| R8348 | Sub. Code |
|---|---|
| | 464201 |

**M.Sc. DEGREE EXAMINATION, APRIL – 2023**

**Second Semester**

**Applied Geology**

**IGNEOUS AND METAMORPHIC PETROLOGY**

**(CBCS – 2022 onwards)**

Time : Three Hours Maximum : 75 Marks

**Part A** (10 × 1 = 10)

Answer **all** the questions.

1. A fine grained igneous rock in which individual minerals cannot be identified by naked eye shows _____ texture.

   (a) Porphyritic (b) Equigranular

   (c) Aphanatic (d) Glassy

2. The viscosity of silicate melts generally _____ rapidly with increasing temperature.

   (a) Decreases (b) Increases

   (c) Remain constant (d) Does not change

3. Igneous rocks containing >66% SiO2 are classified as _____

   (a) Ultrabasic (b) Basic

   (c) Acidic (d) Intermediate

4. Phonolite is _____ volcanic rock

   (a) Acidic (b) Intermediate

   (c) Basic (d) Ultrabasic

5. Myrmekite structure results due to _____ crystallization between potash feldspar and vermicular quartz.

(a) Eutectic (b) Fractional

(c) Differentiation (d) Progressive

6. Continental tholeiites are generally devoid of _____

(a) Augite (b) Olivine

(c) Iddingsite (d) Plagioclose

7. Island are magmatism is characterized by _____

(a) Tholeiite (b) Oceanitec

(c) Andesite (d) Rhyolite

8. Carbonalite is formed in _____ environment

(a) Orogenic (b) Oceanic

(c) Oceanic rifting (d) Continental

9. Which one of the following rocks is completely unfoliated?

(a) Slate (b) Schist

(c) Phyllite (d) Hornfels

10. The metamorphism involving the combined effect of uniform pressure and heat is described as

(a) Contact metamorphism

(b) Plutonic metamorphism

(c) Dynamothermal metamorphism

(d) Cataclastic metamorphism

## Part B (5 × 5 = 25)

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

11. (a) Write notes on forms and structures of Igneous rock.

Or

(b) Give an account on the CIPW classification of igneous rocks.

12. (a) Enumerate the petrographic provinces of igneous rocks and related diagrams.

Or

(b) Explain the fluid inclusion studies of igneous rocks.

13. (a) Describe the controlling factors of metamorphism.

Or

(b) Give an account on the petrogenesis of Pegmatites.

14. (a) Enumerate the facies and grades concept of metamorphism.

Or

(b) Outline the granitization of migmatites.

15. (a) Give an account on the stress and anti – stress minerals.

Or

(b) Write notes on the mapping of igneous and metamorphic rocks through digital image processing.

## Part C

$(5 \times 8 = 40)$

Answer any **five** questions.

16. Give a detailed account on Ternary Silicate System of crystallization with a neat diagram.

17. Write an essay on the IUGS and Tabular classification of igneous rocks.

18. Describe the various kinds of metamorphism and their products.

19. Explain the petrogenesis of Amphibolites and Charnockites.

20. Write an essay on the mapping of igneous and metamorphic rocks in the field.

21. Give a detailed account on the texture and structures of metamorphic rocks.

22. Explain the application of trace elements, REE in metamorphism.

23. Give an account on the ACF, AKF and AFM variation diagram.

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| R8349 | Sub. Code |
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| | 464202 |

**M.Sc. DEGREE EXAMINATION, APRIL – 2023**

**Second Semester**

**Applied Geology**

**SEDIMENTARY PETROLOGY**

**(CBCS – 2022 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 1 = 10)

Answer **all** questions.

1. Island arcs are found in active plate boundaries of

   (a) Convergent (b) Divergent

   (c) Transform fault (d) None

2. Examples for glassy texture is

   (a) Pegmatite (b) Migmatite

   (c) Obsidian (d) Gabbro

3. The chemical weathering process contains

   (a) Association (b) Dissolution

   (c) Dissociation (d) None

4. Limestone is found in _____ sedimentary rocks

   (a) Acid (b) Basic

   (c) Lithified (d) Ultrabasic

5. Simple hydrocarbon is known as

(a) Gastral oil (b) Mustard oil

(c) Chemical oil (d) Crude oil

6. Rare – earth elements in clastic sediments are a useful to find

(a) Assemblage (b) Provenance

(c) Velocity (d) Mechanism

7. Chemical parameters to use provenance study is called as

(a) Hydrochemistry (b) Biochemistry

(c) Geochemistry (d) Electrochemist

8. Aeolian deposits in sedimentary environments are formed by

(a) Gas (b) Water

(c) Air (d) Wind

9. Morains are characterized by the depositional action of

(a) River (b) Lake

(c) Glacier (d) Geyser

10. Diagenesis and lithifications are observed in

(a) Friction (b) Compaction

(c) Deformation (d) None

## Part B (5 × 5 = 25)

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

11. (a) Write a short note on sedimentary texture classification.

Or

(b) Explain porosity and factors affecting the mechanism.

