



राष्ट्रीय प्रौद्योगिकी संस्थान राउरकेला

NATIONAL INSTITUTE OF TECHNOLOGY ROURKELA

EXM/001

END SEMESTER EXAMINATION PROGRAMME (2022-23 / AUTUMN)

09 NOV 2022 16:36

Day 1 : Date / Day of Examination : 23-Nov-2022 ( Wednesday )

FIRST SESSION ( 08.30 am to 11.30 am )		
Sl.No	Subject	Subject Name
1	BM3101	Genetic Engineering
2	BM3601	Biomedical Instrumentation I
3	BM6031	Anatomy and Physiology
4	BM6631	Industrial Biotechnology
5	CE3001	Estimation and Construction Management
6	CE6101	Advanced Soil Mechanics
7	CE6203	Analysis and Design of Plates and Shells
8	CE6301	Transportation Systems Planning
9	CE6401	Hydrologic Elements and Analysis
10	CH3111	Process Equipment Design
11	CH6233	Principles of Analytical and Characterization Instruments
12	CR3103	Application of Phase Diagram
13	CS3001	Data Communication
14	CY3201	Chemistry of Elements
15	CY5101	Methods in Organic Synthesis
16	CY7107	Special Topics in Organic Synthesis
17	EC3001	Semiconductor Devices
18	EE3103	Power Generation, Transmission and Distribution
19	EE4101	Power System Protection
20	EE6131	Digital Image Processing
21	EE6201	Power System Analysis and Control
22	EE6301	Linear System Theory
23	EE6443	Switched Mode Power Conversion
24	ER5003	Hydrogeology
25	ER5401	Physics of Atmosphere
26	ER5603	Parameterization of Physical Process
27	ER6023	Introduction to Earth Science
28	FP3105	Food Analysis and Quality Control
29	FP6101	Advanced Food Analysis and Quality Control
30	HS5001	Research Methodology in Social Sciences
31	HS5323	Rural Development
32	HS7401	Introduction to Economic Growth And Development
33	ID3201	Creative Engineering Design
34	LS3302	Bioinstrumentation
35	LS5502	Immunotechniques
36	LS6003	Advanced Microbiology
37	MA5118	Lie Algebra

SECOND SESSION ( 01.30 pm to 04.30 pm )		
Sl.No	Subject	Subject Name
1	BM2001	Medical Science I
2	BM2007	Biochemistry
3	BM4401	Plant Biotechnology
4	CE2001	Civil Engineering Materials and Construction
5	CE4503	Environmental Impact Assessment
6	CH2111	Fluid Dynamics
7	CH4311	Process Modeling and Simulation
8	CH6331	Process Plant Simulation
9	CR2101	Materials Thermodynamics
10	CR4101	Structural Ceramics
11	CR6101	Sintering and Microstructure
12	CS2001	Digital System Design
13	CS6101	Computer Architecture
14	CS6301	Foundations of Computer Security
15	CY2301	Physical Chemistry: Equilibrium and Changes
16	CY4101	Stereochemistry and Reaction Mechanism
17	EC2001	Analog Electronics
18	EC4201	VLSI Design Techniques
19	EC6201	Digital VLSI Design
20	EC6405	Advanced Electromagnetic Theory
21	EC6503	Statistical Signal Theory
22	EE2001	Electrical Machines - I
23	ER2251	Mining Geology
24	FP2101	Food Chemistry
25	FP4109	Food Ingredients and Additives
26	ID2101	Elements and Principles of Design
27	ID4301	Computer Aided Manufacturing
28	LS2101	Basic Biochemistry
29	LS4301	Bioanalytical Techniques
30	MA4101	Real Analysis: Series of Functions and Calculus of Several Variables
31	MM2107	Basic Physical Metallurgy
32	MM2301	Metallurgical Thermodynamics and Kinetics
33	MM4108	Stainless steel Technologies
34	MN6035	Mine Systems Engineering
35	PA2303	Building Construction - II
36	PA4301	Advanced Building Materials
37	PH4002	Electrodynamics
38	SM6131	Commercial Banking

