S–3986

Sub. Code
23MGE1C1

M.Sc DEGREE EXAMINATION, NOVEMBER 2024

First Semester

Geology

PHYSICAL GEOLOGY AND GEOMORPHOLOGY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions

1. What are the layers of Earth?
2. Lithosphere.
3. Define orogeny and epeirogeny.
4. Outwash plain.
5. Latitude and longitude.
6. Define V-shaped valley.
7. Define moraine.
8. Define stalagmite and stalactite.
9. Loess deposits.
10. Coastal terrace.

Part B (5 × 5 = 25)

Answer **all** the questions choosing either (a) or (b).

11. (a) Briefly describe the formation of oceanic trenches and volcanic arcs.

Or

(b) Explain the concept of isostasy and its role in shaping the Earth's surface features.

12. (a) Explain how glaciers create unique landforms compared to rivers.

Or

(b) Describe the role of weathering in shaping coastal landforms.

13. (a) Analyze the causes and types of mass movements, such as landslides and mudflows.

Or

(b) Discuss the factors that influence the rate of weathering and provide specific examples.

14. (a) Explain the processes of wind erosion, transportation, and deposition.

Or

(b) Explain the different types of volcanoes and the materials they erupt.

15. (a) How glaciation and deglaciation in river morphology of discharge, and sediment deposition.

Or

(b) Discuss how precipitation and wind patterns influenced the formation and migration of sand dunes.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss the concept of paleomagnetism and its application in understanding continental drift.

17. Why the coastal regions often more prone to large earthquakes and tsunamis?

18. Explain the transportation, deposition and how lead to the formation of various fluvial landforms.

19. Explain the formation of different coastal landforms like beaches, cliffs, sea stacks and tombolos.

20. Discuss the formation of raised beaches, submerged landscapes and coastal terraces.

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S–3987	Sub. Code
	23MGE1C2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024.

First Semester

Geology

MINERALOGY AND INSTRUMENTATION TECHNIQUES

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is the axial ratio of Barite and Axinite?

2. Find out the common zone symbol between the faces hkl = 101^010 and 001^120 by using Zone symbol formula

3. What are the two dimensional and three dimensional lattices?

4. What is great circle and short circle in stereographic projection?

5. What are Potash Feldspars, mention the chemical composition?

6. Define single chain inosilicate.

7. Define straight and inclined extinction.

8. What is Isotropism and give two Isotropic minerals?

9. Define Flame photometer and which elements are identified through Flame photometer?

10. Define Spectroscopy.

Part B $(5 \times 5 = 25)$

Answer **all** questions, choosing either (a) or (b).

11. (a) Describe the external crystallographic characters of Galena.

Or

(b) Explain the external crystallographic characters of Zircon.

12. (a) Write note on Shoenflies notation.

Or

(b) Describe Spherical projection.

13. (a) What is exsolution and illustrate with examples?

Or

(b) Describe the Forsterite and Fayalite mineral paragenesis.

14. (a) Give a note on Pleochroism.

Or

(b) Write note on Birefringence and Order of Interference.

15. (a) Write note on X — Ray Diffraction.

Or

(b) Elucidate UV spectroscopy.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Describe monoclinic system.

17. Write an essay on Napier theorem and its applications.

18. Explain the Garnet group of minerals and their paragenesis.

19. Describe the optical microscopic characters in polarized light and cross Nicols positions.

20. Explain Mass Spectroscopy and UV Mass Spectroscopy.

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S–3988

Sub. Code
23MGE1E1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

First Semester

Geology

Elective : STRATIGRAPHY OF INDIA AND ITS APPLICATIONS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Write note on Litho unit.
2. Define unconformity.
3. Give the lower gondwana series.
4. What are productus shales?
5. What is a bed?
6. What is meant by chronostratigraphy?
7. What is original horizontality?
8. Discuss the strata and stage.
9. Uses of C^{14}.
10. What is magnetostratigraphy?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Describe the minerals wealth in Archaean.

