339AAAABD9777

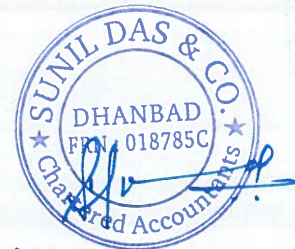


RECEIPTS AND PAYMENTS ACCOUNT OF G.P.F., C.P.F. AND D.C.P.S. ACCOUNT FOR THE YEAR ENDED 31st MARCH 2020			
			(Amount in Rs)
Sl. No.	RECEIPTS	Current Year 2019-20	Previous Year 2018-19
1	O.B: Cash at Bank with SBI,ISM Br,Dhanbad	5,891,071.15	1,078,521.17
2	Interest / Income from Investments	19,923,110.18	8,321,486.48
3	Subscription & loan rec. from GPF members	73,997,200.00	69,244,200.00
4	Subscription & loan rec. from CPF members	-	-
5	Subscription from DCPS members	-	-
6	Matching contribuion to CPF members	-	-
7	Matching contribuion to DCPS members	-	-
8	Investments encashed	224,780,733.50	28,000,000.00
9	Receipt from Plan / Non-Plan A/c	1,000,000.00	-
10	Receipt from Project Control A/c(General Res)	-	42,303,415.00
11	TOTAL	325,592,114.83	148,947,622.65
PAYMENTS			
12	Advances / withdrawals / final payments to GPF members	72,489,459.00	65,011,791.00
13	Advances / withdrawals / final payments to CPF members	-	-
14	Refund/ Transfer from DCPS to NSDL A/c	-	-
15	Investments made during the year	131,000,000.00	78,000,000.00
16	Refund of dues to Non Plan / Plan / Project A/c	116,767,654.54	44,495.00
17	Interest Paid	-	-
18	Bank Charges	-	265.50
19	CB: Cash at Bank with SBI,ISM Br.,Dhanbad	5,335,001.29	5,891,071.15
20	TOTAL	325,592,114.83	148,947,622.65


(PRABODH PANDEY)
DY. REG(F&A)/REGISTRAR(ACTG.)


(PROF J K PATTANAYAK)
DY. DIRECTOR


(PROF RAJIV SHEKHAR)
DIRECTOR



UOLN: 20419339A AAABD9777



SCHEDULE - XX: SIGNIFICANT ACCOUNTING POLICIES

20.1 ACCOUNTING CONVENTION:

The financial statements of Plan, Non-Plan and Project have been prepared on the basis of historical cost convention unless otherwise stated and generally on accrual basis of accounting to the extent possible.

20.2 REVENUE RECOGNITION

Fees from students, sale of admission forms, interest on saving bank A/c, Income from interest bearing advances etc, are accounted on realisation basis. The tuition fee is collected on semester basis commencing from July to June. Interest on Investment, Income from land, Building and other properties etc., are accounted on accrual basis.

20.3 EXPENDITURE IN FOREIGN CURRENCY

Transactions denominated in foreign currency are accounted for at the exchange rate prevailing on the date of the transaction as per Bank Advice. During the year expenditure incurred in foreign currencies for payment to foreign examiners in equivalent Indian Rupees is Rs. 40.09 Lakhs.

20.4 INVENTORIES VALUATION:

Expenditure on purchase of chemicals, glassware, publications, stationery and other stores is accounted as revenue expenditure.

20.5 INVESTMENTS:

- (a) Investments both long term and short term have been shown at face value / cost.
- (b) No shortfall is expected in the value of investments as the same are to be redeemed by Govt. Institutions at face value.

20.6 FIXED ASSETS AND DEPRECIATION

A. FIXED ASSETS:

- (a) Fixed assets have been stated at cost of acquisition inclusive of inward freight, duties, taxes and incidental/direct expenses related to acquisition to the extent possible.
- (b) Fixed assets received by way of non-monetary grants have been capitalised at values stated by corresponding credit to capital fund.
- (c) Expenditure for renovation of buildings has been treated as Capital Expenditure.
- (d) Assets acquired under PDA have been capitalised.
- (e) Where assets are fully depreciated, it is carried at a residual value of Rs. 1.00 in the Balance Sheet and is not depreciated further. Thereafter, depreciation is calculated on the additions of each year separately at the rate of depreciation applicable for that assets head.
- (f) Assets created out of sponsored projects, where the ownership of such assets vests with the Institution are set up by credit to Capital Fund and merged with the Fixed Assets of the Institute.

B. DEPRECIATION:

Fixed assets are valued at cost less accumulated depreciation. Assets procured at any point of time during the year has been depreciated for the full year. Depreciation on fixed assets is provided on Straight Line Method basis. The depreciation for Project Assets has been debited to the Capitalised fund for Assets Account at the same rate applicable for the respective assets head.



No depreciation was provided till 2006-07. With the change of accounting system from cash accounting to Accrual accounting, the depreciation was provided for the first time during 2007-08, for all the previous years upto 31st March 2007 by debiting Capital Fund Account. For the purpose of determining the quantum of depreciation for all the previous years, depreciation has been calculated separately on diminishing balance method (written down value) for each item from 1997-98 onwards at the following rates and at the ad-hoc rates to cover all the years up to and including 1996-97. In order to reflect the assets at face value, the provision for accumulated depreciation has been shown under Previous Liabilities & Provisions.

Methods of charging Depreciation was further revised w.e.f. 1.4.16 as per the Guidelines and prescribed rates of MHRD, Govt. of India.

The Depreciation rates and ad hoc rates adopted are as follows:

Asset's Name	Ad-hoc rate of Depreciation on Opening Balance as on 01.04.1997	Depreciation rate on yearly basis upto 31.03.2016	Rate of Depw.e.f.01.04.2016 on Straight Line Method
Tangible Assets			
1. Land	0%	0%	0%
2. Road & Buildings	25%	10%	2%
3. Tube Well & Water supply equipment	50%	10%	2%
4. Electrical Installation & Equipment	50%	15%	5%
5. Plant & Machinery	50%	15%	5%
6. Scientific & Laboratory Equipment	50%	15%	8%
7. Office Equipment	50%	10%	7.5%
8. Audio Visual Equipment	50%	15%	7.5%
9. Computers & Peripherals	80%	60%	20%
10. Furniture, Fixtures & Fittings	50%	10%	7.5%
11. Vehicles	50%	15%	10%
12. Library Books & Scientific Journals	80%	60%	10%
Intangible Assets			
13. E Journals	-	40%	40%
14. Computer Software	80%	60%	40%

20.7 GOVERNMENT GRANTS:

- (a) The MHRD grant utilized towards capital expenditure is transferred to the Capital Fund.
- (b) The MHRD grants for meeting Revenue Expenditure are treated as income of the year in which they are realised.
- (c) Unutilized grants (including advances paid from such grants) are carried forward and exhibited as a liability in the Balance Sheet.
- (c) Grants received under head OH-35 has been utilised towards construction of buildings and creation of capital assets, grants received under head OH-31 have been utilised for general expenditures, scholarship and fellowship to students and grants received under OH-36 has been utilised towards Pay & Allowances and Retirement benefits.

20.8 RETIREMENT BENEFITS:

Retirement benefits are accounted for on cash basis. Provision for retirement benefits viz. leave salary, pension liability etc. has not been made during the year due to unavailability of sufficient Grant-in-Aid. However, provision for Gratuity (Teaching & Non-teaching staff) has been made for Rs. 16.37 crores during the year on the basis of Actuarial valuation of liability given by LIC of India. Limited amount could be provisioned due to limited availability of grant.

20.9 INCOME TAX:

The income of the Institute is exempted from Income Tax under Section 10 (23C) (iii ab) of the Income Tax Act 1961. No provision for tax is therefore made in the accounts.



SCHEDULE - XXI: CONTINGENT LIABILITIES AND NOTES ON ACCOUNTS

21.1 CONTINGENT LIABILITIES:

- (a) There were no disputed demands in respect of income tax, sales tax, goods and service tax, municipal taxes, etc. as at the end of the year.
- (b) Some suits were filed against IIT(ISM), by former/ present employees/ students of Institute and were pending for decision in various courts. These cases are mainly related to service matters. The quantum of the claims are not ascertainable.
- (c) Letters of Credits established by the Bank on behalf of the Institution and outstanding as on 31.03.2020 – Rs 2126.99 Lakhs.
- (d) Guarantees extended by Bank on behalf of the Institute and outstanding as on 31.03.2020 – Rs. 1,66,27,500/- to DVC (Previous Year Rs1,85,00,000/-).

21.2 CAPITAL COMMITMENTS

Estimated value of contracts remaining to be executed on Capital Account and not provided for (Net of Advances) amounted to about Rs. 210Crores as on 31.3.2020. The gross value of construction works being executed by CPWD is estimated more than Rs. 600Crores.

21.3 LOAN FROM HEFA

Total amount of HEFA Loan sanctioned is Rs 269.41 Crores, out of which disbursement of Rs114.50Crores has been made upto 31.3.2020 against various ongoing construction projects.

21.4 PREVIOUS ASSETS, LOANS & ADVANCES

In the opinion of the Management, the previous assets, loans and advances have a realisable value in the ordinary course of transactions equal at least to the aggregate amount shown in the Balance Sheet except a few very old balances. The expenditure on renovation/ modification of buildings has been charged to Road & Buildings.

21.5 PAY AND ALLOWANCES:

As a part of implementation of accrual system of accounting the provision for salary and pension of March 2020 and few other expenditure has been made in the books of accounts as on 31.3.2020. No provisions have been made for arrears of pension.

21.6 CONSULTANCY SERVICES:

The accounting system for the consultancy services was changed during the year 2007-08. Up to 2006-07 the amount received and expenditure incurred on consultancy projects were taken into Income & Expenditure Account. From 2007-08 the amount of consultancy has been considered as liability and undisbursed amount has been shown in the Balance sheet. The amount received/ expenditure for new consultancy services and undisbursed amount of old consultancy projects have been taken into Balance Sheet.

21.7 Miscellaneous Expenditure of project, if any, was met out of interest from project investments.



21.8 DEFERRED REVENUE EXPENDITURE

Non Plan:

Prepaid Expenses standing in the Books towards maintenance charges of IIIF Building for 5 years w.e.f. 01.07.2016 has been written off by Rs 31.80 Lakhs during the current financial year and Rs. 39.75 Lakhs outstanding on 31.03.2020.

Plan:

Prepaid Expenses standing in the Books towards expense incurred on comprehensive warranty for 4yrs period w.e.f 22.11.2015 on purchase of Electron Probe Micro Analyser and for Setting up of Internet Connectivity Charges of BSNL for 10 years w.e.f. FY 2011 - 12 written off during the year amounts to Rs36.74 Lakhs and outstanding as on 31.03.2020 is nil.

- 21.9 Corresponding figures for the previous year have been regrouped / rearranged, wherever necessary and segregated to the extent possible. The variation in the previous year figures of balance sheet is due to reclassification/ segregation of ledger accounts.
- 21.10 As the Provident Fund Accounts and the New Pension Scheme Account are owned by the Members of those funds and not by the Institute, these accounts are prepared separately. However, a Receipt & Payment Account, an Income & Expenditure Account and a Balance Sheet of the same is attached to the Institute's Account.
- 21.11 The surplus funds under Project Accounts were invested in a consolidated manner, and interest income was credited to Non Plan Endowment Fund of the Institute as per the decision of the EB.
- 21.12 Schedule I to XXI are annexed to and form an integral part of the Balance Sheet and the Income & Expenditure Account for the year ended on that date.
- 21.13 Receipt & Payment has been made with the help of computerised schedules.

(Prabodh Pandey)

Dy. Registrar (F&A)/ Registrar (Actg.)

(Prof. J.K. Pattanayak)

Deputy Director

(Prof. Rajiv Shekar)

Director



UDN: 20419339AAAA BD9777



INDIAN INSTITUTE OF TECHNOLOGY (INDIAN SCHOOL OF MINES) DHANBAD

STATEMENT OF OUTSTANDING LETTERS OF CREDIT (LC) FOR THE F.Y. 2019-20							
S. No.	Purchase order No.	Name & Place of foreign supplier	Date	F.Y.	Outstanding as on 31/03/2020	CURRENCY	Bank
A. PROJECT							
1	VRMS/02	M/s SIMTARS ,Queensland Australia	23-04-19	2019-20	1,849,105.00	AUD	Canara Bank, Sdl, Dhn
2	CHEMICAL/PRJ/097/18-19	M/s Nabertherm GMBH Bremen ,Germany	09-07-19	2019-20	10,669.50	EUR	Canara Bank, Sdl, Dhn
3	M/500210/17-18	M/s PASI S.R.L. Torino ,Italy	15-10-20	2019-20	12,264.30	EUR	Canara Bank, Sdl, Dhn
4	AGL/PRJ/010/19-20	M/s Leica Mikrosysteme Vertrieb Wetzlar, Germany	23-01-20	2019-20	47,895.30	EUR	Canara Bank, Sdl, Dhn
5	ESE/500514/17-18	M/s Shimadzu (Asia Pacific) Pte Ltd, Singapore	24-01-20	2019-20	14,400.00	USD	Canara Bank, Sdl, Dhn
6	AGP/PRJ/051/19-20	M/s IRIS Instruments ,Orleans ,France	13-02-20	2019-20	60,606.00	EUR	Canara Bank, Sdl, Dhn
7	ME/PRJ/387/18-19	M/s VINCI Technologies Nanterre Cedex ,France	26-02-20	2019-20	127,620.00	EUR	Canara Bank, Sdl, Dhn
8	CHEMICAL/PRJ/050/19-20	M/s Thermo Electron Scientific Instruments Madison, USA	06-03-20	2019-20	58,398.30	USD	Canara Bank, Sdl, Dhn
9	MECH/PRJ/212/19-20	M/s Filmetrics Inc. San Diego	18-03-20	2019-20	38,466.90	USD	Canara Bank, Sdl, Dhn
10	CHEMICAL/PRJ/055/19-20	M/s Thermo Fisher Scientific Pte Ltd Singapore	19-03-20	2019-20	76,815.00	USD	Canara Bank, Sdl, Dhn
11	MECH/500174/17-18	M/s Taylor Hobson Ltd UK	07-08-18	2019-20	11,340.00	GBP	Canara Bank, Sdl, Dhn
12	CHEMICAL/PRJ/054/18-19	M/s Vision Research Inc Wayne New Jersey USA	20-08-19	2019-20	3,600.00	USD	Canara Bank, Sdl, Dhn
13	APP PHY/PRJ/385/18-19	M/s Scientec INC Ontario Canada	03-09-19	2019-20	2,713.93	USD	Canara Bank, Sdl, Dhn
14	MECH/PRJ/116/2019-20	M/s Zygo Corporation Middlefield USA	16-03-17	2019-20	128,462.40	USD	Canara Bank, Sdl, Dhn
B. PLAN							
1	CRF-/INS/193/19-20	M/s Carl Zeiss Microscopy, Germany	16-01-20	2019-20	260,550.00	EUR	State Bank of India, ISM Campus
2	CRF-/INS/326/18-19	M/s Physical Electronics , USA	24-09-19	2019-20	535,500.00	USD	State Bank of India, ISM Campus
3	CRF-/INS/155/19-20	M/s Instron- Bucks, U.K	16-01-20	2019-20	156,252.60	GBP	State Bank of India, ISM Campus