38	MA6103	Advanced Complex Analysis
39	ME3101	Design of Machine Elements
40	ME4237	Decision Modeling
41	ME6103	Analysis and Synthesis of Mechanisms
42	ME6203	Production Technology
43	ME6305	Advanced Thermodynamics
44	MM3505	Advances in Materials
45	MM6211	Mechanical Behaviour of Materials
46	MN3001	Mining Machinery
47	PA3001	Architectural Heritage Conservation
48	PA3003	Universal Design
49	PA5401	Advanced Structural Systems
50	PH3001	Thermal and Statistical Physics
51	PH6233	Advanced X-rays Structure Analysis
52	PH6343	Mesoscopic Physics
53	PH6466	Low Temperature Properties of Matter
54	SM6101	Financial and Cost Accounting

39	SM6231	Retail Management
40	SM6311	Employee Relations and Labour Legislations

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FIRST SESSION ( 08.30 am to 11.30 am )		
Sl.No	Subject	Subject Name
1	BM3001	Analytical Instrumentation and Techniques
2	BM3301	Bioprocess Instrumentation and Control
3	BM6303	Biomedical Instrumentation
4	BM6501	Bioprocess Engineering
5	CE3107	Foundation Engineering
6	CE6103	Soil-Structure Interaction
7	CE6201	Matrix Method of Structural Analysis
8	CE6305	Traffic Engineering
9	CE6403	Computational Fluid Dynamics
10	CH3113	Mass Transfer Operations– II
11	CR3101	Physical Ceramics: Properties
12	CS3003	Object-Oriented System Design
13	CY3301	Physical Chemistry: Matters and Surface
14	CY5103	Heterocycles and Natural Products
15	CY7302	Chemistry of Nanomaterials
16	EC3301	Control System Engineering
17	EE4103	High Voltage Engineering and HVDC Transmission
18	EE6103	Advanced Signal Processing
19	EE6205	Extra High Voltage Transmission
20	EE6245	Silicon Solar Cell Technology
21	EE6403	Power Electronic Converters and Machine Drives
22	ER5101	Mineral Sciences
23	ER5103	Sedimentary Petrology
24	ER5403	Dynamics of Atmosphere
25	ER6015	Physical and dynamical Oceanography
26	FP3301	Processing of Spices, Condiments and Plantation crops
27	FP6205	Advanced Food Plant and Equipment Design
28	HS5201	Psychological Perspective On Development
29	HS5313	Gender and Development
30	HS7303	Social Change
31	ID3203	Introduction to Ergonomics
32	LS5604	Ecology and Environmental Sciences
33	LS6007	Food Microbiology
34	MA3103	Introduction to Real Analysis and Metric Spaces
35	MA5101	Functional Analysis
36	MA6107	Advanced Linear Algebra
37	MA6621	Probability and Statistics
38	ME3103	System Dynamics and Control
39	ME4333	Refrigeration and Air-Conditioning
40	ME6135	Applied Finite Element Analysis

SECOND SESSION ( 01.30 pm to 04.30 pm )		
Sl.No	Subject	Subject Name
1	BM2005	Biostatistics
2	BM4001	Statistics for Bioengineers
3	CE2003	Mechanics of Solids
4	CH2211	Chemical Process Calculations
5	CH6101	Advanced Fluid Dynamics
6	CH6301	Modeling and Analysis of Energy Systems
7	CR2401	Unit Operations in Ceramic Processing
8	CR4107	Mechanical Behaviour of Ceramics
9	CS2003	Discrete Structures
10	CS6103	Data Structure and Algorithm Design
11	CY2201	Principles of Inorganic Chemistry
12	CY4201	Main Group and Organometallic Chemistry
13	EC2005	Network Analysis and Synthesis
14	EC6303	Advanced Instrumentation and Signal Conditioning
15	EC6505	Advanced Digital Communication
16	EC6607	Transform Domain Signal Processing and Applications
17	EE2003	Electrical Measurement and Instrumentation
18	FP2103	Principles of Food Technology
19	FP4207	Food Industry By-Product and Waste Management
20	ID6101	Design Introduction
21	LS4103	Biochemistry
22	MA4103	Complex Analysis - II
23	ME2103	Kinematics of Machines
24	MM2302	Transport Phenomena
25	MM4509	Nanostructured Materials
26	MN3025	Blasting Technology
27	MN6261	Safety Risk Assessment and Management
28	PA4303	Advanced Building Construction
29	PH2001	Waves and Oscillations
30	PH4001	Mathematical Methods in Physics
31	SM6151	Security Analysis and Portfolio Management
32	SM6431	Services Operations Management