Or

(b) Discover the Ordovician system.

12. (a) Explain the structure of Gondwana basin.

Or

(b) Summarise about Divonian period.

13. (a) Write notes on the Infra and inter-trappean beds.

Or

(b) Discover the economic minerals in deccan traps.

14. (a) Develop the Global standard section and point.

Or

(b) Enumerate the stratigraphy units.

15. (a) Describe the mangneto stratigraphy.

Or

(b) Elaborate the sea level fluctuations.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Discuss about the Cambrian salt ranges.

17. Elaborate the cretaceous of Trichinopoly.

18. Interpret the origin of the himalaya.

19. Discuss about the geological time scale.

20. Describe the application of radiometric dating.

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S–3989	Sub. Code
	23MGE1E2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

First Semester

Geology

Elective : RECENT TRENDS IN PALAEONTOLOGY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Define Species and Genera.

2. What are stable Isotopes and mention any one application of stable Isotopes?

3. Define Stromatolite of Precambrian.

4. Define Tracks and Coprolites.

5. What is Plant grade and Herbivorous?

6. What are the Miocene Equus fossils?

7. What is the suture pattern of Ammonites, during Permo Carboniferous and Triassic period?

8. Define pedicle opening.

9. What are the typical morphological characters noticed in Textularia and Nodosaria?

10. Define Carapace of Ostracod.

Part B (5 × 5 = 25)

Answer **all** the questions choosing either (a) or (b).

11. (a) Tabulate the distinction between Regular and Irregular Echinoids.

Or

(b) Tabulate the differences between Apes and Man.

12. (a) Describe the evolutionary principles Heredity and Variation.

Or

(b) What is the uses of fossils?

13. (a) Write note on classification of Vertebrate Man.

Or

(b) Write note on Ramapithecus.

14. (a) Give a note on Asconoid canal system in Porifera.

Or

(b) Write note on classification of Hemichordata.

15. (a) What are the sampling methods in Micro palaeontological techniques?

Or

(b) Explain the dentitions of Ostracod.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Describe the morphology of Gondwana plant fossils.

17. Write an essay on Major events in the history of Precambrian and Phanerozoic life.

18. Give an account on Evolution of Eqaus.

19. Trace the evolutionary trends noticed in Trilobite and add a note on bio stratigraphic importance.

20. Describe the morphology, classification and geological history of foraminifera.

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S–3990

Sub. Code
23MGE2C1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Second Semester

Geology

STRUCTURAL GEOLOGY AND GEOTECTONICS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Define shearing strength.
2. Explain the fault plain.
3. Discuss the hanging wall and foot wall.
4. What is fault zone?
5. Write the oblique faults.
6. What is a columnar joint?
7. Define convection currents.
8. Explain the gorges.
9. Write the magnetic reverse.
10. What is island arc?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Analyze the geometry and mechanics of fracturing in rocks.

Or

(b) Differentiate between L-, L-S-, and S-tectonic fabrics.

12. (a) Describe the principles and methodologies of petrofabric analysis.

Or

(b) Classify the symmetry of movement.

13. (a) Explain the Methods of neotectonics.

Or

(b) Synthesize about the Foliation and lineation.

14. (a) Write notes on the continental drift.

Or

(b) Classify any two major tectonic features.

15. (a) Discuss about the oceanic islands.

Or

(b) Explain the deep sea trenches.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss the fundamental principles of stress and strain in rock mechanics.

17. Examine the Geometry of brittle-ductile and ductile shear zones.

18. Evaluate the Indian evidences of neotectonics.

19. Enumerate the notes on geophysical evidences of Continental drift.

20. Examine the Paleomagnetism.

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S–3991

Sub. Code
23MGE2C2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Second Semester

Geology

APPLIED PETROLOGY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. What is mean by facies?
2. What are the various types of sedimentary structure?
3. Explain the Eutectic point?
4. Explain the Geothermal gradient?
5. What is an Assimilation process?
6. What is Magmatic Differentiation?
7. Explain the metamorphic Zones?
8. How do fluids influence in metamorphic processes?
9. What does the term sorting refer to?
10. How does shale differ from a mudstone?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Define the Magma evolution and differentiation.