Investment under Plan as on 31.03.2020

Sl. No.	Name of Bank/ Branch Account No.	Effect. Dt.	Maturity Dt. & Period of Deposit	Principal (Rs.)	Intt. Rate (%)	Intrest (Rs.)	Maturity Value (Rs.)	Accured Interest
1	SBI, Main Branch, Bank More, Dhanbad 3563578254	12-03-19	09-03-22	6,241,101.00	6.80%	1,215,241.00	7,456,342.00	466676.07
	SBI, Main Branch, Bank More, Dhanbad 35635738389							
2		12-03-19	09-03-22	6,241,101.00	6.80%	1,215,241.00	7,456,342.00	466676.07
3	SBI, Main Branch, Bank More, Dhanbad 35635738061	12-03-19	09-03-22	6,241,101.00	6.80%	1,215,241.00	7,456,342.00	466676.07
4	SBI, Main Branch, Bank More, Dhanbad 356357 37668	12-03-19	09-03-22	6,241,101.00	6.80%	1,215,241.00	7,456,342.00	466676.07
5	SBI, Main Branch, Bank More, Dhanbad 356357 37352	12-03-19	09-03-22	6,241,101.00	6.80%	1,215,241.00	7,456,342.00	466676.07
6	SBI, Main Branch, Bank More, Dhanbad 35635736993	12-03-19	09-03-22	6,241,101.00	6.80%	1,215,241.00	7,456,342.00	466676.07
7	SBI, Main Branch, Bank More, Dhanbad 35635736675	12-03-19	09-03-22	6,241,101.00	6.80%	1,215,241.00	7,456,342.00	466676.07
8	SBI, Main Branch, Bank More, Dhanbad 35635736529	12-03-19	09-03-22	6,241,101.00	6.80%	1,215,241.00	7,456,342.00	466676.07
9	SBI, Main Branch, Bank More, Dhanbad 35635736438	12-03-19	09-03-22	6,241,101.00	6.80%	1,215,241.00	7,456,342.00	466676.07
10	SBI, Main Branch, Bank More, Dhanbad 35635735678	12-03-19	09-03-22	6,241,101.00	6.80%	1,215,241.00	7,456,342.00	466676.07
11	SBI, ISM Campus Br Acct No 39184774351	02-03-20	17-04-20	10,000,000.00	5.00%	63,014.00	10,063,014.00	41095.89
12	SBI, ISM Campus Br Acct No 39184774690	02-03-20	17-04-20	10,000,000.00	5.00%	63,014.00	10,063,014.00	41095.89
13	SBI, ISM Campus Br Acct No 39184775004	02-03-20	17-04-20	10,000,000.00	5.00%	63,014.00	10,063,014.00	41095.89
14	SBI, ISM Campus Br Acct No 39184775990	02-03-20	17-04-20	10,000,000.00	5.00%	63,014.00	10,063,014.00	41095.89
15	SBI, ISM Campus Br Acct No 39184776223	02-03-20	17-04-20	10,000,000.00	5.00%	63,014.00	10,063,014.00	41095.89
16	SBI, ISM Campus Br Acct No 39184776494	02-03-20	17-04-20	10,000,000.00	5.00%	63,014.00	10,063,014.00	41095.89
17	SBI, ISM Campus Br Acct No 39184776824	02-03-20	17-04-20	10,000,000.00	5.00%	63,014.00	10,063,014.00	41095.89
18	SBI, ISM Campus Br Acct No 39184777089	02-03-20	17-04-20	10,000,000.00	5.00%	63,014.00	10,063,014.00	41095.89
19	SBI, ISM Campus Br Acct No 39184777410	02-03-20	17-04-20	10,000,000.00	5.00%	63,014.00	10,063,014.00	41095.89
20	SBI, ISM Campus Br Acct No 39184777680	02-03-20	17-04-20	10,000,000.00	5.00%	63,014.00	10,063,014.00	41095.89
21	SBI, ISM Campus Br Acct No 39184778038	02-03-20	17-04-20	10,000,000.00	5.00%	63,014.00	10,063,014.00	41095.89
22	SBI, ISM Campus Br Acct No 39184778378	02-03-20	17-04-20	10,000,000.00	5.00%	63,014.00	10,063,014.00	41095.89
23	SBI, ISM Campus Br Acct No 39184778811	02-03-20	17-04-20	10,000,000.00	5.00%	63,014.00	10,063,014.00	41095.89
Total Investments as on 31.03.2020				192,411,010.00		Accrued Interest as on 31.03.2020		5201007.27



Investment under Non - Plan as on 31.03.2020

Sl No.	Particulars	Date of Investment	Date of Maturity	Investment Amount	Rate of Interest	Interest Amount	Maturity Value	Accrued Interest
	Following 2 nos of TDRs are pledged with SBI Spl Commercial Br, Bank More							
1	SBI, Spl Commercial Br, Bank More35635712928	12-03-19	09-03-22	919,538.00	6.80%	174,520.00	1,094,058.00	68,758.12
2	SBI, Spl Commercial Br, Bank More35635736289	12-03-19	09-03-22	1,006,864.00	6.80%	190,247.00	1,197,111.00	75,287.89
	Canara Bank saraidhella Branch 0986413000162/1 (Previously Scholarship Fund Investment which is now GIA Investment)							
3	SBI, ISM Campus Br Acct No 38422902850	23-10-15	30-04-17	2,800,055.00	7.85%		3,151,436.00	827,533.01
4	SBI, ISM Campus Br Acct No 38525154170	29-04-19	30-04-20	168,208.00	6.80%	11,767.00	179,975.00	10,807.64
5	SBI, ISM Campus Br Acct No 38525154170	13-06-19	29-11-19	7,500,000.00	6.25%	215,860.00	7,715,860.00	360,739.79
6	SBI, ISM Campus Br Acct No 38525154512	13-06-19	29-11-19	7,500,000.00	6.25%	215,860.00	7,715,860.00	360,739.79
7	SBI, ISM Campus Br Acct No 38626147919	23-07-19	31-01-20	10,000,000.00	6.35%	334,383.00	10,334,383.00	435,947.01
8	SBI, ISM Campus Br Acct No 38626145162	23-07-19	31-01-20	10,000,000.00	6.35%	334,383.00	10,334,383.00	435,947.01
9	SBI, ISM Campus Br Acct No 38626145513	23-07-19	31-01-20	10,000,000.00	6.35%	334,383.00	10,334,383.00	435,947.01
10	SBI, ISM Campus Br Acct No 38626145763	23-07-19	31-01-20	10,000,000.00	6.35%	334,383.00	10,334,383.00	435,947.01
11	SBI, ISM Campus Br Acct No 38626145369	23-07-19	31-01-20	10,000,000.00	6.35%	334,383.00	10,334,383.00	435,947.01
12	SBI, ISM Campus Br Acct No 38626146846	23-07-19	31-01-20	10,000,000.00	6.35%	334,383.00	10,334,383.00	435,947.01
13	SBI, ISM Campus Br Acct No 38626147341	23-07-19	31-01-20	10,000,000.00	6.35%	334,383.00	10,334,383.00	435,947.01
14	SBI, ISM Campus Br Acct No 38626129036	23-07-19	31-01-20	10,000,000.00	6.35%	334,383.00	10,334,383.00	435,947.01
15	Can Bank, SDL Br A/c No 0986401006166/1	18-07-19	18-07-20	246,052.00	6.70%	16,904.00	262,956.00	11,766.80
16	Can Bank, SDL Br A/c No 0986307000124/3	11-01-20	09-07-20	9,221,565.00	6.00%	270,583.00	9,492,148.00	121,762.55
17	Can Bank, SDL Br A/c No 0986307000123/3	11-01-20	09-07-20	9,539,550.00	6.00%	279,914.00	9,819,464.00	125,961.26
18	Can Bank, SDL Br A/c No 0986307000122/3	11-01-20	09-07-20	9,539,550.00	6.00%	279,914.00	9,819,464.00	125,961.26
19	Can Bank, SDL Br A/c No 0986307000121/3	11-01-20	09-07-20	9,539,550.00	6.00%	279,914.00	9,819,464.00	125,961.26



20	Can Bank, SDL Br A/c No 0986307000120/3	11-01-20	09-07-20	9,539,550.00	6.00%	279,914.00	9,819,464.00	125,961.26
21	Can Bank, SDL Br A/c No 0986307000119/3	11-01-20	09-07-20	9,539,550.00	6.00%	279,914.00	9,819,464.00	125,961.26
22	Can Bank, SDL Br A/c No 0986307000118/3	11-01-20	09-07-20	9,539,550.00	6.00%	279,914.00	9,819,464.00	125,961.26
23	Can Bank, SDL Br A/c No 0986307000117/3	11-01-20	09-07-20	9,539,550.00	6.00%	279,914.00	9,819,464.00	125,961.26
24	Can Bank, SDL Br A/c No 0986307000116/3	11-01-20	09-07-20	9,539,550.00	6.00%	279,914.00	9,819,464.00	125,961.26
25	Can Bank, SDL Br A/c No 0986307000115/3	11-01-20	09-07-20	9,539,550.00	6.00%	279,914.00	9,819,464.00	125,961.26
26	Can Bank, SDL Br A/c No 0986307000114/3	11-01-20	09-07-20	9,539,550.00	6.00%	279,914.00	9,819,464.00	125,961.26
27	Can Bank, SDL Br A/c No 0986307000113/3	11-01-20	09-07-20	9,539,550.00	6.00%	279,914.00	9,819,464.00	125,961.26
28	Can Bank, SDL Br A/c No 0986307000112/3	11-01-20	09-07-20	9,539,550.00	6.00%	279,914.00	9,819,464.00	125,961.26
29	Can Bank, SDL Br A/c No 0986307000111/3	11-01-20	09-07-20	9,539,550.00	6.00%	279,914.00	9,819,464.00	125,961.26
30	Can Bank, SDL Br A/c No 0986307000110/3	11-01-20	09-07-20	9,539,550.00	6.00%	279,914.00	9,819,464.00	125,961.26
31	SBI, ISM Campus Br Acct No 38885741268	31-10-19	31-12-19	7,500,000.00	5.50%	68,938.00	7,568,938.00	170,847.87
32	SBI, ISM Campus Br Acct No 38885741360	31-10-19	31-12-19	7,500,000.00	5.50%	68,938.00	7,568,938.00	170,847.87
33	SBI, ISM Campus Br Acct No 38885741484	31-10-19	31-12-19	7,500,000.00	5.50%	68,938.00	7,568,938.00	170,847.87
34	SBI, ISM Campus Br Acct No 38885741575	31-10-19	31-12-19	7,500,000.00	5.50%	68,938.00	7,568,938.00	170,847.87
35	SBI, ISM Campus Br Acct No 38885741734	31-10-19	31-12-19	7,500,000.00	5.50%	68,938.00	7,568,938.00	170,847.87
36	SBI, ISM Campus Br Acct No 38885741858	31-10-19	31-12-19	7,500,000.00	5.50%	68,938.00	7,568,938.00	170,847.87
37	SBI, ISM Campus Br Acct No 38885741961	31-10-19	31-12-19	7,500,000.00	5.50%	68,938.00	7,568,938.00	170,847.87
38	SBI, ISM Campus Br Acct No 38885742046	31-10-19	31-12-19	7,500,000.00	5.50%	68,938.00	7,568,938.00	170,847.87
39	SBI, ISM Campus Br Acct No 38888802876	01-11-19	01-01-20	7,500,000.00	5.50%	68,938.00	7,568,938.00	169,801.66
40	SBI, ISM Campus Br Acct No 38888802082	01-11-19	01-01-20	7,500,000.00	5.50%	68,938.00	7,568,938.00	169,801.66
41	SBI, ISM Campus Br Acct No 38918859936	13-11-19	10-01-20	7,500,000.00	5.50%	65,548.00	7,565,548.00	156,759.42
42	SBI, ISM Campus Br Acct No 38918860282	13-11-19	10-01-20	7,500,000.00	5.50%	65,548.00	7,565,548.00	156,759.42
43	SBI, ISM Campus Br Acct No 38918860690	13-11-19	10-01-20	7,500,000.00	5.50%	65,548.00	7,565,548.00	156,759.42
44	SBI, ISM Campus Br Acct No 38918860941	13-11-19	10-01-20	7,500,000.00	5.50%	65,548.00	7,565,548.00	156,759.42
45	SBI, ISM Campus Br Acct No 38918861173	13-11-19	31-01-20	5,000,000.00	5.50%	59,521.00	5,059,521.00	106,027.08
46	SBI, ISM Campus Br Acct No 38918861311	13-11-19	31-01-20	5,000,000.00	5.50%	59,521.00	5,059,521.00	106,027.08
47	SBI, ISM Campus Br Acct No 38918861774	13-11-19	31-01-20	5,000,000.00	5.50%	59,521.00	5,059,521.00	106,027.08
48	SBI, ISM Campus Br Acct No 38918862042	13-11-19	31-01-20	5,000,000.00	5.50%	59,521.00	5,059,521.00	106,027.08
49	SBI, ISM Campus Br Acct No 38918862542	13-11-19	10-03-20	7,500,000.00	5.50%	132,509.00	7,632,509.00	155,078.24
50	SBI, ISM Campus Br Acct No 38918862938	13-11-19	10-03-20	7,500,000.00	5.50%	132,509.00	7,632,509.00	155,078.24
51	SBI, ISM Campus Br Acct No 38918863363	13-11-19	10-03-20	7,500,000.00	5.50%	132,509.00	7,632,509.00	155,078.24



52	SBI, ISM Campus Br Acct No 38918863726	13-11-19	10-03-20	7,500,000.00	5.50%	132,509.00	7,632,509.00	155,078.24
53	SBI, ISM Campus Br Acct No 38918863997	13-11-19	10-03-20	7,500,000.00	5.50%	132,509.00	7,632,509.00	155,078.24
54	SBI, ISM Campus Br Acct No 38918984344	13-11-19	10-03-20	7,500,000.00	5.50%	132,509.00	7,632,509.00	155,078.24
55	SBI, ISM Campus Br Acct No 38918984627	13-11-19	10-03-20	7,500,000.00	5.50%	132,509.00	7,632,509.00	155,078.24
56	SBI, ISM Campus Br Acct No 38980508017	06-12-19	30-04-20	7,500,000.00	5.50%	164,623.00	7,664,623.00	131,955.65
57	SBI, ISM Campus Br Acct No 38980514361	06-12-19	30-04-20	7,500,000.00	5.50%	164,623.00	7,664,623.00	131,955.65
58	SBI, ISM Campus Br Acct No 38980514611	06-12-19	30-04-20	7,500,000.00	5.50%	164,623.00	7,664,623.00	131,955.65
59	SBI, ISM Campus Br Acct No 38980514826	06-12-19	30-04-20	7,500,000.00	5.50%	164,623.00	7,664,623.00	131,955.65
60	SBI, ISM Campus Br Acct No 38980515127	06-12-19	30-04-20	7,500,000.00	5.50%	164,623.00	7,664,623.00	131,955.65
61	SBI, ISM Campus Br Acct No 38980515376	06-12-19	30-04-20	7,500,000.00	5.50%	164,623.00	7,664,623.00	131,955.65
62	SBI, ISM Campus Br Acct No 38980515525	06-12-19	30-04-20	7,500,000.00	5.50%	164,623.00	7,664,623.00	131,955.65
63	SBI, ISM Campus Br Acct No 38980515693	06-12-19	30-04-20	7,500,000.00	5.50%	164,623.00	7,664,623.00	131,955.65
64	SBI, ISM Campus Br Acct No 38980515875	06-12-19	30-04-20	7,500,000.00	5.50%	164,623.00	7,664,623.00	131,955.65
65	SBI, ISM Campus Br Acct No 38980516062	06-12-19	30-04-20	7,500,000.00	5.50%	164,623.00	7,664,623.00	131,955.65
66	SBI, ISM Campus Br Acct No 38980516277	06-12-19	30-04-20	7,500,000.00	5.50%	164,623.00	7,664,623.00	131,955.65
67	SBI, ISM Campus Br Acct No 38980516493	06-12-19	30-04-20	7,500,000.00	5.50%	164,623.00	7,664,623.00	131,955.65
68	SBI, ISM Campus Br Acct No 38980511100	06-12-19	29-05-20	7,500,000.00	5.50%	197,868.00	7,697,868.00	131,955.65
69	SBI, ISM Campus Br Acct No 38980516721	06-12-19	29-05-20	7,500,000.00	5.50%	197,868.00	7,697,868.00	131,955.65
70	SBI, ISM Campus Br Acct No 38980517011	06-12-19	29-05-20	7,500,000.00	5.50%	197,868.00	7,697,868.00	131,955.65
71	SBI, ISM Campus Br Acct No 38980517408	06-12-19	29-05-20	7,500,000.00	5.50%	197,868.00	7,697,868.00	131,955.65
72	SBI, ISM Campus Br Acct No 38980517838	06-12-19	29-05-20	7,500,000.00	5.50%	197,868.00	7,697,868.00	131,955.65
73	SBI, ISM Campus Br Acct No 38980518184	06-12-19	29-05-20	7,500,000.00	5.50%	197,868.00	7,697,868.00	131,955.65
74	SBI, ISM Campus Br Acct No 38980518366	06-12-19	29-05-20	7,500,000.00	5.50%	197,868.00	7,697,868.00	131,955.65
75	SBI, ISM Campus Br Acct No 38980518571	06-12-19	29-05-20	7,500,000.00	5.50%	197,868.00	7,697,868.00	131,955.65
76	SBI, ISM Campus Br Acct No 38980518945	06-12-19	29-05-20	7,500,000.00	5.50%	197,868.00	7,697,868.00	131,955.65
77	SBI, ISM Campus Br Acct No 38980519029	06-12-19	29-05-20	7,500,000.00	5.50%	197,868.00	7,697,868.00	131,955.65
78	SBI, ISM Campus Br Acct No 38980519234	06-12-19	29-05-20	7,500,000.00	5.50%	197,868.00	7,697,868.00	131,955.65
79	SBI, ISM Campus Br Acct No 38980518785	06-12-19	29-05-20	7,500,000.00	5.50%	197,868.00	7,697,868.00	131,955.65
80	SBI, ISM Campus Br Acct No 39004593043	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
81	SBI, ISM Campus Br Acct No 39004746127	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
82	SBI, ISM Campus Br Acct No 39004746218	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
83	SBI, ISM Campus Br Acct No 39004746274	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65