41	ME6335	Thermodynamics of Cryogenic System
42	ME6538	Advanced IC Engine Technology
43	MM3201	Deformation Behavior of Materials
44	MM6311	Metallurgical Thermodynamics and Kinetics
45	MN3005	Mine Economics
46	PA3801	Landscape Design
47	PA5501	Professional Practice
48	PA6101	Planning Theory and Process
49	PH6005	Experimental Techniques in Physics
50	SM6201	Marketing Management
51	SM6331	Training and Development



Day 3 : Date / Day of Examination : 25-Nov-2022 ( Friday )

FIRST SESSION ( 08.30 am to 11.30 am )		
Sl.No	Subject	Subject Name
1	BM3201	Biomaterials
2	BM3303	Biochemical Engineering
3	BM6301	Biomedical Signal Processing
4	BM6633	Advanced Environmental Biotechnology
5	CE3203	Reinforced Concrete Design
6	CE6105	Soil Exploration and Analysis of Foundations
7	CE6231	Structural Dynamics
8	CE6405	Water Resources Management
9	CH3215	Processing and Handling of Materials
10	CR3201	Instrumental Characterization
11	CS3005	Microprocessors and Microcontrollers
12	CY3302	Chemical Kinetics and Photochemistry
13	CY5201	Bioinorganic Chemistry
14	CY7303	Computational Methods in Chemistry
15	EC3501	Principles of Communication Systems
16	EE3301	Principles of Control Systems Engineering
17	EE6105	Microwave and Antenna Systems
18	EE6305	Digital Control
19	EE6441	Wind and Solar Energy Systems
20	ER5301	Structural Geology
21	ER5405	Physics of Ocean
22	ER6021	Introduction to Climate Science
23	FP3501	Dairy Process Engineering
24	FP6235	Advanced Thermal Operation in Food Processing
25	HS5401	Economics for Development Studies
26	HS5423	Contemporary Policy Issues in Development
27	HS7404	International Economics
28	ID3205	Interaction Design
29	LS3405	Genetics
30	LS6006	Developmental Genetics
31	MA5251	Discrete Mathematics
32	MA6305	Advanced Numerical Analysis
33	ME3201	Metal Machining and Automation
34	ME4131	Mechanical Vibration
35	ME6105	Control System Engineering
36	ME6205	Metal Cutting and Tool Design
37	ME6303	Advanced Fluid Mechanics
38	MM3304	Steel Making
39	MM6521	Powder Technology
40	MN3101	Underground Metal Mining
41	PA6403	Housing and Community Planning
42	PH3062	Vacuum Science and Applications

SECOND SESSION ( 01.30 pm to 04.30 pm )		
Sl.No	Subject	Subject Name
1	BM2009	Microbiology
2	BM2601	Analog and Digital Electronics for Bioengineers
3	BM4201	Nanobiotechnology
4	CE2005	Surveying
5	CE4103	Advanced Foundation Engineering
6	CH2411	Chemical Engineering Thermodynamics
7	CH6105	Advanced Heat Transfer
8	CR6333	Ceramics in Energy Sectors
9	CS6316	Internet of Things
10	CS6403	Software Architecture
11	CS6412	Artificial Intelligence
12	CY2101	Hydrocarbons and Their Functional Groups
13	CY4301	Quantum Chemistry
14	EC6205	Integrated Circuit for Digital Signal Processing
15	EC6301	Industrial Instrumentation
16	EC6403	Modern Radar Systems
17	EE2403	Analog Electronics
18	FP2201	Food Processing Operations - I
19	FP4211	Process Control and instrumentation in Food industry
20	ID6103	Form Studies
21	LS4407	Cell Biology
22	MA2203	Introduction to Probability and Statistics
23	MA4305	Numerical Analysis - II
24	ME2301	Engineering Thermodynamics
25	MM2306	Non Ferrous Metal Extraction-Principle and Practice
26	MM5211	Mechanical Working of Metallic Materials
27	MN4021	Mine Planning and Design
28	MN6201	Environmental Control and Management
29	PA2501	Evolution of Architecture - III
30	PA4501	Project Management
31	PH4003	Classical Mechanics
32	SM6111	Financial Institutions, Instruments and Markets
33	SM6421	Logistics and Supply Chain Management



