

**R6698**

**Sub. Code**

**464201**

**M.Sc. DEGREE EXAMINATION, APRIL – 2022**

**Second Semester**

**Applied Geology**

**IGNEOUS AND METAMORPHIC PETROLOGY**

**(CBCS – 2019 onwards)**

Time : 3 Hours

Maximum : 75 Marks

Draw diagram wherever necessary.

**Part A**

(10 × 2 = 20)

Answer **all** the questions.

1. Explain : CIPW norms.
2. Define : Assimilation.
3. What are pillow basalts?
4. Formation of still water complex.
5. Discuss : Ketazone.
6. Distinguish : (any two points) Schistose and Gneissose texture.
7. Write about palimpsest textures.
8. Define : Phase rule.
9. What are eclogites?
10. Explain charnockitisation.

**Part B**

(5 × 5 = 25)

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

11. (a) Write QAPF diagram for Igneous rocks with respect to mineralogical composition.

Or

- (b) Niggli's classification of Igneous rocks.

12. (a) Write about Fractional crystallisation of Igneous rocks.

Or

- (b) Enumerate Ternary magma system.

13. (a) Discuss about types of metamorphism.

Or

- (b) Brief about contact metamorphic zones.

14. (a) Explain : Goldschmidt's phase rule.

Or

- (b) Discuss AFM diagram.

15. (a) Discuss origin of Eclogite.

Or

- (b) Write about Amphibolites.

**Part C**

(3 × 10 = 30)

Answer any **three** questions.

16. Explain about evolution and differentiation of magma.  
17. Explain about the petrogenic provinces of Deccan traps.  
18. Discuss about cataclastic and regional metamorphism.

19. Bring out the role of metamorphism in plate tectonics.
  20. Discuss about the Palingenesis and Anataxis.
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**R6699**

**Sub. Code**

**464202**

**M.Sc. DEGREE EXAMINATION, APRIL – 2022**

**Second Semester**

**Applied Geology**

**SEDIMENTARY PETROLOGY**

**(CBCS – 2019 onwards)**

Time : 3 Hours

Maximum : 75 Marks

**Part A**

(10 × 2 = 20)

Answer **all** the questions.

Write a short note on the following :

1. Quartz Wacke
2. Breccia
3. Plutonic sediments
4. Micrite and Sparite
5. Turbulent flow
6. Capacity and competency of sediments
7. Loess
8. Aeolian deposits
9. Bromoform
10. Characteristic features of heavy minerals.

**Part B**

(5 × 5 = 25)

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

11. (a) Describe the process of formation of Kaolinite.

Or

- (b) What are the factors controlling the deposition of Limestone?

12. (a) Write a note on Phosphorites and Evaporates.

Or

- (b) Discuss about the process of formation of ripples.

13. (a) Briefly explain the Structure of delta and classify according to their sediment input.

Or

- (b) Write a note on different marine environments and their products.

14. (a) Write an essay on turbidites and their significance.

Or

- (b) Write in detail on graphical representation of textural data.

15. (a) “Heavy minerals as provenance indicator”-Discuss.

Or

- (b) “Scanning Electron Microscope”- Explain.

**Part C**

(3 × 10 = 30)

Answer any **three** questions.

16. Give an account on General and Genetic classification of sediments.
  17. Write in detail on different textures and structures of sedimentary rocks with their environmental significance.
  18. What is the role of plate movement in basin formation and how tectonics controls on sandstone composition?
  19. Discuss in detail on Grain size analysis and their geological significance.
  20. Write about the origin and mode of occurrence of heavy minerals. Add a note on heavy mineral analysis.
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**R6700**

**Sub. Code**

**464203**

**M.Sc. DEGREE EXAMINATION, APRIL – 2022**

**Second Semester**

**Applied Geology**

**GEOMORPHOLOGY**

**(CBCS – 2019 onwards)**

Time : 3 Hours

Maximum : 75 Marks

**Part A**

(10 × 2 = 20)

Answer **all** questions.

