



**M.Sc. 4<sup>th</sup> Sem.(CBCS) WINTER, 2023**  
(115 To 132 & 133 )

**RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY**  
**M.Sc. 4Th SEMESTER (CBCS) EXAMINATION OF WINTER, 2023**

**:=: PROGRAMME ( WRITTEN ) :=:**

**TIME : - 2.00. P.M. To 5.00. P.M.**

Sr. No	Subject	Day Date Paper	Thursday 26-10-2023 I	Saturday 28-10-2023 II	Monday 30-10-2023 III	Wednesday 01-11-2023 IV
1.	Physics	Nuclear and Particle Physics		Solid State Physics	<b>Core Elective</b> 1. Materials Science – II 2. X-rays – II 3. Nanoscience and Nanotechnology – II 4. Atomic and Molecular Physics– II 5. Applied Electronics – II 6. Methods of Theoretical Physics –II 7. Nonlinear Dynamics-II	<b>FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS</b> Spectroscopic Application <b>OR</b> Optics and Optical Instruments <b>Subject Centric Core</b> 1. Nonlinear Geophysics 2. Experimental Techniques In Physics 3. Communication Electronics 4. Electro Acoustics
2.	Chemistry	Special I – Inorganic / Organic / Physical / Analytical		Special II – Inorganic / Organic / Physical / Analytical	Elective –Nuclear / Environmental / Polymer / Medicinal	<b>FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS</b> Applied Anal. Chemistry-II <b>Core Subject Centric- Spectroscopy-II</b>
3.	Bio-Chemistry	Advanced Clinical Biochemistry		Advanced Immunology	<b>Elective</b> A) Toxicology (Clinical Research) <b>OR</b> B) Nutrition (Applied Nutritional Biochemistry)	<b>FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS</b> Enzymology <b>Core Subject Centric</b> Bioresearch Techniques II
4.	Microbiology	Virology(VIR)		Microbial Fermentation Technology (MFT)	<b>Elective :- Any One Of The Following</b> 1) Microbial Diversity, Evolution and Ecology (MDEE) 2) Bioinformatics (BIF)	<b>FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS</b> 1. Advance Microbiology <b>Core Subject Centric</b> Vaccines And Delivery System
5.	Botany	Cell and Molecular Biology-II		Plant Biotechnology and Plant Breeding	<b>Elective</b> 1) Molecular Biology and Plant Biotechnology 2) Reproductive Biology of Angiosperms 3) Advanced Psychology and Hydrobiology 4) Mycology and Plant Pathology 5) Palaeobotany 6) Palynology 7) Plant Physiology	<b>FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS</b> 1) Applied Botany <b>Core Subject Centric- Plant Resources</b>

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6.	Zoology	Biotechnique, Biostatistics ,Ethology,Toxicology and Bioinformatics	<b>Special Group – Paper – II</b> <b>Elective</b> Entomology Fish and Fisheries Mammalian Reproductive Physiology (MRP) Animal Physiology Cell Biology Fresh Water Zoology Aquaculture Environmental Biology Sericulture	<b>Special Group – Paper – III</b> <b>Elective</b> Entomology Fish and Fisheries Mammalian Reproductive Physiology(MRP) Animal Physiology Cell Biology Fresh Water Zoology Aquaculture Environmental Biology Sericulture	<b>FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS</b> Applied Zoology Applied and Industrial Entomology Applied Fresh Water Fisheries Applied Human Physiology <b>Core Subject Centric -2</b> Chronobiology & Radiation Biology	
7.	Environmental Science	Air and Noise Pollution Control Technology	Solid and Hazardous Waste Management	<b>Elective - I</b> Environment Impact Assessment and Legislation <b>Elective –II</b> Environmental Management	<b>FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS</b> Fundamentals of Environmental Science-II <b>OR</b> <b>Core Subject Centric</b> Disaster Management	
8.	Statistics	Multivariate Analysis	Computational Statistics	<b>Elective</b> Operation Research (OLD) Reliability Theory Data Mining Time Series Analysis Industrial Statistics (NEW)	<b>FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS</b> Applied Statistics Bio-Statistics <b>Core Subject Centric</b> Industrial Statistics (OLD) Actuarial Statistics Stochastic Models In Finance Statistical Pattern Recognition Operation Research (NEW)	
09.	Mathematics	Dynamical Systems	Partial Differential Equations	Advanced Numerical Methods	<b>FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS</b> 1. Elementary Discrete Mathematics - I 2. Fuzzy Mathematics II (Old Course) 3. Linear Programming (Old Course) <b>Core (Subject Centric) .Operations Research II</b> <b>Paper V:- Fridav, 03-11-2023</b> <b>Core Elective Paper (opt any one of the following)</b> 1. Fluid Dynamics – II 2. Cosmology 3. Cryptography 4. Operator theory 5. Algebraic Topology-II	
10.	Electronics	Electromagnetic Fields and Antennas	Digital Communications	<b>Elective</b> 1. Microwave and Optical Communication 2. Computer Communication	<b>FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS : Pc and Pc Interfacing</b> <b>Core (Subject Centric)</b> Mobile and Satellite Communication	