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Day 4 : Date / Day of Examination : 26-Nov-2022 ( Saturday )

FIRST SESSION ( 08.30 am to 11.30 am )		
Sl.No	Subject	Subject Name
1	BM3305	Fermentation Technology
2	BM3603	Biomedical Signal Processing
3	BM6231	Computational Methods in Biomedical Engineering
4	BM6401	Advanced Recombinant DNA Technology
5	CE3301	Transportation Engineering
6	CE6233	Composite Structures
7	CE6303	Highway and Airport Pavement Materials
8	CE6436	Fluvial Hydraulics
9	CH3217	Chemical Process Technology
10	CR3105	Heat Transfer and Fluid Flow
11	CS3009	Operating Systems
12	CY3401	Fundamentals of Materials and Nanochemistry
13	CY5205	Solid State Chemistry
14	CY7306	Special Topics in Physical Chemistry
15	EC3601	Digital Signal Processing
16	EE3201	Electric Drives
17	EE6243	Soft Computing Techniques
18	EE6405	Control of Electric Drives
19	ER5201	Earth System Science
20	ER6003	Applied Hydrogeology
21	ER6011	Theoretical Meteorology
22	FP3503	Processing of Livestock, Fish and Marine Products
23	FP6435	Advanced Bakery Technology
24	HS5444	Public Economics
25	HS7205	Developmental Cognitive Neuroscience
26	HS7306	Environment and Society
27	HS7402	Economic Evaluation of Health Care
28	ID3207	Geometric and Solid Modelling
29	LS3406	Molecular Basis of Development
30	LS6004	Cell Signalling
31	MA3101	Introduction to Algebra: Group and Ring Theory
32	MA5332	Fluid Dynamics
33	MA6611	Analysis
34	ME3301	Heat Transfer
35	ME6201	Applied Elasticity and Plasticity
36	ME6235	Neural Network and Artificial Intelligence
37	ME6301	Heat Transfer – I: Conduction and Radiation Heat Transfer
38	MM3102	Phase Transformation
39	MM6523	Experimental Techniques in Materials Engineering
40	MN3203	Underground Hazards and Rescue

SECOND SESSION ( 01.30 pm to 04.30 pm )		
Sl.No	Subject	Subject Name
1	BM2101	Cell and Molecular Biology
2	BM4603	Measurements, Sensors and Transducers
3	CE4203	Advanced Design of Reinforced Concrete Structures
4	CH4213	Colloidal and Interfacial Science and Engineering
5	CH4513	Petroleum Refinery Engineering
6	CH6433	Environmental Management System
7	CR2403	Ceramic Raw Materials
8	CR4203	Bioceramics
9	CR6401	Oxide and Non-Oxide Ceramics
10	CS2005	Data Structures and Algorithms
11	CS6128	Cloud Computing
12	CS6212	Graph Theory
13	CS6312	Data Warehousing and Mining
14	CY4303	Chemical Applications of Group Theory
15	EC2601	Signals and Systems
16	EC6209	IoT and Applications
17	EC6515	Mobile Communication
18	EC6601	Advanced Digital Signal Processing
19	EE2401	Network Theory
20	ID6201	User Experience Design
21	LS2601	Basic Microbiology
22	LS4602	Microbiology
23	MA2305	Numerical Analysis
24	ME2101	Mechanics of Solids
25	MM4510	Advanced Processing of Materials
26	MM5222	Fracture, Fatigue and Wear of Metals
27	MN2001	Mine Development
28	MN5002	Computer Application in Mining
29	MN6254	Mine Fires and spontaneous heating
30	PA2601	Building Services - I
31	PA4005	Energy Efficient Architecture
32	PA4013	Introduction to Urban and Regional Planning
33	PH4005	Quantum Mechanics - I
34	SM6422	Total Quality Management and Six Sigma