Write short notes on the following :

1. Spheroidal weathering
2. Frost heaving
3. Graded stream
4. Perennial rivers
5. Fetch
6. Abyssal plain
7. Barchans
8. deflation
9. Cirque
10. Talik

**Part B**

(5 × 5 = 25)

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

11. (a) Explain chemical weathering process with suitable examples.

Or

- (b) Give an outline of various geomorphic process operating on the earth's surface.

12. (a) Explain how the valleys are formed due to different fluvial process.

Or

- (b) Describe different drainage patterns and their significance.

13. (a) How is an oscillatory sea wave differing from a translator sea wave?

Or

- (b) Submerging coasts – Discuss.

14. (a) What is the difference between Zeugens and Yardangs?

Or

- (b) Differentiate desert pavement from ablation.

15. (a) Difference between an ice wedge and a Pingo-Discuss.

Or

- (b) Write a note on types of landforms formed by ground water.



**Part C**

(3 × 10 = 30)

Answer any **three** questions.

16. How a geological structure controls the evolution of landforms? Explain with neat diagram.
  17. Write an essay on “Fluvial cycle”.
  18. Give an account on the geological actions of sea waves with neat diagram.
  19. Elucidate the role of wind as geomorphic agent.
  20. Discuss in detail on major geomorphic features resulting from glacial erosion and deposition.
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**R6701**

**Sub. Code**

**464501**

**M.Sc. DEGREE EXAMINATION, APRIL – 2022**

**Second Semester**

**Applied Geology**

**NATURAL HAZARDS AND MANAGEMENT**

**(CBCS – 2019 onwards)**

Time : 3 Hours

Maximum : 75 Marks

**Part A**

(10 × 2 = 20)

Answer **all** questions.

Write a short note on the following :

1. Hazard
2. GIS
3. Flood
4. Forest fire
5. Groins
6. Revetments
7. Difference between hazards and disasters
8. Mitigation
9. UNDP
10. NIOT

**Part B**

(5 × 5 = 25)

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

11. (a) Describe about GIS in historic Earthquake data analysis.

Or

- (b) Write about Lineament and Geomorphic features.

12. (a) Write a note on flood vulnerability mapping using Remote Sensing.

Or

- (b) Describe inundation mapping.

13. (a) How do you map coastal erosion using Remote Sensing and GIS?

Or

- (b) Briefly explain on “Saline water intrusion”.

14. (a) Explain about the coastal protection structure.

Or

- (b) Discuss about CRZ regulations.

15. (a) Elaborate the following :

- (i) UNESCO
- (ii) UNEP
- (iii) FAO
- (iv) IMCO
- (v) NIO.

Or

- (b) Write an essay on the role of National and International agencies in ocean management.

**Part C**

(3 × 10 = 30)

Answer any **three** questions.

16. Give an account on ideal Remote Sensing system and disaster mapping using GIS.
  17. How to apply Remote Sensing and GIS in flood vulnerability mapping? Add a note on causative factors of flood and its remedial measures.
  18. Saline water intrusion and its impact in Tamil Nadu coast. Discuss with a case study.
  19. Discuss in detail on coastal protection structures with suitable diagrams.
  20. Write in detail on different managerial organizations for ocean management.
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**R6702**

**Sub. Code**

**464503**

**M.Sc. DEGREE EXAMINATION, APRIL – 2022**

**Fourth Semester**

**Applied Geology**

**ENGINEERING GEOLOGY, MINING GEOLOGY, ORE  
PROCESSING AND ENVIRONMENTAL GEOLOGY**

**(CBCS – 2019 onwards)**

Time : 3 Hours

Maximum : 75 Marks

**Part A**

(10 × 2 = 20)

Answer **all** the questions.