Sr. No	Subject	Day Date Paper	Thursday 26-10-2023 I	Saturday 28-10-2023 II	Monday 30-10-2023 III	Wednesday 01-11-2023 IV
11.	Computer Science	Data Mining		Artificial Intelligence & Expert System	<b>Elective</b> Design and Analysis of Algorithm Embedded System Pattern Recognition	<b>FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS</b> Advances in Information Technology Enterprise Resource Planning Supply Chain Management Total Quality Management Banking Operation And Services Information Security And Cyber Law <b>Subject Centric</b> 1. Parallel Computing 2. Mobile and Cyber Forensics
12.	Molecular Biology and Genetic Engineering	Plant & Animal Tissue Culture		Recombinant DNA Technology-II	<b>Elective</b> A) Plant Genetic Engineering II B) Molecular Diagnostics Methods- II C) Bioinformatics and Datamining II	<b>FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS</b> Recombinant DNA Technology And Plant Genetic Engineering <b>Core Subject Centric</b> Applied Genetics
13.	<b>M.Sc. Tech.</b> Applied Geology	Mineral Exploration (4)		Elements of Mining and Drilling Techniques(3+1)	Geomorphology, Remote Sensing and GIS(1+2+1)	Fuel Geology (Coal, Petroleum and Nuclear) (2+1+1)
14.	Information Technology	Data Warehousing and Data Mining		Artificial Intelligence and Expert System	<b>Core Elective</b> 1. Design and Analysis of Algorithm 2. Cloud Computing 3. Mobile Computing	<b>FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS</b> 1. Advances in Information Technology 2. Banking Operations and Services 3. Information Security and Cyber Law <b>Core Subject Centric</b> 1. Enterprise Computing 2. Mobile and Cyber Forensics
15.	Biotechnology	Animal Biotechnology		Biostatistics, Bioinformatics, Ethics & Patenting	<b>Elective</b> A) Industrial Biotechnology II <b>OR</b> B) Environmental Biotechnology II	<b>FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS</b> Basic rDNA Technology <b>Core Subject Centric</b> Therapeutic Medical Biotechnology
16	Geology	Ore Geology and Ore Microscopy (3+1)		Indian Mineral Deposits and Mineral Economics (3+1)	<b>Elective</b> 1. Exploration Geochemistry (4) 2. Quaternary Geology & Limnogeology(3+1) 3. Basin Analysis and Sequence Stratigraphy(2+2) 4. Marine Geology and Oceanography(2+2)	<b>FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS</b> Paleobiology <b>Core (Subject Centric)</b> Fuel Geology (Coal, Petroleum & Nuclear)

Sr. No	Subject	Day Date Paper	Thursday 26-10-2023 I	Saturday 28-10-2023 II	Monday 30-10-2023 III	Wednesday 01-11-2023 IV
17.	Forensic Science	Criminology and Forensic Law	<b>Special Paper-I</b> 1. Questioned Document Analysis-II 2. Forensic Anthropology and Odontology 3. Instrumentation 4. Steganography and Watermarking 5. Forensic Physics	<b>Special Paper-II</b> 1. Advanced Fingerprint Development Methods II 2. Microbial Forensics and Bioinformatics 3. Advanced Forensic Chemistry 4. Mobile and Smart Phone Forensics 5. Ballistics Modeling and Analysis	<b>FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS</b>  <b><u>Paper V :- Friday, 03-11-2023</u></b> <b>Special Paper-III</b> 1. Forgery and its Forensic Detection 2. DNA Fingerprinting 3. Advanced Forensic Toxicology 4. Biometrics 5. Weapon Systems and Ballistics Measurements  <b><u>Paper VI :- Monday , 06-11-2023</u></b> <b>Special Paper-IV</b> 1. Automated Fingerprint Identification System 2. Wildlife and Environment Forensic 3. Pharmaceutical and Narcotic Drugs 4. Malware Forensics 5. Rocket Ballistics	
18.	Medicinal Plant	Herbal Drugs Technology & Development (HDD)	Drug Standardization and Regulation (DSR)	<b>Core Elective</b> Natural Plant Products & Photochemistry-II (NPP-II) <b>OR</b> Forensic and Industrial Botany-II	<b>FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS</b> Ethnobotany (ETH) <b>OR</b> <b>Core Subject Centric</b> Cultivation and Utilization of Aromatic Plants	