Or

(b) Write the Viscosity, temperature and pressure relationships in magmas.

12. (a) Give a notes on Deccan Traps

Or

(b) Classicfy the Petrological implications of silicate systems.

13. (a) Explain the Agents of Metamorphism

Or

(b) Give details about the facies concepts of metamorphism

14. (a) Describe the Tectonics and Sedimentation

Or

(b) Classify the sedimentary rock structure

15. (a) Discuss about the marine and continental evaporates

Or

(b) Explain the application of trace elements.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Describe the notes on structure and textures of Igneous rock

17. Examine the petrogenesis of anorthosites and charnockite

18. Evaluvate the types of metamorphism

19. Synthesize about the sedimentary basins of India

20. Examine the sedimentary environments and its significance

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S–3992	Sub. Code
	23MGE2E1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Second Semester

Geology

Elective : APPLIED REMOTE SENSING AND GIS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Write notes on supervised classification.
2. List the importance of temporal resolution.
3. NDVI and its role in vegetation monitoring.
4. Applications of GIS in disaster management.
5. Advantages of drone in aerial mapping.
6. Spatial analysis techniques in GIS.
7. Define DEM.
8. Define ground truth data.
9. What is data fusion?
10. GIS in natural resource management, with examples.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Describe the types of aerial photographs.

Or

(b) Discuss the applications of thermal remote sensing.

12. (a) Describe briefly what are the key elements of image interpretation?

Or

(b) Explain the difference between raster and vector data in GIS.

13. (a) How do remote sensing and GIS contribute in lithological mapping?

Or

(b) Explain Stefan-Boltzmann's law and its significance in satellite remote sensing.

14. (a) Define LIDAR remote sensing and provide the example of its application in mapping.

Or

(b) Describe the components of a GIS system and their roles in data management and analysis.

15. (a) How does contrast stretching enhance the visual interpretation of satellite imagery?

Or

(b) Explain a relevant application of the chosen remote sensing system in resource management.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Discuss how a pocket stereoscope can be used to analyze a pair of overlapping aerial image

17. Describe about spectral, radiometric, and temporal variation used to characterize satellite data.

18. Explain two specific techniques used for image enhancement and how it improve the image analysis.

19. Differentiate between two types of satellite orbits commonly used for Earth observation.

20. Discuss elaborately the advantages and limitations of using digital image processing.

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S–3993

Sub. Code
23MGE2E2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Second Semester

Geology

ENVIRONMENTAL EARTH SCIENCE

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define environmental monitoring
2. What are the benefits of air quality monitoring?
3. How to reduce indoor air pollution
4. Define ozone depletion
5. Give few example of a renewable energy source
6. Define waste management?
7. What are the different stages of the waste hierarchy?
8. Two health problems associated with lead poisoning.
9. What is the main source of exposure to asbestos?
10. What are the potential benefits of zinc for human health?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Discuss the importance of maintaining a healthy and balanced environment for sustaining life.

Or

(b) Describe different methods used for air quality monitoring and water quality testing.

12. (a) Analyze the connection between various anthropogenic activities.

Or

(b) Explain the purpose of air quality standards and discuss the challenges.

13. (a) Explain the difference between classical smog and photochemical smog.

Or

(b) Discuss the chemical reactions involved in the ozone and PAN in photochemical smog.

14. (a) Evaluate the waste incineration and discuss for minimizing air pollutant.

Or

(b) Explain the different types of recycling and discuss the challenges.

15. (a) Explain the geological processes can lead to the contamination of drinking water with fluoride.

Or

(b) Describe the health effects associated with different types of asbestos fibers.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Analyze the factors contributing to water scarcity and discuss the sustainable water management.