84	SBI, ISM Campus Br Acct No 39004744845	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
85	SBI, ISM Campus Br Acct No 39004744890	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
86	SBI, ISM Campus Br Acct No 39004744947	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
87	SBI, ISM Campus Br Acct No 39004744992	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
88	SBI, ISM Campus Br Acct No 39004745044	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
89	SBI, ISM Campus Br Acct No 39004745055	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
90	SBI, ISM Campus Br Acct No 39004745102	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
91	SBI, ISM Campus Br Acct No 39004745146	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
92	SBI, ISM Campus Br Acct No 39004745179	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
93	SBI, ISM Campus Br Acct No 39004745248	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
94	SBI, ISM Campus Br Acct No 39004745293	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
95	SBI, ISM Campus Br Acct No 39004745351	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
96	SBI, ISM Campus Br Acct No 39004745395	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
97	SBI, ISM Campus Br Acct No 39004745475	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
98	SBI, ISM Campus Br Acct No 39004762401	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
99	SBI, ISM Campus Br Acct No 39004762467	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
100	SBI, ISM Campus Br Acct No 39004762592	17-12-19	01-02-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	118,916.65
101	SBI, ISM Campus Br Acct No 39063369465	10-12-19	26-02-20	7,500,000.00	5.50%	53,116.00	7,553,116.00	89,329.57
102	SBI, ISM Campus Br Acct No 39063371429	10-12-19	26-02-20	7,500,000.00	5.50%	53,116.00	7,553,116.00	89,329.57
103	SBI, ISM Campus Br Acct No 39063371724	10-12-19	26-02-20	7,500,000.00	5.50%	53,116.00	7,553,116.00	89,329.57
104	SBI, ISM Campus Br Acct No 39063371939	10-12-19	26-02-20	7,500,000.00	5.50%	53,116.00	7,553,116.00	89,329.57
105	SBI, ISM Campus Br Acct No 39114471407	03-02-20	20-03-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	64,400.22
106	SBI, ISM Campus Br Acct No 39114471270	03-02-20	20-03-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	64,400.22
107	SBI, ISM Campus Br Acct No 39114471167	03-02-20	20-03-20	7,500,000.00	5.50%	51,986.00	7,551,986.00	64,400.22
108	SBI, ISM Campus Br Acct No 39114469238	03-02-20	18-02-20	7,500,000.00	5.50%	13,870.00	7,513,870.00	52,431.32
109	SBI, ISM Campus Br Acct No 39114469498	03-02-20	18-02-20	7,500,000.00	5.50%	13,870.00	7,513,870.00	52,431.32
110	SBI, ISM Campus Br Acct No 39114469464	03-02-20	18-02-20	7,500,000.00	5.50%	13,870.00	7,513,870.00	52,431.32
111	SBI, ISM Campus Br Acct No 39114469873	03-02-20	18-02-20	7,500,000.00	5.50%	13,870.00	7,513,870.00	52,431.32
112	SBI, ISM Campus Br Acct No 39114470061	03-02-20	18-02-20	7,500,000.00	5.50%	13,870.00	7,513,870.00	52,431.32
113	SBI, ISM Campus Br Acct No 39114470312	03-02-20	18-02-20	7,500,000.00	5.50%	13,870.00	7,513,870.00	52,431.32
114	SBI, ISM Campus Br Acct No 39117395567	04-02-20	21-03-20	10,000,000.00	5.50%	69,315.00	10,069,315.00	84,487.94
115	SBI, ISM Campus Br Acct No 39158962120	20-02-20	30-06-20	10,000,000.00	5.00%	180,365.00	10,180,365.00	57,795.70



116	SBI, ISM Campus Br Acct No 39158959093	20-02-20	30-06-20	10,000,000.00	5.00%	180,365.00	10,180,365.00	57,795.70
117	SBI, ISM Campus Br Acct No 39158960575	20-02-20	30-06-20	10,000,000.00	5.00%	180,365.00	10,180,365.00	57,795.70
118	SBI, ISM Campus Br Acct No 39158960949	20-02-20	30-06-20	10,000,000.00	5.00%	180,365.00	10,180,365.00	57,795.70
119	SBI, ISM Campus Br Acct No 39158961273	20-02-20	30-06-20	10,000,000.00	5.00%	180,365.00	10,180,365.00	57,795.70
120	SBI, ISM Campus Br Acct No 39158961422	20-02-20	30-06-20	10,000,000.00	5.00%	180,365.00	10,180,365.00	57,795.70
121	SBI, ISM Campus Br Acct No 39158961807	20-02-20	30-06-20	10,000,000.00	5.00%	180,365.00	10,180,365.00	57,795.70
122	SBI, ISM Campus Br Acct No 39184782067	02-03-20	17-03-20	7,500,000.00	4.50%	13,870.00	7,513,870.00	25,398.53
123	SBI, ISM Campus Br Acct No 39184782261	02-03-20	17-03-20	7,500,000.00	4.50%	13,870.00	7,513,870.00	25,398.53
124	SBI, ISM Campus Br Acct No 39184781518	02-03-20	17-03-20	7,500,000.00	4.50%	13,870.00	7,513,870.00	25,398.53
Total of FDR Face Value as on 31.03.2020				957,915,982.00		Accrued Interest as on 31.03.2020		18,026,054.70



**INDIAN INSTITUTE OF TECHNOLOGY(INDIAN SCHOOL OF MINES, DHANBAD
SCHEDULE OF ISM NON-PLAN ENDOWMENT FUND INVESTMENTS AS ON 31.03.2020**

Sl. No.	Name of Bank/Branch Account No.	Effect. Date	Maturity Dt. & Period of Deposit	Principal (Rs.)	Intt. Rate %	Interest Amount	Maturity Value (Rs.)	Accrued Interest
1	2	3	4	5	6	7	8	9
1.00	Investments maturing during the F. Y. 2019-20 :-							
1.01	State Bank of India, SPL Branch, Bank More, Dhanbad 36228331370	03-11-16	03-10-19	5,000,000.00	7.00%	1,122,091.00	6,122,091.00	1,312,765.77
1.02	State Bank of India, SPL Branch, Bank More, Dhanbad 36228354434	03-11-16	03-10-19	5,000,000.00	7.00%	1,122,091.00	6,122,091.00	1,312,765.77
1.03	State Bank of India, SPL Branch, Bank More, Dhanbad 36228352120	03-11-16	03-10-19	5,000,000.00	7.00%	1,122,091.00	6,122,091.00	1,312,765.77
1.04	State Bank of India, SPL Branch, Bank More, Dhanbad 36228351692	03-11-16	03-10-19	5,000,000.00	7.00%	1,122,091.00	6,122,091.00	1,312,765.77
1.05	State Bank of India, SPL Branch, Bank More, Dhanbad 36228351397	03-11-16	03-10-19	5,000,000.00	7.00%	1,122,091.00	6,122,091.00	1,312,765.77
1.06	State Bank of India, SPL Branch, Bank More, Dhanbad 36228346149	03-11-16	03-10-19	5,000,000.00	7.00%	1,122,091.00	6,122,091.00	1,312,765.77
1.07	State Bank of India, SPL Branch, Bank More, Dhanbad 36228345725	03-11-16	03-10-19	5,000,000.00	7.00%	1,122,091.00	6,122,091.00	1,312,765.77
			Sub Total	35,000,000.00				9,189,360.39



Investments maturing during the F. Y. 2020-21 :-									
2.00	SBI, ISM Campus Branch								
2.01	37688673888	05-05-19	05-05-20	21,437,181.00	6.70%	1,472,783.00	22,909,964.00	1330201.669	
2.02	SBI, ISM Campus Branch								
	37688674688	05-05-19	05-05-20	21,437,181.00	6.70%	1,472,783.00	22,909,964.00	1330201.669	
2.03	SBI, ISM Campus Branch								
	37688675321	05-05-19	05-05-20	21,437,181.00	6.70%	1,472,783.00	22,909,964.00	1330201.669	
2.04	SBI, ISM Campus Branch								
	37688675900	05-05-19	05-05-20	21,437,181.00	6.70%	1,472,783.00	22,909,964.00	1330201.669	
2.05	SBI, ISM Campus Branch								
	37688681415	05-05-19	05-05-20	21,437,181.00	6.70%	1,472,783.00	22,909,964.00	1330201.669	
2.06	SBI, ISM Campus Branch								
	37688681878	05-05-19	05-05-20	21,437,181.00	6.70%	1,472,783.00	22,909,964.00	1330201.669	
2.07	SBI, ISM Campus Branch								
	37688682577	05-05-19	05-05-20	21,437,181.00	6.70%	1,472,783.00	22,909,964.00	1330201.669	
2.08	SBI, ISM Campus Branch								
	37688682872	05-05-19	05-05-20	21,437,181.00	6.70%	1,472,783.00	22,909,964.00	1330201.669	
2.09	Canara Bank, Seraidhela Branch								
	0986401006338/8	27-01-20	27-01-21	5,000,000.00	6.30%	322,520.00	5,322,520.00	56,000.00	
2.1	Canara Bank, Seraidhela Branch								
	0986401006338/7	27-01-20	27-01-21	10,000,000.00	6.30%	645,041.00	10,645,041.00	112,000.00	
2.11	Canara Bank, Seraidhela Branch								
	0986401006338/6	27-01-20	27-01-21	10,000,000.00	6.30%	645,041.00	10,645,041.00	112,000.00	
2.12	Canara Bank, Seraidhela Branch								
	0986401006338/5	27-01-20	27-01-21	10,000,000.00	6.30%	645,041.00	10,645,041.00	112,000.00	
2.13	Canara Bank, Seraidhela Branch								
	0986401006338/4	27-01-20	27-01-21	10,000,000.00	6.30%	645,041.00	10,645,041.00	112,000.00	
2.14	Canara Bank, Seraidhela Branch								
	0986401006338/3	27-01-20	27-01-21	10,000,000.00	6.30%	645,041.00	10,645,041.00	112,000.00	
2.15	Canara Bank, Seraidhela Branch								
	0986401006338/2	27-01-20	27-01-21	10,000,000.00	6.30%	645,041.00	10,645,041.00	112,000.00	
2.16	Canara Bank, Seraidhela Branch								
	0986401006338/1	27-01-20	27-01-21	10,000,000.00	6.30%	645,041.00	10,645,041.00	112,000.00	
2.17	Indian Bank Bank More Branch								
	6853149899	24-01-20	24-01-21	19,500,000.00	6.40%	1,278,273.00	20,778,273.00	233,142.85	



2.18	Indian Bank Bank More Branch 6853149866	24-01-20	24-01-21	19,500,000.00	6.40%	1,278,273.00	20,778,273.00	233,142.85
2.19	Indian Bank Bank More Branch 6853668383	27-01-20	27-01-21	19,500,000.00	6.40%	1,278,273.00	20,778,273.00	222,857.15
2.2	Indian Bank Bank More Branch 6853669115	27-01-20	27-01-21	19,500,000.00	6.40%	1,278,273.00	20,778,273.00	222,857.15
	Sub Total			324,497,448.00				12,393,613.35
3.00	Investments maturing during the F. Y. 2022-23 :-							
3.01	PNB Housing Finance Limited, Kolkata 1153000110312873	28-10-19	28-10-22	3,069,121.00	8.25%	830,830.00	3,899,951.00	108,218.00
3.02	PNB Housing Finance Limited, Kolkata 1153000110312872	28-10-19	28-10-22	20,000,000.00	8.25%	5,414,125.00	25,414,125.00	705,205.00
3.03	PNB Housing Finance Limited, Kolkata 1153000110312870	28-10-19	28-10-22	20,000,000.00	8.25%	5,414,125.00	25,414,125.00	705,205.00
3.04	PNB Housing Finance Limited, Kolkata 1153000110312974	07-11-19	07-11-22	18,047,800.00	8.25%	4,884,962.00	22,932,762.00	595,577.00
3.05	PNB Housing Finance Limited, Kolkata 1153000110312973	07-11-19	07-11-22	20,000,000.00	8.25%	5,414,125.00	25,414,125.00	660,000.00
3.06	PNB Housing Finance Limited, Kolkata 1153000110312972	07-11-19	07-11-22	20,000,000.00	8.25%	5,414,125.00	25,414,125.00	660,000.00
3.07	LIC Housing Finance Limited, Mumbai 635571 Folio No: 0055581	28-10-19	28-10-22	100,000,000.00	7.60%	24,580,000.00	124,580,000.00	3,294,634.04
	Sub Total			201,116,921.00				6,728,839.04
	Total of FDR Face Value as on 31.03.2020			560,614,369.00		Accrued Interest as on 31.03.2020		28,311,812.78



SCHEDULE OF ISM SCHOLARSHIP FUND (N.PLAN) INVESTMENTS AS ON 31.03.2020

Sl. No.	Name of Bank/Branch Account No.	Effect. Date & FDR/TDR No.	Maturity Dt. & Period of Deposit	Principal (Rs.)	Intt. Rate %	Interest (Rs.)	Maturity Value (Rs.)	Accrued Interest
A	B	C	D	E	F	G	H	I
1.00	ISS Scholarship Fund Investment:							
1.01	Canara Bank, SDL 0986413000167/3	13-11-18	21-05-20	81,980.00	7.10%	Maturity	91,240.00	8,488.66
1.02	SBI, ISM Campus Br 384228996131	29-04-19	30-04-20	310,581.00	6.80%	21,726.00	332,307.00	19,955.34
			Total	392,561.00				28,443.99
2.00	ISM Basant Scholarship fund Investment:							
2.01	SBI, ISM Campus Br 384228989344	29-04-19	30-04-20	142,373.00	6.80%	9,959.00	152,332.00	9,147.70
3.00	V.M.Salgaocar Memorial Scholarship Fund Investment:							
3.01	SBI, ISM Campus Br, Dhanbad; A/c No. 33985649818	19-06-17	19-06-20	125,000.00	8.75%	Yearly Intt.	125,000.00	6,240.53
4.00	Budhwanti Mrig Memorial Scholarship fund Investment							
4.01	Canara Bank, SDL 0986413000166/3	13-11-18	21-05-20	2,787.00	7.10%	Maturity	3,103.00	288.58
4.02	SBI, ISM Campus Br, Dhanbad; A/c No. 38430499814	30-04-19	05-05-20	9,131,167.00	6.80%	638,753.00	9,769,920.00	584,898.11
				9,133,954.00				585,186.69
5.00	J M Dhawan Memorial Sch. Ship fund Investment							
5.01	SBI, ISM Campus Br, Dhanbad; A/c No: 38422902850	29-04-19	30-04-20	142,373.00	6.80%	9,959.00	152,332.00	9,147.70
6.00	ISM ALUMNI ASSOCIATION:							
6.01	Bank of India, ISM Branch Dhanbad 587243710000026	06-04-19	06-04-22	2,000,000.00	6.50%	32,500.00 Qty	2,000,000.00	3,226.48
7.00	ISHAN Ranbarshi Merit Scholarship							
7.01	Canara Bank, SDL, ISHAN RAJBANSHI MERIT SCHOLARSHIP 0986413000031/5	12-03-20	18-09-21	880,584.00	6.00%	MATURITY	964,053.00	2,316.07
Total of FDR Face Value as on 31.03.2020				12,816,845.00		Accrued Interest as on 31.03.2020		643,709.15