1. What is pedology?
2. Write notes on the steps to be taken for slope stability.
3. Highlight the important engineering aspects in the construction of highways.
4. What is reservoir induced seismicity?
5. What are the uses of tunnels?
6. Give a short note on grouting.
7. Write notes on Tube Mills.
8. Mention the ore minerals of Thorium.
9. Give a short note on the alluvial mining.
10. Write notes on ore beneficiation.

**Part B**

(5 × 5 = 25)

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

11. (a) Give an account on the classification of soils and their engineering properties.

Or

- (b) Enumerate the scope and significance of Engineering Geology.

12. (a) Give an account on the groundwater problems faced during the constructions of Dams.

Or

- (b) Write notes on the geological structures and other related conditions of tunnels.

13. (a) Discuss the ground water problem and its management in open cast mining.

Or

- (b) Write notes on the granite mining methods.

14. (a) Describe in detail on the various beneficiation process of coal.

Or

- (b) Describe the genesis, distribution and beneficiation of copper ore deposits.

15. (a) Outline the types of laws and regulations that are enforced in coastal mining.

Or

- (b) Discuss the various methods of mining hazards and controlling measures.

**Part C**

(3 × 10 = 30)

Answer any **three** questions.

16. Explain in detail the engineering properties and various tests undertaken for selecting rocks as the construction material.
  17. Describe the important geological aspects for the construction of reservoirs with a note on the siltation of reservoir.
  18. Explain in detail the mode of transportation of broken ore in open and underground mines. Mention the mine machineries.
  19. Write an essay on the genesis, distribution and beneficiation of lead and zinc deposits.
  20. Give a detailed account on the mining laws and environmental impact on mining projects.
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**R6703**

**Sub. Code**

**464504**

**M.Sc. DEGREE EXAMINATION, APRIL – 2022**

**Fourth Semester**

**Applied Geology**

**PETROLEUM GEOLOGY**

**(CBCS – 2019 onwards)**

Time : 3 Hours

Maximum : 75 Marks

**Part A**

(10 × 2 = 20)

Answer **all** the questions.

1. Give a short note on the structural traps with examples.
2. Describe in short the migration of hydrocarbons.
3. Write a brief note on the Reservoir pressure.
4. Give a short account on the geothermal gradient.
5. Mention the widely used Seismic geophysical methods in oil exploration.
6. Discuss in short the role of viscosity in the accumulation of petroleum.
7. Write notes on carbon cycle.
8. Describe briefly above the thermal maturation of organic matter.
9. Give a short note on the well completion technique.
10. What are the various types of drilling methods employed in hydrocarbon exploration?



**Part B**

(5 × 5 = 25)

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

All questions carry equal marks.

11. (a) Explain in detail on the organic and inorganic hypotheses on the origin of petroleum.

Or

- (b) Discuss in detail on the porosity and permeability of rocks in the genesis and accumulation of hydrocarbons.

12. (a) Describe the source and effects of heat energy in the genesis of hydrocarbons.

Or

- (b) Explain the significance of reservoir pressure and the techniques of its measurement.

13. (a) Describe the significance and usage of gravity method of hydrocarbon exploration.

Or

- (b) Give an elaborate account on the magnetic method of oil exploration.

14. (a) Describe in detail the composition and various types of structures of organic matter.

Or

- (b) Explain the method of accumulation of organic matter in the process of generation of hydrocarbons.

15. (a) Discuss the various well site geological techniques and their merits and demerits.

Or

- (b) Discuss on the types and classification of drilling bits and their utility.

**Part C**

(3 × 10 = 30)

Answer any **three** questions.

16. Outline the categorization of petroliferous basins of India with a case study from Tamil Nadu.
  17. Give a detailed account on the different methods of recovery of hydrocarbons.
  18. Explain in detail the advanced seismic refraction and reflection methods of petroleum exploration and data interpretation.
  19. Describe in detail the geochemical methods of source rock characterization and maturation assessment.
  20. Write an essay on the exploration policy and project management of oil wells.
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