41	PA3903	Housing
42	PA6405	Environmental Planning
43	PH6009	Numerical Analysis in Computer Programming
44	SM6361	Talent Management
45	SM6501	Management Information Systems





Day 5 : Date / Day of Examination : 28-Nov-2022 ( Monday )

FIRST SESSION ( 08.30 am to 11.30 am )		
Sl.No	Subject	Subject Name
1	BM6133	Nanotechnology in Medical Applications
2	CE6001	Applied Elasticity and Plasticity
3	CE6330	Planning and Design of Airports
4	CE6431	Advanced Fluid Mechanics
5	CS3061	Computer Architecture
6	EC3510	Fundamentals of Communication Systems
7	EE3000	Electrical Machines
8	EE6133	Mobile Radio Channels
9	EE6303	Nonlinear Control
10	EE6401	Machine Analysis
11	ER5001	Geochemistry
12	ER5407	Science of Climate and Climate Change
13	ER6005	Applied Isotop geology
14	ER6013	Applied Atmospheric Dynamics
15	FP6203	Transfer Processes in Food Engineering
16	HS5301	Social Institutions and Development
17	HS5413	Financial System and Development
18	HS7301	Research Methodology
19	LS3404	Evolutionary Biology
20	LS6005	Epigenetics
21	MA5303	Partial Differential Equations
22	MA6613	Functional Analysis with Applications
23	ME3161	Mechanics of Materials
24	ME6142	Fundamentals of Tribology
25	ME6241	Production Management
26	ME6341	Refrigeration and Cryogenic Systems
27	MM3109	Fundamentals of Physical Metallurgy
28	MM6529	Surface Engineering
29	PA6407	Settlement Systems
30	PH3003	Heat and Thermodynamics
31	PH6117	Introduction To Astrophysics
32	SM6601	Managerial Economics

SECOND SESSION ( 01.30 pm to 04.30 pm )		
Sl.No	Subject	Subject Name
1	BM4301	Downstream Processing and Bioseparation
2	CH6532	Safety in Chemical industries
3	CR6134	Electron Microscopy
4	CS2061	Data Structure Applications and Algorithms
5	CS4062	Fundamentals of Computer Networks
6	CS6413	Software Project, Process and Quality Management
7	EC2610	Fundamentals of Signals and Systems
8	EC6203	Reconfigurable System Design
9	EC6509	Satellite Communication
10	EC6603	Computer Vision
11	EE2400	Network Analysis
12	FP4231	Food Process Equipment and Plant Design
13	LS5410	Molecular Genetics
14	MA4107	Linear Algebra
15	ME2261	Basic Manufacturing Processes
16	MM2308	Iron Making and Steel Making
17	MN6122	Rock Slope Technology
18	MN6162	Advanced Coal Mining
19	PA4007	Green Certification Systems
20	PA4011	Disaster Management and Mitigation
21	PH2007	Electrostatics and Magnetostatics
22	SM6121	Financial Derivatives
23	SM6241	Industrial Marketing
24	SM6351	Employee Compensation and Benefits Management
25	SM6441	Production Planning and Control

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Day 6 : Date / Day of Examination : 29-Nov-2022 ( Tuesday )