Statement of Provident Fund Investments as on 31-03-2020										
	Name of Bank/Branch Account No.	Effect. Dt. & FDR/TDR No.	Maturity Dt. & Period of Deposit	Principal (Rs.)	Intt. Rate %	Interest (Rs.)	Maturity Value (Rs.)	Accrued Interest	Accrued Interest	Accrued Interest
1	2	3	4	5	6	7	8			9
A	Long Term Investments:									
1.00 Investments under SBI - Special Deposit Scheme :-										
1.01	SBI, ISM Campus Br, Dhanbad	10.02.1976	A/c No. SP 4/01 Pass book	41,689,045.00	8%	Yearly Intt. on 1st January	41,689,045.00	843,138.19	843,138.11	
1.02	SBI, Jagjeevan Nagar Br., Dhanbad	01.04.1988	A/c No. SDS - 01 Pass book	212,500.00	8%	- do -	212,500.00	4,297.70	4,297.62	
	Sub-total	2 Nos.		41,901,545.00				847,435.89	847,435.73	
5.00 Investments maturing during the F. Y. 2019-20 :-										
5.15	Canara Bank Saraidhella 0986413000294/1 555 days	04-07-18	07-03-20	6,000,000.00	7.10%	677,752.00	6,677,752.00	325,204.68	705,194.82	
5.16	Canara Bank Saraidhella 0986413000298/1 555 days	04-07-18	07-03-20	6,000,000.00	7.10%	677,752.00	6,677,752.00	325,204.68	705,194.82	
5.17	Canara Bank Saraidhella 0986413000297/1 555 days	04-07-18	07-03-20	6,000,000.00	7.10%	677,752.00	6,677,752.00	325,204.68	705,194.82	
5.18	Canara Bank Saraidhella 0986413000296/1 555 days	04-07-18	07-03-20	6,000,000.00	7.10%	677,752.00	6,677,752.00	325,204.68	705,194.82	
5.19	Canara Bank Saraidhella 0986413000295/1 555 days	04-07-18	07-03-20	6,000,000.00	7.10%	677,752.00	6,677,752.00	325,204.68	705,194.82	
5.20	Canara Bank Saraidhella 0986413000293/1 555 days	04-07-18	07-03-20	6,000,000.00	7.10%	677,752.00	6,677,752.00	325,204.68	705,194.82	
5.21	Canara Bank Saraidhella 0986413000292/1 555 days	04-07-18	07-03-20	6,000,000.00	7.10%	677,752.00	6,677,752.00	325,204.68	705,194.82	
5.56	State Bank of India (ISM Campus Branch) 38729267412	31-08-19	29-03-20	6,748,118.00	6.00%	237,103.00	6,985,221.00		239950.00	
5.68	SBI, ISM Campus Br, Dhanbad 39099209238	27-01-20	13-03-2020	5,000,000.00	5.50%	AUTO RENEW	5,034,658.00		47761.90	
5.69	SBI, ISM Campus Br, Dhanbad 39099209001	27-01-20	13-03-2020	5,000,000.00	5.50%	AUTO RENEW	5,034,658.00		47761.90	
5.70	SBI, ISM Campus Br, Dhanbad 39099208756	27-01-20	13-03-2020	5,000,000.00	5.50%	AUTO RENEW	5,034,658.00		47761.90	
5.71	SBI, ISM Campus Br, Dhanbad 39099208484	27-01-20	13-03-2020	5,000,000.00	5.50%	AUTO RENEW	5,034,658.00		47761.90	
5.72	SBI, ISM Campus Br, Dhanbad 39099208235	27-01-20	13-03-2020	5,000,000.00	5.50%	AUTO RENEW	5,034,658.00		47761.90	
5.73	SBI, ISM Campus Br, Dhanbad 39116994287	04-02-20	21-03-2020	4,000,000.00	5.50%	AUTO RENEW	4,027,726.00		33795.00	
	Sub-total			77,748,118.00				2,276,432.75	5,448,918.24	



6.00 Investments maturing during the F. Y. 2020-21:-												
6.01	Union Bank of India, DGMS Branch A/c No. 529003030047212	19-08-13	19.03.2021	9,500,000.00	9.25%	Maturity	18,995,701.00	6,491,060.03	7897572.00			
6.02	Union Bank of India, DGMS Branch A/c No. 529003030047213	19-08-13	19.03.2021	9,600,000.00	9.25%	Maturity	19,195,656.00	6,559,386.98	7980704.00			
6.03	Union Bank of India, DGMS Branch A/c No. 529003030047210	19-08-13	19.03.2021	9,500,000.00	9.25%	Maturity	18,995,701.00	6,491,060.03	7897572.00			
6.04	Union Bank of India, DGMS Branch A/c No. 529003030047211	19-08-13	19.03.2021	9,500,000.00	9.25%	Maturity	18,995,701.00	6,491,060.03	7897572.00			
6.05	Union Bank of India, Bank More A/c No. 303/225633	21-10-13	21.05.2021	8,000,000.00	9.25%	Maturity	16,004,431.00	5,252,369.84	6421615.00			
6.06	Union Bank of India, Bank More A/c No. 303/225634	21-10-13	21.05.2021	8,144,641.00	9.25%	Maturity	16,293,793.00	5,347,333.35	6537719.00			
6.07	Union Bank of India, Bank More A/c No. 303/225641	21-10-13	21.05.2021	8,000,000.00	9.25%	Maturity	16,004,431.00	5,252,369.84	6421615.00			
6.08	Canara Bank, Saraidhela A/c no. 0986401006335/20	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.09	Canara Bank, Saraidhela A/c no. 0986401006335/19	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.10	Canara Bank, Saraidhela A/c no. 0986401006335/18	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.11	Canara Bank, Saraidhela A/c no. 0986401006335/17	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.12	Canara Bank, Saraidhela A/c no. 0986401006335/16	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.13	Canara Bank, Saraidhela A/c no. 0986401006335/15	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.14	Canara Bank, Saraidhela A/c no. 0986401006335/14	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.15	Canara Bank, Saraidhela A/c no. 0986401006335/13	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.16	Canara Bank, Saraidhela A/c no. 0986401006335/12	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.17	Canara Bank, Saraidhela A/c no. 0986401006335/11	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.18	Canara Bank, Saraidhela A/c no. 0986401006335/10	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.19	Canara Bank, Saraidhela A/c no. 0986401006335/9	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.20	Canara Bank, Saraidhela A/c no. 0986401006335/8	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.21	Canara Bank, Saraidhela A/c no. 0986401006335/7	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.22	Canara Bank, Saraidhela A/c no. 0986401006335/6	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.23	Canara Bank, Saraidhela A/c no. 0986401006335/5	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.24	Canara Bank, Saraidhela A/c no. 0986401006335/4	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.25	Canara Bank, Saraidhela A/c no. 0986401006335/3	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.26	Canara Bank, Saraidhela A/c no. 0986401006335/2	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.27	Canara Bank, Saraidhela A/c no. 0986401006335/1	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00		112500.00			
6.28	SBI, ISM CAMPUS A/c no. -39134937566	11-02-20	10-08-2020	5,000,000.00	5.50%	Maturity	5,138,254.00		38194.44			
6.12				267,244,641.00				41,884,640.11	53,342,563.44			



Statement of Provident Fund Investments as on 31-03-2020									
	Name of Bank/Branch Account No.	Effect. Dt. & FDR/TDR No.	Maturity Dt. & Period of Deposit	Principle (Rs.)	Intt. Rate %	Interest (Rs.)	Maturity Value (Rs.)	Accrued Interest	
1	2	3	4	5	6	7	8	9	
A	Long Term Investments:								
1.00 Investments under SBI - Special Deposit Scheme :-									
1.01	SBI, ISM Campus Br, Dhanbad	10.02.1976	A/c No. SP 4/01 Pass book	41,689,045.00	8%	Yearly Intt. on 1st January	41,689,045.00	843,138.11	
1.02	SBI, Jagjeevan Nagar Br., Dhanbad	01.04.1988	A/c No. SDS - 01 Pass book	212,500.00	8%	- do -	212,500.00	4,297.62	
	Sub-total	2 Nos.		41,901,545.00				847,435.73	
5.00 Investments maturing during the F. Y. 2019-20 :-									
5.15	Canara Bank Saraidhella 09866413000294/1 555 days	04-07-18	07-03-20	6,000,000.00	7.10%	677,752.00	6,677,752.00	705194.82	
5.16	Canara Bank Saraidhella 09866413000298/1 555 days	04-07-18	07-03-20	6,000,000.00	7.10%	677,752.00	6,677,752.00	705194.82	
5.17	Canara Bank Saraidhella 09866413000297/1 555 days	04-07-18	07-03-20	6,000,000.00	7.10%	677,752.00	6,677,752.00	705194.82	
5.18	Canara Bank Saraidhella 09866413000296/1 555 days	04-07-18	07-03-20	6,000,000.00	7.10%	677,752.00	6,677,752.00	705194.82	
5.19	Canara Bank Saraidhella 09866413000295/1 555 days	04-07-18	07-03-20	6,000,000.00	7.10%	677,752.00	6,677,752.00	705194.82	
5.20	Canara Bank Saraidhella 09866413000293/1 555 days	04-07-18	07-03-20	6,000,000.00	7.10%	677,752.00	6,677,752.00	705194.82	
5.21	Canara Bank Saraidhella 09866413000292/1 555 days	04-07-18	07-03-20	6,000,000.00	7.10%	677,752.00	6,677,752.00	705194.82	
5.56	State Bank of India (ISM Campus Branch) 38729267412	31-08-19	29-03-20	6,748,118.00	6.00%	237,103.00	6,985,221.00	239950.00	
5.68	SBI, ISM Campus Br, Dhanbad 39099209238	27-01-20	13-03-2020	5,000,000.00	5.50%	AUTO RENEW	5,034,658.00	47761.90	
5.69	SBI, ISM Campus Br, Dhanbad 39099209001	27-01-20	13-03-2020	5,000,000.00	5.50%	AUTO RENEW	5,034,658.00	47761.90	
5.70	SBI, ISM Campus Br, Dhanbad 39099208756	27-01-20	13-03-2020	5,000,000.00	5.50%	AUTO RENEW	5,034,658.00	47761.90	
5.71	SBI, ISM Campus Br, Dhanbad 39099208484	27-01-20	13-03-2020	5,000,000.00	5.50%	AUTO RENEW	5,034,658.00	47761.90	
5.72	SBI, ISM Campus Br, Dhanbad 39099208235	27-01-20	13-03-2020	5,000,000.00	5.50%	AUTO RENEW	5,034,658.00	47761.90	
5.73	SBI, ISM Campus Br, Dhanbad 39116994287	04-02-20	21-03-2020	4,000,000.00	5.50%	AUTO RENEW	4,027,726.00	33795.00	
	Sub-total			77,748,118.00				5,448,918.24	



6.00 Investments maturing during the F. Y. 2020-21:-

6.01	Union Bank of India, DGMS Branch A/c No. 529003030047212	19-08-13	19.03.2021	9,500,000.00	9.25%	Maturity	18,995,701.00	7897572.00
6.02	Union Bank of India, DGMS Branch A/c No. 529003030047213	19-08-13	19.03.2021	9,600,000.00	9.25%	Maturity	19,195,656.00	7980704.00
6.03	Union Bank of India, DGMS Branch A/c No. 529003030047210	19-08-13	19.03.2021	9,500,000.00	9.25%	Maturity	18,995,701.00	7897572.00
6.04	Union Bank of India, DGMS Branch A/c No. 529003030047211	19-08-13	19.03.2021	9,500,000.00	9.25%	Maturity	18,995,701.00	7897572.00
6.05	Union Bank of India, Bank More, A/c No. 303/225633	21-10-13	21.05.2021	8,000,000.00	9.25%	Maturity	16,004,431.00	6421615.00
6.06	Union Bank of India, Bank More, A/c No. 303/225634	21-10-13	21.05.2021	8,144,641.00	9.25%	Maturity	16,293,793.00	6537719.00
6.07	Union Bank of India, Bank More, A/c No. 303/225641	21-10-13	21.05.2021	8,000,000.00	9.25%	Maturity	16,004,431.00	6421615.00
6.08	Canara Bank, Saraidheha A/c no. 0986401006335/20	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.09	Canara Bank, Saraidheha A/c no. 0986401006335/19	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.10	Canara Bank, Saraidheha A/c no. 0986401006335/18	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.11	Canara Bank, Saraidheha A/c no. 0986401006335/17	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.12	Canara Bank, Saraidheha A/c no. 0986401006335/16	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.13	Canara Bank, Saraidheha A/c no. 0986401006335/15	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.14	Canara Bank, Saraidheha A/c no. 0986401006335/14	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.15	Canara Bank, Saraidheha A/c no. 0986401006335/13	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.16	Canara Bank, Saraidheha A/c no. 0986401006335/12	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.17	Canara Bank, Saraidheha A/c no. 0986401006335/11	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.18	Canara Bank, Saraidheha A/c no. 0986401006335/10	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.19	Canara Bank, Saraidheha A/c no. 0986401006335/9	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.20	Canara Bank, Saraidheha A/c no. 0986401006335/8	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.21	Canara Bank, Saraidheha A/c no. 0986401006335/7	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.22	Canara Bank, Saraidheha A/c no. 0986401006335/6	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.23	Canara Bank, Saraidheha A/c no. 0986401006335/5	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.24	Canara Bank, Saraidheha A/c no. 0986401006335/4	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.25	Canara Bank, Saraidheha A/c no. 0986401006335/3	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.26	Canara Bank, Saraidheha A/c no. 0986401006335/2	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00



6.27	Canara Bank, Saraidhela A/c no. 0986401006335/1	27-01-20	27-01-2021	10,000,000.00	6.30%	Maturity	10,645,041.00	112500.00
6.28	SBI, ISM CAMPUS A/c no. -39134937566	11-02-20	10-08-2020	5,000,000.00	5.50%	Maturity	5,138,264.00	38194.44
6.12				267,244,641.00				53,342,563.44

7.00	Investments maturing during the F. Y. 2021-22:-							
7.01	HDFC BANK, SARAIHELIA, 50300400958896	27-01-20	29-01-22	17,000,000.00	6.40%		2,308,838.00	193,224.00
7.02	HDFC BANK, SARAIHELIA, 50300400215526	27-01-20	28-01-22	19,000,000.00	6.40%		2,576,685.00	215,956.00
7.03	HDFC BANK, SARAIHELIA, 50300401464821	27-01-20	30-01-22	14,000,000.00	6.40%		1,904,185.00	159,126.00
Total				50,000,000.00				568,306.00

8.00	Investments maturing during the F. Y. 2023-24:-							
8.01	SBI, Main Branch, Bank More, Dhanbad TBSB1106400501	13-05-17	6 yrs 13.05.2023	125,000,000.00	8%		75,125,000.00	32,591,221.81
Total				125,000,000.00				32,591,221.81
Grand Total		41 Nos.		561,894,304.00				
		Total of FDR Face Value as on 31.03.2020		561,894,304.00	Accrued Interest as on 31.03.2020		92,798,445.21	