17. Discuss the environmental and health impacts of acid rain on ecosystems and human populations.

18. Discuss the advantages and disadvantages of different renewable energy sources.

19. Education and public awareness are how crucial for promoting the waste management practices.

20. Explain the health effects of exposure to hexavalent chromium compared to trivalent chromium.

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S–3994

Sub. Code
23MGE2S1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Second Semester

Geology

DISASTER MANAGEMENT

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Define global warming.

2. Define Hazard.

3. What are the causes of floods?

4. What are the conditions to form a cyclone?

5. List the different types of volcanoes.

6. What are the effects of droughts?

7. List the factors can trigger landslides.

8. Write notes on flash flood.

9. Define magnitude and intensity.

10. Write the factor of sea level rises.

Part B (5 × 5 = 25)

Answer **all** the questions choosing either (a) or (b).

11. (a) Describe the physical and geodynamic characteristics of Tsunami.

Or

(b) Discuss the physical and geodynamic characteristics of storm surges.

12. (a) Evaluate the scientific evidence supporting the reality of human-caused climate change.

Or

(b) Describe the challenges associated with renewable energy sources to mitigate climate change.

13. (a) Describe the concept of risk modeling in the context of natural hazards.

Or

(b) How can GIS used to integrate various data layers to create risk models for different hazard?

14. (a) Compare and contrast the key aspects of pre-disaster preparedness and post-disaster response.

Or

(b) Analyze the importance of effective communication and coordination from stakeholders.

15. (a) Describe the process for developing a comprehensive hazard mitigation plan.

Or

(b) What key factors and stakeholders need to be considered when creating a plan for National disaster?

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Discuss the factors contributing to the trend and analyze different strategies for disaster mitigation.

17. Explain how climate change can increase extreme weather events in droughts and forest fires.

18. Discuss how remote sensing and GIS can be used to identify vulnerable zones.

19. Analyze the importance of coastal regulations in managing development and minimizing risks.

20. Discuss how effective disaster recovery efforts should address the needs of vulnerable populations.

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S–3995

Sub. Code
23MGE3C1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Third Semester

Geology

ECONOMIC GEOLOGY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Ophiolite setting.
2. Define gangue and Tenor.
3. Mention the gosson colour of Galena and Chalcopyrite.
4. Geological guides.
5. Which is important iron producing states in India
6. Write the diagnostic properties of psilomelane.
7. Define Permeability.
8. Largest oil basin in India.
9. Coal capital of India.
10. Expand NGRI and BSIP.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Give a short note on skarn formation.

Or

(b) What are exogenic and endogenic process?

12. (a) Short notes on green field exploration.

Or

(b) Explain the geochemical exploration.

13. (a) Write in instrumental techniques of detection of radioactive minerals.

Or

(b) Give a shot note on distribution of radioactive minerals in India.

14. (a) Give a brief idea about coal preparation.

Or

(b) Write a short note on classification of coal

15. (a) Write the methods of coal prospecting.

Or

(b) Write the note on geological investigation in mining industry.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Write an essay on the late magmatic deposits.

17. Explain the principles of mineral prospecting and explorations.

18. Give a brief essay on radioactive minerals distribution in India.

19. Discuss the techniques and methods of petroleum exploration.

20. Write an elaborate note on various role of geologist in industrial sector.

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S–3996

Sub. Code
23MGE3C2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Third Semester

Geology

GEOPHYSICS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer ALL questions.

1. Define geophysical anomaly.

2. What is radioactivity?

3. Explain Geoid.

4. What is a gravimeter?

5. State Ohm's law.

6. What are the factors that affect the resistivity of rocks and soils?

7. Define Poisson's ratio.

8. Differentiate between body waves and surface waves.

9. What is paleomagnetism?

10. Explain the magnetic susceptibility of rocks.

Part B (5 × 5 = 25)

Answer **all** the questions, choosing either (a) or (b).