FIRST SESSION ( 08.30 am to 11.30 am )		
Sl.No	Subject	Subject Name
1	CE3401	Water Resources Engineering
2	CH3311	Chemical Engineering Mathematics
3	CR3401	Refractory Technology
4	CS3007	Compiler Design
5	EC3303	Instrumentation Devices
6	EC3505	Microwave Engineering
7	EE3401	Embedded Systems
8	EE4405	Digital Communication
9	ER5041	Isotope Geology
10	ER5601	Numerical Weather Prediction
11	FP3601	Food Packaging and Storage Engineering
12	HS7100	English for Research Writing
13	ID3301	Manufacturing Process
14	ME3303	Fluid Dynamics and Hydraulic Machines
15	ME6237	Production Planning and Control
16	MN3207	Coal and Mineral Processing Technology
17	PH5006	Analog and Digital Electronics

SECOND SESSION ( 01.30 pm to 04.30 pm )		
Sl.No	Subject	Subject Name
1	BM4601	Medical Embedded Systems
2	CE4401	Irrigation Engineering
3	CH4317	Project Engineering
4	CR4205	Composite Materials
5	CR4401	Industrial Applications of Refractories
6	CS6217	Biometric Security
7	EC6213	Micro-Electronic Devices and Applications
8	EC6305	Analytical Instrumentation
9	EC6501	Data Communication Networks
10	FP4213	Food Process Modeling and Simulation
11	HS1311	Ethical Leadership and Literature
12	HS1317	Introduction to the Metaphysics of Sanskrit Language
13	HS1321	Introduction to Psychology
14	HS1331	Introduction to Society and Culture
15	HS1340	Principles of Economics
16	MM5523	Surface Engineering
17	MN3006	Mineral Resource Evaluation and Geostatistics
18	PA2801	Climate-Responsive Architecture
19	SM6211	Consumer Behaviour and Marketing Research

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Day 7 : Date / Day of Examination : 30-Nov-2022 ( Wednesday )

FIRST SESSION ( 08.30 am to 11.30 am )		
Sl.No	Subject	Subject Name
1	CE6133	Earthquake Geotechnical Engineering
2	CS6401	Advanced Software Engineering
3	EE3403	Digital Signal Processing
4	EE6101	Advanced Communication Techniques
5	EE6203	Power System Dynamics
6	ER5411	Tropical Meteorology
7	HS7307	Tribal Development in India
8	LS6013	Research Methodology
9	MA6645	Group Theory and its Application
10	ME6143	Composite Materials
11	ME6148	Nonlinear Oscillation
12	ME6337	Experimental Methods in Thermal Engineering
13	ME6535	Vacuum Technology
14	PH2003	Electricity and Magnetism
15	PH5001	Nuclear and Particle Physics
16	SM6611	Business Research Methodology

SECOND SESSION ( 01.30 pm to 04.30 pm )		
Sl.No	Subject	Subject Name
1	BM2003	Medical Science II
2	CH4313	Computational Fluid Dynamics
3	CH6103	Advanced Mass Transfer
4	CR4201	Nanoceramics
5	CR6131	Testing and Characterization
6	CR6201	Advanced Bio-Ceramics
7	CS6218	Machine Learning
8	EC6207	Modeling and Circuit Simulators for VLSI Systems
9	EC6308	Medical Instrumentation
10	EC6401	Microwave Devices and Circuits
11	EC6609	Soft Computing
12	MN6101	Rock Excavation Engineering
13	PH3006	Basic Mathematical Physics
14	SM6221	Strategic Brand Management

  
Jt./Dy. Asst. Registrar(Academic)

Copy to:

1. All Notice Boards (Institute/Halls of Residence).
2. All Deans/ Chief Warden.
3. Registrar.
4. Professor In-charge Examinations
5. All Wardens of Halls.

6. All HODs are requested to send the question papers in sealed packets ( packets supplied by Academic Office) containing required number of question papers Hall wise ( actual student strength in the hall + 05 extra) as per the Hall arrangement list latest by **15 Nov 2022**. On the packet containing questions the HODs/ concerned faculty members are requested to clearly state the list of requisite tables, codes, charts etc, to be supplied to the student by the academic office during the examination.

[A sample copy of the relevant material may be attached on the question packet or may be sent to the undersigned separately for official record and timely supply]

**\*\* All faculties are requested to mention their mobile number on the question packets for any emergency queries during the examination.**

7. Security Officer.
8. In-charge (Technical Service).