INDIAN INSTITUTE OF TECHNOLOGY (INDIAN SCHOOL OF MINES), DHANBAD

IIT (ISM) DHANBAD ANNUAL ACCOUNTS F.Y. 2019-20

Statement of Project Investments- 31.03.2020

x	Name of Bank/Branch Account No.	FDR/TDR No. & Effect. Dt.	Date of Investment	Closing Date	Maturity Date	Period of Deposit	Principal (Rs.)	Intt. Rate %	Interest (Rs.)	Maturity Value (Rs.)	Accrued Interest	
1.00	Investments maturing during the F. Y. 2017-18 :-											
1.01	Canara Bank SDL Br. Dhanbad	0986401002923/1	25-03-13	31-03-19	25.03.2018 (05 yrs)		10,411,681.00	9%	Maturity - Pledged	16,327,160.00	7,445,600.55	
		Sub-total			48 Nos		10,411,681.00				7,445,600.55	
2.00	Investments maturing during the F. Y. 2019-20 :-											
2.01	Canara Bank SDL Branch Dhanbad	0986307000076/6	26-02-17	31-03-19	181 DAYS 25.8.17		8,277,699.00	6.50%	184,263.85	8,461,962.85	1,753,595.01	
2.02	Canara Bank SDL Branch Dhanbad	0986307000076/7	26-02-17	31-03-19	181 DAYS 25.8.17		8,277,699.00	6.50%	184,263.85	8,461,962.85	1,753,595.01	
2.03	Canara Bank SDL Branch Dhanbad	09864130000203/6 dated	19-04-17	31-03-19	555 days		8,441,181.00	6.35%	848,732.00	9,289,913.00	1,442,149.62	
2.04	Canara Bank SDL Branch Dhanbad	09864130000203/5 dated	19-04-17	31-03-19	555 days		8,441,181.00	6.35%	848,732.00	9,289,913.00	1,442,149.62	
2.05	Canara Bank SDL Branch Dhanbad	09864130000203/4 dated	19-04-17	31-03-19	555 days		8,441,181.00	6.35%	848,732.00	9,289,913.00	1,442,149.62	
2.06	Canara Bank SDL Branch Dhanbad	0986401005909/01 (pledged)	26-04-18	31-03-20	27-04-19	12 months	1,300,000.00	6.50%			167,147.56	
2.07	Canara Bank SDL Branch Dhanbad	0986401005622/2	07-04-18	31-03-19	07-04-19	12 months	5,393,040.00	6.50%	359,185.00	5,752,225.00	749,939.72	
2.08	PLEGDED - SEE ABOVE											
2.09	Canara Bank SDL Branch Dhanbad	0986401006127/1	07-06-19		07-03-20	9 months	9,088,115.00	6.20%	429,181.00	9,517,296.00	465,633.97	
2.10	Canara Bank SDL Branch Dhanbad	0986401006128/1	07-06-19		07-03-20	9 months	9,088,115.00	6.20%	429,181.00	9,517,296.00	465,633.97	
2.11	Canara Bank SDL Branch Dhanbad	0986401006129/1	07-06-19		07-03-20	9 months	9,090,039.00	6.20%	429,181.00	9,519,220.00	465,762.69	
		Sub-total			67 Nos		75,839,250.00				10,147,756.79	
3.00	Investments maturing during the FY 2020 - 21:											
3.01	Canara Bank SDL Branch Dhanbad	0986413000170/17	24-11-18	31-03-19	01-06-20	555 days	9,953,724.00	7.10%	1,124,396.00	11,078,120.00	995,111.52	
3.02	Canara Bank SDL Branch Dhanbad	0986413000170/21	24-11-18	31-03-19	01-06-20	555 days	9,953,724.00	7.10%	1,124,396.00	11,078,120.00	995,111.52	
3.03	Canara Bank SDL Branch Dhanbad	0986413000170/24	24-11-18	31-03-19	01-06-20	555 days	4,495,854.00	7.10%	507,862.00	5,003,716.00	113,018.10	
3.04	Canara Bank SDL Branch Dhanbad	0986413000170/18	24-11-18	31-03-19	01-06-20	555 days	9,953,724.00	7.10%	1,124,393.00	11,078,120.00	995,111.52	
3.05	Canara Bank SDL Branch Dhanbad	0986413000170/19	24-11-18	31-03-19	01-06-20	555 days	9,953,724.00	7.10%	1,124,393.00	11,078,120.00	995,111.52	
3.06	Canara Bank SDL Branch Dhanbad	0986413000170/20	24-11-18	31-03-19	01-06-20	555 days	9,953,724.00	7.10%	1,124,393.00	11,078,120.00	995,111.52	
3.07	Canara Bank SDL Branch Dhanbad	0986413000064/21	31-12-18	31-03-19	08-07-20	555 days	7,674,013.00	7.10%	866,874.00	8,540,887.00	706,908.94	
3.08	Canara Bank SDL Branch Dhanbad	0986413000064/23	31-12-18	31-03-19	08-07-20	555 days	7,674,013.00	7.10%	866,874.00	8,540,887.00	706,908.94	
3.09	Canara Bank SDL Branch Dhanbad	0986413000419/1	31-12-18	31-03-19	08-07-20	555 days	965,943.00	7.10%	1,075,058.00	2,041,001.00	87,144.81	

3.10	Canara Bank SDL Branch Dhanbad	0986413000064/22 31/12/2018	31-12-18	31-03-19	08-07-20	555 days	9,999,999.00	7.10%	1,129,623.00	11,129,622.00	921,171.98
3.11	Punjab National Bank, Katras Road Branch	151500JU000000026	29-04-19		29-04-20	1 YEAR	142,255,716.00	7.46%	10,912,863.00	153,168,579.00	10,068,560.00
3.12	Punjab National Bank, Katras Road Branch	151500JU000000017	29-04-19		29-04-20	1 YEAR	150,000,000.00	7.46%	11,506,951.00	161,506,951.00	10,616,684.00
3.14	Canara Bank SDL Branch Dhanbad	0986401005933/11	30-05-19		30-05-20	1 YEAR	8,528,041.00	6.75%	590,378.00	9,118,419.00	491,197.68
3.15	Canara Bank SDL Branch Dhanbad	0986401005933/12	30-05-19		30-05-20	1 YEAR	8,528,041.00	6.75%	590,378.00	9,118,419.00	491,197.68
3.16	Canara Bank SDL Branch Dhanbad	0986401005933/13	30-05-19		30-05-20	1 YEAR	8,528,041.00	6.75%	590,378.00	9,118,419.00	491,197.68
3.17	Canara Bank SDL Branch Dhanbad	0986401005933/14	30-05-19		30-05-20	1 YEAR	8,528,041.00	6.75%	590,378.00	9,118,419.00	491,197.68
3.18	Canara Bank SDL Branch Dhanbad	0986401005933/15	30-05-19		30-05-20	1 YEAR	8,528,041.00	6.75%	590,378.00	9,118,419.00	491,197.68
3.19	Canara Bank SDL Branch Dhanbad	0986413000453/1	05-07-19		02-06-20	333 days	8,000,000.00	6.70%	500,213.00	8,500,213.00	404,594.44
3.20	Canara Bank SDL Branch Dhanbad	0986413000452/1	05-07-19		02-06-20	333 days	8,000,000.00	6.70%	500,213.00	8,500,213.00	404,594.44
3.21	Canara Bank SDL Branch Dhanbad	0986413000451/1	05-07-19		02-06-20	333 days	8,000,000.00	6.70%	500,213.00	8,500,213.00	404,594.44
3.22	Canara Bank SDL Branch Dhanbad	0986413000455/1	18-07-19		15-06-20	333 days	8,000,000.00	6.70%	500,213.00	8,500,213.00	384,853.80
3.23	Canara Bank SDL Branch Dhanbad	0986413000456/1	18-07-19		15-06-20	333 days	8,000,000.00	6.70%	500,213.00	8,500,213.00	384,853.80
3.24	Canara Bank SDL Branch Dhanbad	0986413000457/1	18-07-19		15-06-20	333 days	9,095,105.00	6.70%	568,686.00	9,663,791.00	437,535.89
3.25	Canara Bank SDL Branch Dhanbad	0986413000458/1	18-07-19		15-06-20	333 days	9,095,105.00	6.70%	568,686.00	9,663,791.00	437,535.89
3.26	Canara Bank SDL Branch Dhanbad	0986413000459/1	18-07-19		15-06-20	333 days	9,095,105.00	6.70%	568,686.00	9,663,791.00	437,535.89
3.27	Canara Bank SDL Branch Dhanbad	0986401005966/2	29-06-19		30-06-20	12 months 1 day	9,289,459.00	6.70%	640,029.00	9,929,488.00	478,292.42
3.28	Canara Bank SDL Branch Dhanbad	0986413000469/1	06-08-19		04-07-20	333 days	5,000,000.00	6.70%	312,638.00	5,312,638.00	222,500.80
3.29	Canara Bank SDL Branch Dhanbad	0986413000470/1	06-08-19		04-07-20	333 days	5,000,000.00	6.70%	312,638.00	5,312,638.00	222,500.80
3.30	Canara Bank SDL Branch Dhanbad	0986413000471/1	06-08-19		04-07-20	333 days	5,000,000.00	6.70%	312,638.00	5,312,638.00	222,500.80
3.31	Canara Bank SDL Branch Dhanbad	0986413000472/1	06-08-19		04-07-20	333 days	5,000,000.00	6.70%	312,638.00	5,312,638.00	222,500.80
3.32	Canara Bank SDL Branch Dhanbad	0986401006199/1	06-09-19		06-09-20	12 months	8,543,153.00	6.50%	568,988.00	9,112,141.00	319,734.32
3.33	Canara Bank SDL Branch Dhanbad	0986401006200/1	06-09-19		06-09-20	12 months	8,543,153.00	6.50%	568,988.00	9,112,141.00	319,734.32
3.34	Canara Bank SDL Branch Dhanbad	0986401006201/1	06-09-19		06-09-20	12 months	8,543,153.00	6.50%	568,988.00	9,112,141.00	319,734.32
3.35	Canara Bank SDL Branch Dhanbad	0986401006202/1	06-09-19		06-09-20	12 months	8,543,153.00	6.50%	568,988.00	9,112,141.00	319,734.32
3.36	Canara Bank SDL Branch Dhanbad	0986401006203/1	06-09-19		06-09-20	12 months	8,543,153.00	6.50%	568,988.00	9,112,141.00	319,734.32
3.37	Canara Bank SDL Branch Dhanbad	0986401006204/1	06-09-19		06-09-20	12 months	8,543,153.00	6.50%	568,988.00	9,112,141.00	319,734.32
3.38	Canara Bank SDL Branch Dhanbad	0986401006205/1	06-09-19		06-09-20	12 months	8,543,153.00	6.50%	568,988.00	9,112,141.00	319,734.32



3.39	Canara Bank SDL Branch Dhanbad	0986401006206/1	06-09-19	06-09-20	12 months	8,543,153.00	6.50%	568,988.00	9,112,141.00	319,734.32
3.40	Canara Bank SDL Branch Dhanbad	0986401006230/7	01-10-19	01-10-20	12 months	9,000,000.00	6.50%	599,415.00	9,599,415.00	294,877.00
3.41	PNB Housing Finance Limited, Kolkata	1153000110312870	25-10-19	25-10-20	12 months	5,498,335.00	8.15%	458,365.00	5,956,700.00	195,206.00
3.42	PNB Housing Finance Limited, Kolkata	1153000110312850	25-10-19	25-10-20	12 months	20,000,000.00	8.15%	1,667,285.00	21,667,285.00	710,055.00
3.43	PNB Housing Finance Limited, Kolkata	1153000110312857	25-10-19	25-10-20	12 months	20,000,000.00	8.15%	1,667,285.00	21,667,285.00	710,055.00
3.44	PNB Housing Finance Limited, Kolkata	1153000110312856	25-10-19	25-10-20	12 months	20,000,000.00	8.15%	1,667,285.00	21,667,285.00	710,055.00
3.45	PNB Housing Finance Limited, Kolkata	1153000110312849	28-10-19	28-10-20	12 months	20,000,000.00	8.15%	1,667,285.00	21,667,285.00	696,658.00
3.46	PNB Housing Finance Limited, Kolkata	1153000110312850	28-10-19	28-10-20	12 months	20,000,000.00	8.15%	1,667,285.00	21,667,285.00	696,658.00
3.47	PNB Housing Finance Limited, Kolkata	1153000110312851	28-10-19	28-10-20	12 months	20,000,000.00	8.15%	1,667,285.00	21,667,285.00	696,658.00
3.48	PNB Housing Finance Limited, Kolkata	1153000110312852	28-10-19	28-10-20	12 months	20,000,000.00	8.15%	1,667,285.00	21,667,285.00	696,658.00
3.49	PNB Housing Finance Limited, Kolkata	1153000110312853	28-10-19	28-10-20	12 months	20,000,000.00	8.15%	1,667,285.00	21,667,285.00	696,658.00
3.50	PNB Housing Finance Limited, Kolkata	1153000110312854	28-10-19	28-10-20	12 months	7,021,742.00	8.15%	585,308.00	7,607,050.00	244,587.00
3.51	Can Bank SDL Br	0986401006258/1	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.52	Can Bank SDL Br	0986401006258/2	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.53	Can Bank SDL Br	0986401006258/3	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.54	Can Bank SDL Br	0986401006258/4	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.55	Can Bank SDL Br	0986401006258/5	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.56	Can Bank SDL Br	0986401006258/6	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.57	Can Bank SDL Br	0986401006258/7	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.58	Can Bank SDL Br	0986401006258/8	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.59	Can Bank SDL Br	0986401006258/9	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.60	Can Bank SDL Br	0986401006258/10	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.61	Can Bank SDL Br	0986401006258/11	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.62	Can Bank SDL Br	0986401006258/12	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.63	Can Bank SDL Br	0986401006258/13	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.64	Can Bank SDL Br	0986401006258/14	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.65	Can Bank SDL Br	0986401006258/15	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.66	Can Bank SDL Br	0986401006258/16	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.67	Can Bank SDL Br	0986401006258/17	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.68	Can Bank SDL Br	0986401006258/18	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.69	Can Bank SDL Br	0986401006258/19	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.70	Can Bank SDL Br	0986401006258/20	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.71	Can Bank SDL Br	0986401006258/21	07-11-19	07-11-20	12 months	15,000,000.00	6.50%	999,024.00	15,999,024.00	392,376.56
3.72	Can Bank SDL Br	0986401006258/23	07-11-19	07-11-20	12 months	903,121.00	6.50%	999,024.00	1,902,145.00	23,624.52
3.73	Can Bank SDL Br	0986401006013/2	14-11-19	14-11-20	12 months	8,552,556.00	6.50%	569,614.00	9,122,170.00	212,736.33
3.74	Can Bank SDL Br	0986401006336/8	27-01-20	27-01-21	12 months	9,000,000.00	6.30%	580,537.00	9,580,537.00	100,800.00

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3.75	Can Bank SDL Br	0986401006336/7	27-01-20	27-01-21	12 months	10,000,000.00	6.30%	645,041.00	10,645,041.00	112,000.00
3.76	Can Bank SDL Br	0986401006336/6	27-01-20	27-01-21	12 months	10,000,000.00	6.30%	645,041.00	10,645,041.00	112,000.00
3.77	Can Bank SDL Br	0986401006336/5	27-01-20	27-01-21	12 months	10,000,000.00	6.30%	645,041.00	10,645,041.00	112,000.00
3.78	Can Bank SDL Br	0986401006336/4	27-01-20	27-01-21	12 months	10,000,000.00	6.30%	645,041.00	10,645,041.00	112,000.00
3.79	Can Bank SDL Br	0986401006336/3	27-01-20	27-01-21	12 months	10,000,000.00	6.30%	645,041.00	10,645,041.00	112,000.00
3.80	Can Bank SDL Br	0986401006336/2	27-01-20	27-01-21	12 months	10,000,000.00	6.30%	645,041.00	10,645,041.00	112,000.00
3.81	Can Bank SDL Br	0986401006336/1	27-01-20	27-01-21	12 months	10,000,000.00	6.30%	645,041.00	10,645,041.00	112,000.00
3.82	Can Bank SDL Br	0986301000169/1	31-03-20	16-05-20	46 Days	5,000,000.00	5.00%	31,506.84	5,031,506.84	616.93
3.83	Can Bank SDL Br	0986301000169/2	31-03-20	16-05-20	46 Days	5,000,000.00	5.00%	31,506.84	5,031,506.84	616.93
3.84	Can Bank SDL Br	0986301000169/3	31-03-20	16-05-20	46 Days	5,000,000.00	5.00%	31,506.84	5,031,506.84	616.93
3.85	Can Bank SDL Br	0986301000169/4	31-03-20	16-05-20	46 Days	5,000,000.00	5.00%	31,506.84	5,031,506.84	616.93
3.86	Can Bank SDL Br	0986301000169/5	31-03-20	16-05-20	46 Days	5,000,000.00	5.00%	31,506.84	5,031,506.84	616.93
3.87	Can Bank SDL Br	0986301000169/6	31-03-20	16-05-20	46 Days	5,000,000.00	5.00%	31,506.84	5,031,506.84	616.93
3.88	Can Bank SDL Br	0986301000169/7	31-03-20	16-05-20	46 Days	5,000,000.00	5.00%	31,506.84	5,031,506.84	616.93
3.89	Can Bank SDL Br	0986301000169/8	31-03-20	16-05-20	46 Days	5,000,000.00	5.00%	31,506.84	5,031,506.84	616.93
3.90	Can Bank SDL Br	0986301000169/9	31-03-20	16-05-20	46 Days	5,000,000.00	5.00%	31,506.84	5,031,506.84	616.93
3.91	Can Bank SDL Br	0986301000169/10	31-03-20	16-05-20	46 Days	5,000,000.00	5.00%	31,506.84	5,031,506.84	616.93
3.92	Can Bank SDL Br	0986301000169/11	31-03-20	16-05-20	46 Days	5,000,000.00	5.00%	31,506.84	5,031,506.84	616.93
4.00	Investments maturing during the F. Y. 2021-22 :-									
4.01	SBI ISM Br. Dhanbad	32088884875 dtd 16.12.2011	16-12-11	31-03-20	16.12.2021	8,005,000.00	9.25%	maturity	1,99,76,031.00	9,269,553.17
4.02	SBI ISM Br. Dhanbad	32088884343 dtd 16.12.2011	16-12-11	31-03-20	16.12.2021	8,000,000.00	9.25%	maturity	1,99,63,554.00	9,263,763.32
4.03	SBI ISM Br. Dhanbad	32088885325 dtd 16.12.2011	16-12-11	31-03-20	16.12.2021	8,010,000.00	9.25%	maturity	19,988,508.00	9,275,343.03
		Sub-total			5 Nos.	24,015,000.00				27,808,659.52
						1,220,370,115.00				
TOTAL INVESTMENTS UNDER PROJECTS AS ON 31.03.2020						1,330,635,046.00	Accrued Interest as on 31.03.2020		98,992,208.24	