11. (a) Describe the factors that control the physical properties of rocks and minerals.

Or

(b) Explain the applications of radiometric methods in geological exploration.

12. (a) Explain the basic principles of gravity prospecting.

Or

(b) Discuss the applications of gravity methods in exploration.

13. (a) Describe the field procedures for conducting electrical profiling in resistivity surveys.

Or

(b) Describe the field procedures for conducting electrical sounding in resistivity surveys.

14. (a) Write a note on the types of seismic waves.

Or

(b) Outline the instruments used for seismic survey.

15. (a) Explain the basic principles of magnetic prospecting.

Or

(b) Explain airborne magnetic survey.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Write a detailed account on the surface and subsurface geophysical exploration methods and their applications.

17. Explain the interpretation of gravity anomalies above spherical, cylindrical, and sheet bodies. How does gravity prospecting help in understanding subsurface structures?

18. Illustrate the different electrode configurations used in resistivity surveys with sketches.

19. Describe the basic principles of seismic refraction and seismic reflection and their applications in subsurface exploration.

20. Write an account on the magmatic data collection, corrections, interpretation and the instruments employed in magnetic prospecting.

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S–3997

Sub. Code
23MGE3E1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Third Semester

Geology

Elective: GEOCHEMISTRY

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions

1. Define solar radiation.
2. Distinguished meteorites and comets.
3. Define entropy.
4. Examples of REE.
5. Define fugacity.
6. Isobaric process.
7. Define zeroth law of thermodynamic.
8. Example of geobotanical indicators.
9. Radiogenic isotopes.
10. Why the 87 Sr dating method is not suitable for determining the age of very old rock?

Part B $(5 \times 5 = 25)$

Answer **all** questions choosing either (a) or (b).

11. (a) Write a short note on compositions of the planets.

Or

(b) Explain brief note on Mantle and its composition.

12. (a) Give a short note on volatile elements on Earth.

Or

(b) What are REE and list the uses of them?

13. (a) Explain the third law of thermodynamic.

Or

(b) Give a note on chemical potential in thermodynamics.

14. (a) Write a short note on biochemical exploration.

Or

(b) Examine the interpretation methods of anomalies.

15. (a) Write a note on application of stable isotopes.

Or

(b) Give short note on radiogenic isotopes.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Write an essay on major and trace element composition of the crust.

17. Explain the Goldsmith classification of elements.

18. Explain the Gibbs phase rule and its applications.

19. Write an essay on principles of geochemical prospecting.

20. Describe the applications of stable isotopes.

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S–3998

Sub. Code
23MGE3S1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

Third Semester

Geology

PETROLEUM EXPLORATION AND MUD LOGGING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions

1. Define hydrocarbon traps.
2. Reservoir fluids.
3. Define Mud Losses.
4. Explain vertical drilling.
5. What does QHSE mean?
6. What is cycle time?
7. Define mud density.
8. What does the caliper log show?
9. What is MDI?
10. Explain Self-potential log.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Describe the seismic exploration and its advantage in petroleum exploration.

Or

(b) Explain the various modes of the occurrence of petroleum.

12. (a) What do you mean by well logs? Enlist different methods of well logging.

Or

(b) Write the short notes on bore hole environment.

13. (a) Explain every stage of the coring operation.

Or

(b) Write a note on role and responsibilities of well site geologist.

14. (a) Explain the mud logging sensors and its working principle.

Or

(b) Give a short note on Hydrocarbon Gas Analysis.

15. (a) Write a short note on Uses of electrical logging.

Or

(b) Explain: (i) MWD (ii) LWD

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain the geophysical prospecting methods in hydrocarbon exploration.

17. Write an essay on an oil well drilling complication.

18. Explain the brief note on drill cutting analysis in mud logging.

19. Enumerate the geological surveillance in mud logging.

20. Explain the working principle and geological interpretation on basic electro Log.

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