**FOR FOUNDATION COURSE OPTIONAL – AS PER ENCLOSED LIST OF FOUNDATION COURSES OF 42 SUBJECTS**

Sr.No.	Subject	4 <sup>th</sup> Papers of Semester-4
1	Mathematics	Mathematics-II
2	Physics	Physics-II
3	Chemistry	Chemistry-II
4	Bio-Technology (Ad-hoc)	Bio-Technology-II
5	Computer Science	Computer Science-II
6	Environmental Science	Environmental Science-II
7	Botany	Botany-II
8	Zoology	Zoology-II
9	Statistic	Statistics-II
10	Business Management	Business Management -II
11	Accountancy	Account & Statistics-II
12	Managerial Skill	Managerial Skills-II

13	Education Technology & Management Skills	Education Technology & Management Skills-II
14	Communication Skill	Communication Skills-II
15	Sanskrit	Sanskrit-II
16	German	German-II
17	French	French-II
18	Law	Law-II
19	Pharmaceutical Sciences	Pharmaceutical Sciences-II
20	Life skills	Life Skills-II
21	Economics	Economics-II
22	Political Science	Political Science-II
23	Sociology	Sociology-II
24	Psychology	Psychology-II
25	Philosophy	Philosophy-II
26	History	History-II
27	Public Admn	Public Admn -II
28	Buddhist Studies	Buddhist Studies-II
29	Gandhian Thought	Gandhian Thought-II
30	Dr. Ambedkar Thought	Dr. Ambedkar Thought-II
31	Rashtrasant Tukdoji Maharaj Thought	Rashtrasant Tukdoji Maharaj Thought-II
32	Travel & Tourism	Travel & Tourism-II
33	Personality Development	Personality Development-II
34	Cosmetic Technology	Cosmetic Technology-II
35	Hospitality Management	Hospitality Mgt. –II
36	Chemical Engineering	Chemical Engineering-II
37	Chemical Technology	Chemical Technology-II
38	Civil Engineering	Civil Engineering-II
39	Electrical Engineering	Electrical Engineering-II
40	Mechanical Engineering	Mechanical Engineering-II
41	Electronics Engineering	Electronics Engineering-II
42	Pali Prakrit	Pali Prakrit-II

M.Sc. 6<sup>TH</sup> SEMESTER(CBCS) EXAMINATION OF WINTER, 2023  
=: PROGRAMME ( WRITTEN ) :=

TIME : - 9.30. A.M. To 12.30. P.M.

Sr. No	Subject	Day Date Paper	Friday 27-10-2023 I	Tuesday 31-10-2023 II	Thursday 02-11-2023 III	Saturday 04-11-2023 IV
1.	M.Sc. (Tech.) Applied Geology	Engineering Geology and Geotechniques.		Applied and Industrial Micropaleontology .	Core Elective 2. Optional Any One 1. Petroleum Exploration 2. Basin Analysis and Sequence Stratigraphy 3. Marine Geology and Oceanography	Foundation Course 2. Geology 2 ; Paleobiology OR Core Subject Centric 2 1) Geodesy and Mapping

GENERAL INSTRUCTIONS FOR SEATING ARRANGEMENT

The name of the College Centre is already printed on the Admission Card of each candidate. However, it is notified for general information of the candidates that :-

The seating arrangement for the Centre will be notified separately seven days prior to the commencement of the written examination at the respective College / Centre. The candidates concerned will also be able to get the necessary information from that chart of seating arrangement sent to the concerned College by University.

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Nagpur

Date: 18<sup>th</sup> September 2023  
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Sd/-  
Director  
Board Of Examination & Evaluation  
Rashtrasant Tukadoji Maharaj  
Nagpur University