INDIAN INSTITUTE OF TECHNOLOGY (INDIAN SCHOOL OF MINES) DHANBAD
INVESTMENTS UNDER CHAIR FUNDS (PROJECTS) AS ON 31.03.2020

MOLE CHAIR										
Sl No	Name of Bank	Account No	Date of Investment	Date of Investment	Date of Maturity	Face Value	Rate of Interest	Interest (Rs)	Maturity (Rs)	Accrued Interest (Rs)
Mole - 6	CanBank SDL Br. Dhanbad MOLE	0986303000168/1	08-02-20	07.11.2019 01 years	07-11-20	500,000.00	6.50%	Q. intt. Rs. 8,125.00	500,000.00	4,875.00
Mole - 7	CanBank SDL Br. Dhanbad MOLE	0986303000169/1	08-02-20	07.11.2019 01 years	07-11-20	1,000,000.00	6.50%	Q. intt. Rs. 16,250.00	1,000,000.00	9,750.00
Mole - 8	CanBank SDL Br. Dhanbad MOLE	0986303000170/1	08-02-20	07.11.2019 01 years	07-11-20	1,000,000.00	6.50%	Q. intt. Rs. 16,250.00	1,000,000.00	9,750.00
Mole - 9	CanBank SDL Br. Dhanbad MOLE	0986303000171/1	08-02-20	07.11.2019 01 years	07-11-20	2,500,000.00	6.50%	Q. intt. Rs. 40,625.00	2,500,000.00	24,375.00
Mole - 10	CanBank SDL Br. Dhanbad MOLE	0986303000172/1	08-02-20	07.11.2019 01 years	07-11-20	5,000,000.00	6.50%	Q. intt. Rs. 81,250.00	5,000,000.00	48,750.00
						10,000,000.00				97,500.00



SAIL NMDC CHAIR

SJ NO	Name of Bank	Account No	Date of Investment	Date of Maturity	Period of Investment	Face Value	Rate of Interest	Interest (Rs)	Maturity (Rs)
SAIL-1	Canara Bank SDL Branch Dhanbad	SAIL NMDC 986303000140/2 dt.06.05.2019	07-02-19	06.05.2019		56,490.00	6.60%	7,456.00	63,946.00
SAIL-2	Canara Bank SDL Branch Dhanbad SAIL NMDC CHAIR	0986307000053/11 12/10/2019	15-10-18	10-04-20	181 days	1,652,347.00	6.00%	49,163.00	1,652,347.00
SAIL-3	Canara Bank SDL Branch Dhanbad SAIL NMDC CHAIR	098635900002/7 06/12/2018	07-09-20	13-06-20	555 days	8,685,867.00	7.10%	Quarterly Interest	8,685,867.00
SAIL-4	Canara Bank SDL Branch Dhanbad SAIL NMDC CHAIR	098635900002/8 06/12/2018	06-12-18	13-06-20	555 days	1,378,713.00	7.10%	on Maturity	1,378,713.00
SAIL-5	Canara Bank SDL Branch Dhanbad SAIL NMDC CHAIR	0986359000016/3 12/01/2019	12-01-19	20-07-20	555 days	6,059,765.00	7.10%	Quarterly Interest	6,059,765.00
SAIL-6	Canara Bank SDL Branch Dhanbad	SAIL 09863030000158/1	28-01-19	29-04-19	29-04-20	2,288,811.00	6.75%	Quarterly Interest	2,288,811.00
SAIL-7	Canara Bank SDL Branch Dhanbad	SAIL 09863030000159/1	28-01-19	29-04-19	29-04-20	2,288,811.00	6.75%	Quarterly Interest	2,288,811.00
SAIL-8	Canara Bank SDL Branch Dhanbad	SAIL 09863030000160/1	28-01-19	29-04-19	29-04-20	2,288,811.00	6.75%	Quarterly Interest	2,288,811.00
SAIL-9	Canara Bank SDL Branch Dhanbad	SAIL 09863030000161/1	28-01-19	29-04-19	29-04-20	2,288,811.00	6.75%	Quarterly Interest	2,288,811.00
SAIL-10	Canara Bank SDL Branch Dhanbad	SAIL 09863030000162/1	28-01-19	29-04-19	29-04-20	2,288,811.00	6.75%	Quarterly Interest	2,288,811.00
						29,277,237.00			445,407.12



ONGC AMN GHOSH CHAIR

Sl No	Name of Bank	Account No	Date of Investment	Date of Maturity	Period of Investment	Face Value	Rate of Interest	Interest (Rs)	Maturity (Rs)	
ONGC-1	Canara Bank SDL Branch Dhanbad ONGC AMN GHOSH CHAIR	0986303000127/4 24/10/2018	24-01-20	23-10-20	23 months 29 days	1,200,000.00	7.00%	Quarterly Interest	1,200,000.00	15,633.33
ONGC-2	Canara Bank SDL Branch Dhanbad ONGC Chair	0986359000015/3 11/01/2019	11-01-20	19-07-20	555 days	5,161,513.00	7.10%	Quarterly Interest	5,161,513.00	81,325.65
ONGC-3	Canara Bank SDL Branch Dhanbad	AMN GHOSH CHAIR 986303000149/1 dt.29.04.2019	29-01-20	29-04-20	1 YEAR	4,507,397.00	6.90%	Quarterly Interest	4,507,397.00	52,398.49
						10,868,910.00				149,357.47

CIL CHAIR

Sl No	Name of Bank	Account No	Date of Investment	Date of Maturity	Period of Investment	Face Value	Rate of Interest	Interest (Rs)	Maturity (Rs)	
CIL-4	Bank of India, ISM Branch CIL Chair	587243710000076 26-10-2019	28-03-19	26-10-20	12 MONTHS	6,000,000.00	6.40%	Quarterly Interest Rs 96,000/-	6,000,000.00	3,175.51
CIL-5	Canara Bank SDL Branch Dhanbad CIL Chair	0986359000007/8 06/12/2018	06-03-19	13-06-20	555 days	5,636,346.00	7.10%	Quarterly Interest	5,636,346.00	28,506.01
CIL-6	Canara Bank SDL Branch Dhanbad CIL Chair	0986359000001/7 06/12/2018	06-03-19	13-06-20	555 days	5,672,433.00	7.10%	Quarterly Interest	5,672,433.00	28,688.52
CIL-7	Canara Bank SDL Branch Dhanbad CIL Chair	0986303000166/1		25-10-19	25-10-20	7,100,000.00	6.50%	Quarterly Interest of Rs 1,15,375/- each	7,100,000.00	84,608.33
CIL-8	Canara Bank SDL Branch Dhanbad CIL Chair	0986307000148/1		07-02-20	06-08-20	5,000,000.00	5.90%		5,146,288.00	43,643.84
						29,408,779.00				188,622.21



RAJEEV GANDHI CHAIR

Sl No	Name of Bank	Account No	Date of Investment	Date of Maturity	Period of Investment	Face Value	Rate of Interest	Interest (Rs)	Maturity (Rs)
RG-2	Canara Bank SDL Branch Dhanbad Rajiv Gandhi Chair	0986303000148/1 28/01/2019	28-01-19	28-01-20	1 yr	5,000,000.00	7%	Quarterly Interest	5,000,000.00
RG-3	Canara Bank SDL Branch Dhanbad Rajiv Gandhi Chair	0986303000147/1 28/01/2019	28-01-19	28-01-20	1 yr	5,500,000.00	7%	Quarterly Interest	5,500,000.00
RG-4	Canara Bank SDL Branch Dhanbad Rajiv Gandhi Chair	0986359000012/6 10/12/2018	10-03-19	17-06-20	555 days	8,021,699.00	7.10%	Quarterly Interest	8,021,699.00
RG-5	Canara Bank SDL Branch Dhanbad Rajiv Gandhi Chair	0986359000012/5 10/12/2018	10-03-19	17-06-20	555 days	4,040,034.00	7.10%	Quarterly Interest	4,040,034.00
RG-6	Canara Bank SDL Branch Dhanbad Rajiv Gandhi Chair	0986303000167/1		25-10-19	25-10-20	1,000,000.00	6.50%	Quarterly Interest of Rs 16,250/- each	1,000,000.00
						23,561,733.00			179,296.78



NMDC CHAIR

Sl No	Name of Bank	Account No	Date of Investment	Date of Maturity	Period of Investment	Face Value	Rate of Interest	Interest (Rs)	Maturity (Rs)	
NMDC-3	Central Bank of India, Bartand, Dhanbad. NMDC Chair Fund	TDR No: 286861 A/c No: 3662809030 Dtd: 09.02.2018	09-08-18	09.01.2020 1 Year & 11 months		5,000,000.00	6.60%	Quarterly Int of Rs 82,500/- payable at Project 22872 Bank A/c	5,000,000.00	78,073.00
NMDC-4	Central Bank of India, Bartand, Dhanbad. NMDC Chair Fund	TDR No: 286862 A/c No: 3662809187 Dtd: 09.02.2018	09-08-18	09.01.2020 1 Year & 11 months		5,000,000.00	6.60%	Quarterly Int of Rs 82,500/- payable at Project 22872 Bank A/c	5,000,000.00	78,073.00
NMDC-5	Central Bank of India, Bartand, Dhanbad. NMDC Chair Fund	TDR No: 286863 A/c No: 3662809631 Dtd: 09.02.2018	09-08-18	09.01.2020 1 Year & 11 months		5,000,000.00	6.60%	Quarterly Int of Rs 82,500/- payable at Project 22872 Bank A/c	5,000,000.00	78,073.00
NMDC-6	Canara Bank SDL Branch Dhanbad NMDC CHAIR FUND INVESTMENT	0986303000164/1 dated 09.10.2019	07-01-19	09.10.2020 12 months	12 MONTHS	5,000,000.00	6.50%	Quarterly Int of Rs 81,250/- payable at Project 22872 Bank A/c	5,000,000.00	74,027.78
NMDC-7	Canara Bank SDL Branch Dhanbad NMDC CHAIR FUND INVESTMENT	0986303000165/1 dated 09.10.2019	07-01-19	09.10.2020 12 months	12 MONTHS	5,000,000.00	6.50%	Quarterly Int of Rs 81,250/- payable at Project 22872 Bank A/c	5,000,000.00	74,027.78
						25,000,000.00				382,274.56



RUNGTA CHAIR

Sl.No	Name of Bank	Account No	Date of Investment	Date of Maturity	Period of Investment	Face Value	Rate of Interest	Interest (Rs)	Maturity (Rs)	
RUNGTA 1	Central Bank of India, Bartand, Dhanbad. Rungta Chair Fund	TDR No: 286866 A/c No: 3662810262 Dtd: 09.02.2018	09-02-18	09.01.2020 1 Year & 11 months		5,000,000.00	6.60%	Quarterly Int of Rs 82,500/- payable at Project 9746 Bank A/c	5,000,000.00	78,073.00
RUNGTA 2	Central Bank of India, Bartand, Dhanbad. Rungta Chair Fund	TDR No: 286867 A/c No: 3662810397 Dtd: 09.02.2018	09-02-18	09.01.2020 1 Year & 11 months		5,000,000.00	6.60%	Quarterly Int of Rs 82,500/- payable at Project 9746 Bank A/c	5,000,000.00	78,073.00
RUNGTA 3	Central Bank of India, Bartand, Dhanbad. Rungta Chair Fund	TDR No: 286868 A/c No: 3662810909 Dtd: 09.02.2018	09-02-18	09.01.2020 1 Year & 11 months		5,000,000.00	6.60%	Quarterly Int of Rs 82,500/- payable at Project 9746 Bank A/c	5,000,000.00	78,073.00
RUNGTA 4	Central Bank of India, Bartand, Dhanbad. Rungta Chair Fund	TDR No: 286869 A/c No: 3662811119 Dtd: 09.02.2018	09-02-18	09.01.2020 1 Year & 11 months		5,000,000.00	6.60%	Quarterly Int of Rs 82,500/- payable at Project 9746 Bank A/c	5,000,000.00	78,073.00
						20,000,000.00				312,292.00



TATA STEEL CHAIR

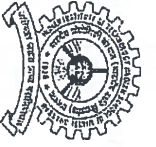
Sl No	Name of Bank	Account No	Date of Investment	Date of Maturity	Period of Investment	Face Value	Rate of Interest	Interest (Rs)	Maturity (Rs)
TS-1	Central Bank of India, Barand, Dhanbad. TATA Steel Chair Fund	TDR No: 286864 A/c No: 3662801767 Dtd: 09.02.2018	09-01-20	09.01.2020 1 Year & 11 months		6,400,000.00	6.30%	Quarterly Int of Rs 1,05,600/- payable at Project 22874 Bank A/c	6,400,000.00
TS-2	Central Bank of India, Barand, Dhanbad. TATA Steel Chair Fund	TDR No: 286869 A/c No: 3662801949 Dtd: 09.02.2018	09-01-20	09.01.2020 1 Year & 11 months		6,400,000.00	6.30%	Quarterly Int of Rs 1,05,600/- payable at Project 22874 Bank A/c	6,400,000.00
TS-3	Canara Bank SDL Branch Dhanbad TATA STEEL CHAIR	0986303000127/3 24/10/2018	24-01-20	29-10-20	23 months 29 days	3,000,000.00	7%	Quarterly Interest	3,000,000.00
TS-4	Canara Bank SDL Branch Dhanbad TATA STEEL CHAIR	0986303000129/3 28/11/2018	28-02-20	28-11-20	24 months	5,000,000.00	6.70%	Quarterly Interest	5,000,000.00
TS-5	Canara Bank SDL Branch Dhanbad TATA STEEL CHAIR	0986303000129/4 28/11/2018	28-02-20	28-11-20	24 months	5,000,000.00	6.70%	Quarterly Interest	5,000,000.00
URANIUM CHAIR									
						25,800,000.00			300,365.99

Sl No	Name of Bank	Account No	Date of Investment	Date of Maturity	Period of Investment	Face Value	Rate of Interest	Interest (Rs)	Maturity (Rs)
U-1	Union Bank of India, Bank more	TDR no.0003493 303/225642 24.10.2013	24-10-13	24.05.2021		5,000,000.00	9.25%	mat - Uranium Chair Inv.	10,002,769.00
U-2	Union Bank of India, Bank more PLEDGED with BG for consortium	TDR no.0003494 303/225642 24.10.2013	24-10-13	24.05.2021		5,000,000.00	9.25%	mat - Uranium Chair Inv.	10,002,769.00
						10,000,000.00			8,165,581.48



SANDVIK CHAIR

Sl.No	Name of Bank	Account No	Date of Investment	Date of Maturity	Period of Investment	Face Value	Rate of Interest	Interest (Rs)	Maturity (Rs)
SANDVIK 1	Canara Bank SDL Branch Dhanbad SANDVIK CHAIR	0986359000021/1 11/02/2019	11-02-20	19-08-20	555 days	4,584,641.00	7.10%	Quarterly Interest	4,584,641.00
						4,584,641.00			44,590.34
Total Investments in Chair Funds as on 31.03.2020						188,501,300.00	TOTAL ACCRUED INTEREST AS ON 31.03.2020		10,265,287.95



IIT (ISM) DHANBAD
INVESTMENTS IN SCHOLARSHIP (PROJECTS) AS ON 31.03.2020

Sl No	Name of Bank/Branch Account No.	FDR/TDR No. & Effect. Dt.	Date of Investment	Date of Investment	Maturity Date	Period of Deposit	Principal (Rs.)	Intt. Rate %	Interest (Rs.)	Maturity Value (Rs.)	Accrued Interest
SCH-1	Bank of India, ISM Branch Dhanbad	06.10.2019 no. 587243710000057	06-12-19	31-03-20	06.10.2024 5 years		1,500,000.00	6.25%	23438 Qty POONAM (KHANNA) SINGH END. FUND	1500000.00	2327.43
SCH-2	Bank of India, ISM Campus Branch	587243710000023	14-04-19	14-04-18	14-04-20	12 months	500,000.00	6.70%	8375 Quarterly Interest Late Bhaskar Bhattacharya Memorial Fund	500,000.00	831.25
SCH-3	Canara Bank SDL Branch Dhanbad	0986306000001/2 DT 14.2.17	14-12-17		14.02.2027 120 MONTHS		200,000.00	6.90%	Yearly Compound Interest Late Bhaskar Bhattacharya Memorial Fund	200,000.00	15583.67
SCH-4	Bank of India, ISM Campus Branch	587243710000025	14-04-19	14-04-18	14-04-20	12 months	300,000.00	6.70%	5025 Quarterly Interest Smt Renuka Rajhans Memorial Fund	300,000.00	498.75



Sl No	Name of Bank/Branch Account No.	FDR/TDR No. & Effect. Dt.	Date of Investment	Date of Investment	Maturity Date	Period of Deposit	Principal (Rs.)	Int. Rate %	Interest (Rs.)	Maturity Value (Rs.)	Accrued Interest
SCH-5	Canara Bank SDL Branch Dhanbad NAAM SCHOLARSHIP FUND INVESTMENT	0986401005977/1	16-07-18	16-07-18	17-07-19	12 months 1 day	500,000.00	7%	36,032.00	536,032.00	57913.36
SCH-6	Canara Bank SDL Branch Dhanbad Inderjeet & Satiyawati Scholarship Fund Investment	0986401004762/5	13-06-18	13-06-18	13-06-19	12 months	326,630.00	6.50%	21,755.00	348,385.00	39081.12
SCH-7	Canara Bank SDL Branch Dhanbad Sneha Lata Srivastava Memorial Fund	0986303000145/2 08/12/2018	08-03-19	08-03-19	08-12-19	1 yr	318,232.00	7%	Quarterly Interest	318,232.00	24779.97
SCH-8	Canara Bank SDL Branch Dhanbad Nirja Sahay Memorial Fund	0986304000019/2 dt 30.3.16	30-03-19	30-03-19	30.03.2021 60 Months		130,000.00	7.50%	Half Yearly Interest Nirja Sahay Memorial Fund	130,000.00	27.08
SCH-9	Canara Bank SDL Branch Dhanbad Chitra Bhattacharya Memorial Fund	0986413000449/1	30-03-19	30-03-19	05-10-20	555 days	366,284.00	7.10%	41,372.00	407,656.00	26920.91
SCH - 10	Canara Bank SDL Branch Dhanbad	L J JOHNSON 0986303000150/1 dt.29.04.2019	29-04-19	29-04-19	29-04-20		258,416.00	6.75%	Quarterly Interest	258,416.00	3004.09
SCH - 11	Canara Bank SDL Branch Dhanbad	ATLAS CAPCO 0986303000151/1 dt.29.04.2019	29-04-19	29-04-19	29-04-20		646,035.00	6.75%	Quarterly Interest	646,035.00	7510.16
Total Investments in Award Funds as on 31-03-2020							5,045,597.00		Accrued Interest as on 31.03.2020		178,477.80



Investment under General Maintenance as on 31.03.2020

S. No.	Name of Bank/Branch Account No.	FDR/TDR No.	Date of Investment	Maturity Date	Period of Deposit	Principal (Rs.)	Intt. Rate %	Interest (Rs.)	Maturity Value (Rs.)	Accrued Interest
1.01	Canara Bank SDL Branch Dhanbad	0986401006221/1	18-09-19	18-09-20	12 MONTHS	5,000,000.00	6.50%	333,008.00	5,333,008.00	175,940.63
1.02	Canara Bank SDL Branch Dhanbad	0986401006221/2	18-09-19	18-09-20	12 MONTHS	5,000,000.00	6.50%	333,008.00	5,333,008.00	175,940.63
1.03	Canara Bank SDL Branch Dhanbad	0986401006221/3	18-09-19	18-09-20	12 MONTHS	5,000,000.00	6.50%	333,008.00	5,333,008.00	175,940.63
1.04	Canara Bank SDL Branch Dhanbad	0986401006221/4	18-09-19	18-09-20	12 MONTHS	5,000,000.00	6.50%	333,008.00	5,333,008.00	175,940.63
1.05	Canara Bank SDL Branch Dhanbad	0986401006221/5	18-09-19	18-09-20	12 MONTHS	5,000,000.00	6.50%	333,008.00	5,333,008.00	175,940.63
1.06	Canara Bank SDL Branch Dhanbad	0986401006221/6	18-09-19	18-09-20	12 MONTHS	5,000,000.00	6.50%	333,008.00	5,333,008.00	175,940.63
Investment in General Maintenance Fund as on 31.03.2020						30,000,000.00		Accrued Interest as on 31.03.2020		1,055,643.78



भारतीय प्रौद्योगिकी संस्थान (भारतीय खनि विद्यापीठ)
 धनबाद - 826004, झारखण्ड, भारत
Indian Institute of Technology (Indian School of Mines)
Dhanbad - 826004, Jharkhand, INDIA

No. IIT(ISM)/F&A/Non Plan/UC:2019-20

GFR 12 – A

[(See Rule 238 (1)]

FORM OF UTILIZATION CERTIFICATE

UNAUDITED UTILIZATION CERTIFICATE FOR THE YEAR 2019-20

In respect of Grants-in-Aid/Salaries under Non-Plan (Recurring)

1. Name of the Scheme : Indian Institute of Technology (Indian School of Mines), Dhanbad
2. Whether recurring or non-recurring grants : Recurring (Revenue)
3. Grants position at the beginning of the Financial year
 - (i) Cash in Hand/Bank : Nil
 - (ii) Unadjusted advances : -306.32 lakhs
 - (iii) Total : -306.32 lakhs (this includes excess establishment expense of ₹ 301.68 lakhs to be received from MHRD)
4. Details of grants received, expenditure incurred and closing balances: (Actuals)

(₹ in Lakhs)

Unspent Balances of Grants of Previous year [figure as at Sl. No. 3 (iii)]	Interest Earned thereon	Interest deposited back to the Government /Internal Income	Grant received during the year			Total Available funds (1+2-3+4)	Expenditure incurred	Closing Balances (5-6)	
			Sanction No.(i)	Date (ii)	Head (Numerical Code)				Amount (iii)
1	2	3	4			5	6	7	
Deficit of ₹ 306.32 lakhs	Nil	6330.75	F. No. 23-1/2019 – TS I	06.05.19	31	965.44	27023.75	27027.63	-3.88
				06.05.19	36	2273.00			
				06.05.19	31	65.75			
				06.05.19	36	153.00			
				06.05.19	31	30.99			
				06.05.19	36	74.00			
				23.05.19	31	79.89			
				23.05.19	31	5.33			
				23.05.19	31	2.59			
				06.06.19	31	455.00			
				06.06.19	36	1000.00			
				06.06.19	31	30.00			
				06.06.19	36	68.00			
				06.06.19	31	15.00			
				06.06.19	36	32.00			
				31.07.19	31	580.00			
				31.07.19	36	1000.00			
				31.07.19	36	68.00			
31.07.19	36	32.00							
31.07.19	31	19.00							
31.07.19	31	39.00							
01.08.19	31	98.00							

In service of the Nation since 1926

Phone: 0326-2296605; Fax: 0326 2296605; Email: registrar@iitism.ac.in; Website: www.iitism.ac.in



भारतीय प्रौद्योगिकी संस्थान(भारतीय खनि विद्यापीठ)
धनबाद - 826004, झारखण्ड, भारत
Indian Institute of Technology (Indian School of Mines)
Dhanbad - 826004, Jharkhand, INDIA

				01.08.19	31	6.31		
				01.08.19	31	3.00		
				08.08.19	31	34.00		
				08.08.19	31	16.00		
				08.08.19	31	500.00		
				08.08.19	36	1000.00		
				08.08.19	36	68.00		
				08.08.19	36	32.00		
				11.09.19	31	500.00		
				11.09.19	31	34.00		
				11.09.19	31	16.00		
				11.09.19	36	1000.00		
				11.09.19	36	68.00		
				11.09.19	36	32.00		
				28.10.19	31	117.00		
				28.10.19	31	8.00		
				28.10.19	31	4.00		
				28.10.19	31	546.00		
				28.10.19	31	36.00		
				28.10.19	31	18.00		
				28.10.19	36	1000.00		
				28.10.19	36	68.00		
				28.10.19	36	32.00		
				06.11.19	31	546.00		
				06.11.19	31	36.00		
				06.11.19	31	18.00		
				06.11.19	36	1000.00		
				06.11.19	36	68.00		
				06.11.19	36	32.00		
				05.12.19	31	546.00		
				05.12.19	31	36.00		
				05.12.19	31	18.00		
				05.12.19	36	1000.00		
				05.12.19	36	68.00		
				05.12.19	36	32.00		
				31.12.19	36	400.00		
				31.12.19	31	233.00		
				24.01.20	31	177.00		
				24.01.20	31	12.00		
				24.01.20	31	6.00		
				24.01.20	31	546.00		
				24.01.20	31	36.00		
				24.01.20	36	1000.00		
				24.01.20	31	18.00		
				24.01.20	36	68.00		
				24.01.20	36	32.00		
				07.02.20	31	546.00		
				07.02.20	31	36.00		
				07.02.20	31	18.00		
				07.02.20	36	1000.00		
				07.02.20	36	68.00		

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भारतीय प्रौद्योगिकी संस्थान(भारतीय खनि विद्यापीठ)
धनबाद - 826004, झारखण्ड, भारत
Indian Institute of Technology (Indian School of Mines)
Dhanbad - 826004, Jharkhand, INDIA

				07.02.20	36	32.00		
				28.02.20	31	695.00		
				12.03.20	31	119.01		
				12.03.20	36	212.00		
				12.03.20	36	91.00		
				26.03.20	36	30.00		
				Total		20999.32		

Component wise utilization of grants:

(Rs. in Lakhs)

Grant-in-aid- General	HEFA Repayment(Principal) & IRG Reserve	Grant-in-aid- Salary (Establishment Expense)	Total
10103.00	4090.87	12833.76	27027.63

Details of grants position as on 31.03.20

- (i) Cash in Hand/Bank : -3.88
(ii) Unadjusted Advances : -
(iii) Total : -3.88

Certified that I have satisfied myself that the conditions on which the grants were sanctioned have been duly fulfilled/are being fulfilled and that I have exercised the following checks to see that the money has been actually utilized for the purpose for which it was sanctioned:

- (i) The main accounts and other subsidiary accounts and registers (including assets registers) are maintained as prescribed by MHRD for CEIs and have been duly audited by Indian Audit & Accounts Department, Lucknow. The figures depicted above tally with the audited figures mentioned in financial statements/accounts.
- (ii) There exist internal controls for safeguarding public funds/assets, watching outcomes and achievements of physical targets against the financial inputs, ensuring quality in asset creation etc. & the periodic evaluation of internal controls is exercised to ensure their effectiveness.
- (iii) To the best of our knowledge and belief, no transactions have been entered that are in violation of relevant Act/Rules/standing instructions and scheme guidelines.
- (iv) The responsibilities among the key functionaries for execution of the scheme have been assigned in clear terms and are not general in nature.
- (v) The benefits were extended to the intended beneficiaries and only such areas/districts were covered where the scheme was intended to operate.
- (vi) The expenditure on various components of the scheme was in the proportions authorized as per the scheme guidelines and terms and conditions of the grants-in-aid.

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भारतीय प्रौद्योगिकी संस्थान(भारतीय खनि विद्यापीठ)
धनबाद - 826004, झारखण्ड, भारत
Indian Institute of Technology (Indian School of Mines)
Dhanbad - 826004, Jharkhand, INDIA

- (vii) It has been ensured that the physical and financial performance under IIT (ISM) Dhanbad scheme has been according to the requirements, as prescribed in the guidelines issued by Govt. of India and the performance/targets achieved statement for the year to which the utilization of the fund resulted in outcomes given at Annexure - I duly enclosed.
- (viii) ~~The utilization of the fund resulted in outcomes given at Annexure - II duly enclosed (to be formulated by the Ministry/Department concerned as per their requirements/specifications).~~
- (ix) ~~Details of various schemes executed by the agency through grants in aid received from the same Ministry or from other Ministries is enclosed at Annexure - II (to be formulated by the Ministry/Department concerned as per their requirements/specifications).~~

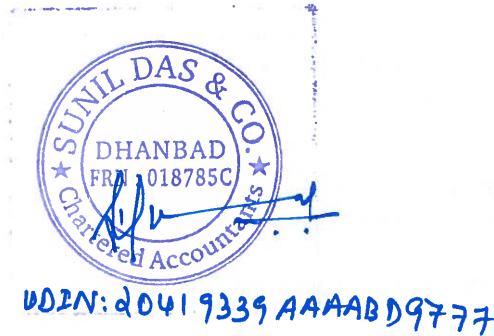
Date: 14.5.2020

Place: Dhanbad


(PRABODH PANDEY)
DY REG (F&A)/ REGISTRAR (ACTG.)


(PROF. K. PATTANAYAK)
DY. DIRECTOR


(PROF. RAJIV SHEKHAR)
DIRECTOR



In service of the Nation since 1926

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भारतीय प्रौद्योगिकी संस्थान(भारतीय खनि विद्यापीठ)
धनबाद - 826004, झारखण्ड, भारत
Indian Institute of Technology (Indian School of Mines)
Dhanbad - 826004, Jharkhand, INDIA

No. IIT(ISM)/F&A/Plan/UC:2019-20

GFR 12 – A

[(See Rule 238 (1)]

FORM OF UTILIZATION CERTIFICATE

UNAUDITED UTILIZATION CERTIFICATE FOR THE YEAR 2019-20
In respect of Grants-in-Aid/Creation of Capital Assets under Plan

1. Name of the Scheme : IIT (ISM), Dhanbad
2. Whether recurring or non-recurring grants : Non-Recurring
3. Grants position at the beginning of the Financial year
 - (i) Cash in Hand/Bank : Nil (figure indicating against GIA and Institute income)
 - (ii) Unadjusted advances : -1.14 lakhs
 - (iii) Total : -1.14 lakhs
4. Details of grants received, expenditure incurred and closing balances: (Actuals)

(₹ in Lakhs)

Unspent Balances of Grants of Previous years [figure as at Sl. No. 3 (iii)]	Interest Earned thereon	Interest deposited back to the Government /Internal Income	Grant received during the year			Total Available funds (1+2+3+4)	Expenditure incurred	Closing Balances (5-6)
			Sanction No.(i)	Date (ii)	Amount (iii)			
1	2	3	4			5	6	7
Deficit of ₹ 1.14 lakhs	Nil	3.88	F. No. 23-1/2019 – TS - I	19.06.19	1637.00	9902.74	9357.48	545.26
				19.06.19	110.00			
				19.06.19	53.00			
				08.08.19	364.00			
				08.08.19	24.00			
				08.08.19	12.00			
				11.09.19	364.00			
				11.09.19	24.00			
				11.09.19	12.00			
				28.10.19	1318.00			
				28.10.19	89.00			
				28.10.19	43.00			
				06.11.19	523.00			
				06.11.19	35.00			
				06.11.19	17.00			
05.12.19	523.00							

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भारतीय प्रौद्योगिकी संस्थान(भारतीय खनि विद्यापीठ)
धनबाद - 826004, झारखण्ड, भारत
Indian Institute of Technology (Indian School of Mines)
Dhanbad - 826004, Jharkhand, INDIA

			05.12.19	35.00			
			05.12.19	17.00			
			31.12.19	50.00			
			31.12.19	1546.00			
			31.12.19	104.00			
			28.02.20	3000.00			
			Total	9900.00			

Component wise utilization of grants:

Grant-in-aid- Creation of Capital Assets	Total (₹ in Lakhs)
9357.48	9357.48

Details of grants position at the end of the year

- (i) Cash in Hand/Bank : 545.26 lakhs
(ii) Unadjusted Advances : 0
(iii) Total : 545.26 lakhs

Certified that I have satisfied myself that the conditions on which the grants were sanctioned have been duly fulfilled/are being fulfilled and that I have exercised the following checks to see that the money has been actually utilized for the purpose for which it was sanctioned:

- (i) The main accounts and other subsidiary accounts and registers (including assets registers) are maintained as prescribed by MHRD for CEIs and have been duly audited by Indian Audit & Accounts Department, Lucknow. The figures depicted above tally with the audited figures mentioned in financial statements/accounts.
- (ii) There exist internal controls for safeguarding public funds/assets, watching outcomes and achievements of physical targets against the financial inputs, ensuring quality in asset creation etc. & the periodic evaluation of internal controls is exercised to ensure their effectiveness.
- (iii) To the best of our knowledge and belief, no transactions have been entered that are in violation of relevant Act/Rules/standing instructions and scheme guidelines.
- (iv) The responsibilities among the key functionaries for execution of the scheme have been assigned in clear terms and are not general in nature.
- (v) The benefits were extended to the intended beneficiaries and only such areas/districts were covered where the scheme was intended to operate.
- (vi) The expenditure on various components of the scheme was in the proportions authorized as per the scheme guidelines and terms and conditions of the grants-in-aid.

In service of the Nation since 1926

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भारतीय प्रौद्योगिकी संस्थान(भारतीय खनि विद्यापीठ)
धनबाद - 826004, झारखण्ड. भारत
Indian Institute of Technology (Indian School of Mines)
Dhanbad - 826004, Jharkhand, INDIA

- (vii) It has been ensured that the physical and financial performance under IIT (ISM) Dhanbad scheme has been according to the requirements, as prescribed in the guidelines issued by Govt. of India ~~and the performance/targets achieved statement for the year to which the utilization of the fund resulted in outcomes given at Annexure-I duly enclosed.~~
- (viii) ~~The utilization of the fund resulted in outcomes given at Annexure-II duly enclosed (to be formulated by the Ministry/Department concerned as per their requirements/specifications).~~
- (ix) ~~Details of various schemes executed by the agency through grants in aid received from the same Ministry or from other Ministries is enclosed at Annexure-II (to be formulated by the Ministry/Department concerned as per their requirements/specifications).~~

Date: 14.5.2020

Place: Dhanbad


(PRABODH PANDEY)
DY REG (F&A)/ REGISTRAR (ACTG.)


(PROF. J. K. PATTANAYAK)
DY. DIRECTOR


(PROF. RAJIV SHEKHAR)
DIRECTOR



UDIN: 20419339 AAAABD 9777

In service of the Nation since 1926

Phone: 0326-2296605; Fax: 0326 2296605; Email: registrar@iitism.ac.in; Website: www.iitism.ac.in

F.No.23-1/2018-TS-I
Government of India
Ministry of Human Resource Development
Department of Higher Education
Technical Section - I

Shastri Bhavan, New Delhi
Dated 31.12.2019

To,
The Accounts Officer,
Pay & Accounts Office,
Department of Higher Education,
Ministry of Human Resource Development,
New Delhi -110001.

Subject: Grants-in-Aid(GIA) released to Indian Institute of Technology(IIT), ISM, Dhabad during the financial year 2018-19 under the scheme "Support to IITs"- issue of Final Utilization Certificate .

Sir,

I am directed to forward herewith Final Utilization Certificate in respect of Indian Institute of Technology (IIT), ISM, Dhanbad towards grants-in-aid released under the scheme "Support to Indian Institute of Technology (IITs)" during the financial year 2018-19 for information and record.

Yours faithfully,

Encl.: As above.


(P.J. Soundararajan)

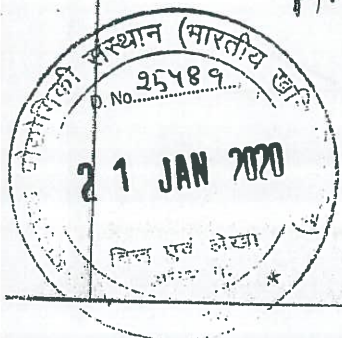
Under Secretary to the Government of India
Tel: -23381698

Copy to:-

1. The Director General of Audit (Central Revenues), DGACR (Special Cell), I.P. Estate, ITO, New Delhi -110002.
1. The Registrar, Indian Institute of Technology (ISM) Dhanabad. Jharkhand.
2. Integrated Finance Division (IFD), MHRD.
3. Utilization Certificate(UC) Cell, MHRD.
4. Guard file(2 Copies), MHRD.

DB (IFD)
AH (IAS)

Final
18/1/2020





भारतीय प्रौद्योगिकी संस्थान(भारतीय खनि विद्यापीठ)

धनबाद - 826004, झारखण्ड, भारत

Indian Institute of Technology (Indian School of Mines)

Dhanbad - 826004, Jharkhand, INDIA

No. IIT(ISM)/F&A/Plan/UC: 2018-19

GFR 12 - A

[(See Rule 238 (1))]

FORM OF UTILIZATION CERTIFICATE

AUDITED UTILIZATION CERTIFICATE FOR THE YEAR 2018-19
In respect of Grants-in-Aid/Creation of Capital Assets under Plan

- Name of the Scheme : IIT (ISM), Dhanbad
- Whether recurring or non-recurring grants : Non-Recurring
- Grants position at the beginning of the Financial year
 - Cash in Hand/Bank : Nil
 - Unadjusted advances : -1.72 lakhs
 - Total : -1.72 lakhs
- Details of grants received, expenditure incurred and closing balances: (Actuals)

(₹ in Lakhs)

Unspent Balances of Grants of Previous years [figure as at Sl. No. 3 (iii)]	Interest Earned thereon	Interest deposited back to the Government /Internal Income	Grant received during the year			Total Available funds (1+2-3+4)	Expenditure incurred	Closing Balances (5-6)
			Sanction No.(i)	Date (ii)	Amount (iii)			
1	2	3	4			5	6	7
Deficit of ₹ 1.72.lakhs	Nil	4.99	F. No. 23-1/2018-TS - I	27.4.18	1800.00	7003.27	7004.41	-1.14
				27.4.18	125.00			
				27.4.18	75.00			
				27.8.18	1800.00			
				27.8.18	125.00			
				27.8.18	75.00			
				23.10.18	1760.00			
				23.10.18	160.00			
				23.10.18	80.00			
				21.01.19	932.00			
				21.01.19	27.00			
				21.01.19	41.00			
			Total		7000.00			

[Signature]

[Signature]
27/11/19

In service of the Nation since 1926

Phone: 0326-2296605; Fax: 0326 2296605; Email: registrar@iitism.ac.in; Website: www.iitism.ac.in



भारतीय प्रौद्योगिकी संस्थान(भारतीय खनि विद्यापीठ)
धनबाद - 826004, झारखण्ड, भारत
Indian Institute of Technology (Indian School of Mines)
Dhanbad - 826004, Jharkhand, INDIA

Component wise utilization of grants:

Grant-in-aid- Creation of Capital Assets	Total (₹ in Lakhs)
7004.16	7004.41

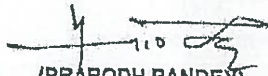
Details of grants position at the end of the year

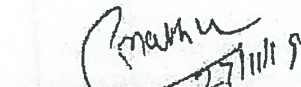
- (i) Cash in Hand/Bank : Nil (figure indicating against GIA and Institute income)
(ii) Unadjusted Advances : -1.14 lakhs
(iii) Total : -1.14 lakhs

Certified that I have satisfied myself that the conditions on which the grants were sanctioned have been duly fulfilled/are being fulfilled and that I have exercised the following checks to see that the money has been actually utilized for the purpose for which it was sanctioned:

- (i) The main accounts and other subsidiary accounts and registers (including assets registers) are maintained as prescribed by MHRD for CEIs and have been duly audited by Indian Audit & Accounts Department, Lucknow. The figures depicted above tally with the audited figures mentioned in financial statements/accounts.
- (ii) There exist internal controls for safeguarding public funds/assets, watching outcomes and achievements of physical targets against the financial inputs, ensuring quality in asset creation etc. & the periodic evaluation of internal controls is exercised to ensure their effectiveness.
- (iii) To the best of our knowledge and belief, no transactions have been entered that are in violation of relevant Act/Rules/standing instructions and scheme guidelines.
- (iv) The responsibilities among the key functionaries for execution of the scheme have been assigned in clear terms and are not general in nature.
- (v) The benefits were extended to the intended beneficiaries and only such areas/districts were covered where the scheme was intended to operate.
- (vi) The expenditure on various components of the scheme was in the proportions authorized as per the scheme guidelines and terms and conditions of the grants-in-aid.
- (vii) It has been ensured that the physical and financial performance under ISM Dhanbad scheme has been according to the requirements, as prescribed in the guidelines issued by Govt. of India and the performance/targets achieved statement for the year to which the utilization of the fund resulted in outcomes given at Annexure-I duly enclosed.
- (viii) The utilization of the fund resulted in outcomes given at Annexure-II duly enclosed (to be formulated by the Ministry/Department concerned as per their requirements/specifications).
- (ix) Details of various schemes executed by the agency through grants-in-aid received from the same Ministry or from other Ministries is enclosed at Annexure-II (to be formulated by the Ministry/Department concerned as per their requirements/specifications).

Date: 27.11.19
Place: Dhanbad


(PRABODH PANDEY)
DY REGISTRAR (F&A)


(DR PRAMOD MATHUR)
REGISTRAR (Addl Charge)

In service of the Nation since 1926

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भारतीय प्रौद्योगिकी संस्थान(भारतीय खनि विद्यापीठ)
 धनबाद - 826004, झारखण्ड, भारत
 Indian Institute of Technology (Indian School of Mines)
 Dhanbad - 826004, Jharkhand, INDIA

No. IIT(ISM)/F&A/Non Plan/UC:2018-19

GFR 12 - A

[(See Rule 238 (1))]

FORM OF UTILIZATION CERTIFICATE
 AUDITED UTILIZATION CERTIFICATE FOR THE YEAR 2018-19

In respect of Grants-in-Aid/Salaries under Non-Plan (Recurring)

- Name of the Scheme : Indian Institute of Technology (Indian School of Mines), Dhanbad
- Whether recurring or non-recurring grants : Recurring (Revenue)
- Grants position at the beginning of the Financial year
 - Cash in Hand/Bank : Nil
 - Unadjusted advances : -3.16 lakhs
 - Total : -3.16 lakhs
- Details of grants received, expenditure incurred and closing balances: (Actuals)

Unspent Balances of Grants of Previous year [figure as at Sl. No. 3 (iii)]	Interest Earned thereon	Interest deposited back to the Government /Internal Income	Grant received during the year			Total Available funds (1+2-3+4)	Expenditure incurred	Closing Balances (5-6)	
			Sanction No.(i)	Date (ii)	Head (Numerical Code) (iii)				Amount (iv)
Deficit of ₹ 3.16 lakhs	Nil	6017.93	F. No. 23-1/2018 - TS I	27.04.18	31	276.00	22814.77	23121.09	-306.32
				27.04.18	36	864.00			
				27.04.18	31	18.00			
				27.04.18	36	60.00			
				27.04.18	31	6.00			
				27.04.18	36	26.00			
				18.06.18	31	529.00			
				18.06.18	36	1636.00			
				18.06.18	31	34.50			
				18.06.18	36	115.00			
				18.06.18	31	11.50			
				18.06.18	36	49.00			
				27.08.18	31	552.00			
				27.08.18	31	36.00			
				27.08.18	31	12.00			
				27.08.18	36	1682.00			
				27.08.18	36	118.00			
				27.08.18	36	50.00			
				07.09.18	36	818.00			
				07.09.18	36	57.00			
07.09.18	36	25.00							
07.09.18	31	253.00							

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(Signature)
 27/09/18



भारतीय प्रौद्योगिकी संस्थान(भारतीय खनि विद्यापीठ)
धनबाद - 826004, झारखण्ड, भारत
Indian Institute of Technology (Indian School of Mines)
Dhanbad - 826004, Jharkhand, INDIA

			07.09.18	31	16.50		
			07.09.18	31	5.50		
			23.10.18	31	506.00		
			23.10.18	31	46.00		
			23.10.18	31	23.00		
			23.10.18	36	836.00		
			23.10.18	36	76.00		
			23.10.18	36	38.00		
			05.11.18	31	460.00		
			05.11.18	31	30.00		
			05.11.18	31	10.00		
			05.11.18	36	818.00		
			05.11.18	36	57.00		
			05.11.18	36	25.00		
			05.12.18	31	460.00		
			05.12.18	36	818.00		
			05.12.18	31	30.00		
			05.12.18	36	57.00		
			05.12.18	31	10.00		
			05.12.18	36	25.00		
			21.01.19	31	500.00		
			21.01.19	36	1409.00		
			21.01.19	36	99.00		
			21.01.19	36	42.00		
			06.02.19	31	500.00		
			06.02.19	36	1019.00		
			06.02.19	36	61.00		
			06.02.19	36	20.00		
			07.03.19	31	475.00		
			07.03.19	36	1008.00		
			07.03.19	36	63.00		
			07.03.19	36	29.00		
			Total		16800.00		

Component wise utilization of grants:

(Rs. in Lakhs)		
Grant-in-aid- General	Grant-in-aid- Salary (Establishment Expense)	Total
10819.41	12301.68	23121.09

Details of grants position as on 31.03.19

- (i) Cash in Hand/Bank : Nil (figure indicating against GIA and Institute income)
(ii) Unadjusted Advances : -306.32 Lakhs
(iii) Total : -306.32 Lakhs (this includes excess establishment expense of ₹ 301.68 lakhs to be received from MHRD)

Certified that I have satisfied myself that the conditions on which the grants were sanctioned have been duly fulfilled/are being fulfilled and that I have exercised the following checks to see that the money has been actually utilized for the purpose for which it was sanctioned:

[Signature]

[Signature]
27/11/19

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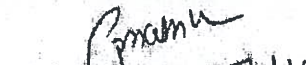


भारतीय प्रौद्योगिकी संस्थान (भारतीय खनि विद्यापीठ)
धनबाद - 826004, झारखण्ड, भारत
Indian Institute of Technology (Indian School of Mines)
Dhanbad - 826004, Jharkhand, INDIA

- (i) The main accounts and other subsidiary accounts and registers (including assets registers) are maintained as prescribed by MHRD for CEIs and have been duly audited by Indian Audit & Accounts Department, Lucknow. The figures depicted above tally with the audited figures mentioned in financial statements/accounts.
- (ii) There exist internal controls for safeguarding public funds/assets, watching outcomes and achievements of physical targets against the financial inputs, ensuring quality in asset creation etc. & the periodic evaluation of internal controls is exercised to ensure their effectiveness.
- (iii) To the best of our knowledge and belief, no transactions have been entered that are in violation of relevant Act/Rules/standing instructions and scheme guidelines.
- (iv) The responsibilities among the key functionaries for execution of the scheme have been assigned in clear terms and are not general in nature.
- (v) The benefits were extended to the intended beneficiaries and only such areas/districts were covered where the scheme was intended to operate.
- (vi) The expenditure on various components of the scheme was in the proportions authorized as per the scheme guidelines and terms and conditions of the grants-in-aid.
- (vii) It has been ensured that the physical and financial performance under ISM Dhanbad scheme has been according to the requirements, as prescribed in the guidelines issued by Govt. of India and the performance/targets achieved statement for the year to which the utilization of the fund resulted in outcomes given at Annexure-I duly enclosed.
- (viii) The utilization of the fund resulted in outcomes given at Annexure-II duly enclosed (to be formulated by the Ministry/Department concerned as per their requirements/specifications).
- (ix) Details of various schemes executed by the agency through grants-in-aid received from the same Ministry or from other Ministries is enclosed at Annexure-III (to be formulated by the Ministry/Department concerned as per their requirements/specifications).

Date: 27.11.19
Place: Dhanbad


(PRABODH PANDEY)
DY REGISTRAR (F&A)


(DR. PRAMOD MATHUR) (I) (I) (I)
REGISTRAR (Addl Charge)



11. Separate Audit Report (SAR)

Separate Audit Report is not included in this Annual Report of IIT(ISM), Dhanbad for the year 2019-20 as it has not been received from Indian Audit and Accounts Department till date.