12. (a) What is clastic sedimentary rocks? Explain with example.

Or

(b) How does nodules and concretions formed?

13. (a) What is karst topography? Give two Indian examples.

Or

(b) Explain lithification and its economic importance.

14. (a) How does sedimentary texture helps to find paleo environment? Explain it.

Or

(b) Explain the formation of petroleum in the deep environment.

15. (a) What is heavy mineral? Explain its economic importance.

Or

(b) Short note on sieve analysis in provenance studies.

## Part C

$(5 \times 8 = 40)$

Answer any **Five** questions.

16. Essay on physical weathering and its various types with example.

17. Write neatly classification of sedimentary rocks with economic values.

18. Explain different types of deltaic environment with important examples.

19. Essay on glaciers with movements and geological significance.

20. Explain various sedimentary structures indicating valuable deposits.

21. Write an essay on scanning electron microscope in sedimentalogical studies.

22. Essay on sedimentary basin evolution in geological time frame.

23. Explain the importance of grain size analysis in geological interpretations.

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| R8350 | Sub. Code |
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| | 464203 |

**M.Sc. DEGREE EXAMINATION, APRIL – 2023**

**Second Semester**

**Applied Geology**

**STRUCTURAL GEOLOGY AND GEOTECTONICS**

**(CBCS – 2022 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 1 = 10)

Answer **all** questions.

1. Primary structures are formed in the rocks during the time of

   (a) Creation (b) Destruction

   (c) Formation (d) Deformation

2. Rocks are made up of the following _____ of minerals.

   (a) Aggregate (b) Non - aggregate

   (c) Fragment (d) Defragment

3. The brittleness property contains _____ of breaking materials.

   (a) 65 – 75% (b) 45 – 55%

   (c) 25 – 35% (d) 15 – 25%

4. The word crystallization means the outcome of

   (a) Liquid form (b) Solid form

   (c) Gaseous form (d) Geoform

5. Cleavage in mineral is the indication of

(a) Binding (b) Strength

(c) Weakness (d) None

6. Salt dome in structural geology indicates the intrusion in _____

(a) Vertical (b) Horizontal

(c) Downward (d) Upward

7. Unconformity is a _____ feature in different age or formation

(a) Depositional (b) Non - depositional

(c) Moving (d) None

8. Joint is a visible _____ structure in the rocks

(a) Fractured (b) Non - fractured

(c) Upward (d) Downward

9. Oceanic crust composed of basalts of

(a) Granite (b) Syenite

(c) Rhyolite (d) Basalts

10. Geological survey employs the study of _____

(a) Interior (b) Exterior

(c) Outcrops (d) Endcrops

## Part B (5 × 5 = 25)

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

11. (a) How do you recognize folds in the filed with sedimentary procedures?

Or

(b) What is primary and secondary sedimentary structures?

12. (a) What is secondary structures? Describe the structural details in the field.

Or

(b) Define structural geology with its importance in geological study.

13. (a) Describe tectonic joints with various formations.

Or

(b) Give various criteria used to recognize faults in the field.

14. (a) What is crystallization? Describe it with features.

Or

(b) Write a short note on physical properties of rock.

15. (a) Describe topography and contour pathways.

Or

(b) What is salt done? Describe its application.

## Part C

$(5 \times 8 = 40)$

Answer any **Five** questions.

16. Essay on mapping of structures in the field environment.

17. What is plate boundaries? Describe with its geological features.

18. How do you recognize igneous intrusions with structural proofs in the field?

19. Essay on unconformities and its structural features in geological record.

20. Write a detailed note on tape and compass survey in structural geology mapping.

21. Describe in details with mechanical properties of rocks and its importance.

22. How do you recognize folds in the field with various geological settings.

23. Essay on geophysical evidence available in continental drift theory.

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**R8351**

**Sub. Code**
**464204**

**M.Sc. DEGREE EXAMINATION, APRIL – 2023**

**Second Semester**

**Applied Geology**

**ECONOMIC AND MINING GEOLOGY**

**(CBCS – 2022 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 1 = 10)

Answer **all** questions.

All questions carry equal marks

1. Which country has the highest worth of mineral resources?

   (a) India (b) China

   (c) Russia (d) Ukraine

2. The policy which encourages the private in exploration in mining was formulated in

   (a) 1957 (b) 1983

   (c) 1993 (d) 1999

3. The single mineral which exist in abundance in

   (a) Sandstone (b) Limestone

   (c) Granite (d) Charnockite

4. Supergene enrichment includes

   (a) sulphates (b) chlorides

   (c) sulfides (d) oxides

5. Platinum is not found in

(a) Baula Nausahi (b) Hanumalpura

(c) Sittampundi (d) Champaran

6. One of the following is the microscopic constituent of coal

(a) vitraine (b) vitrinite

(c) clarain (d) fusain

7. One of the following methods is used for mineral exploration

(a) boulder exploration

(b) magnetic

(c) gravimetric

(d) electrical

8. The equipment used is not for underground hydraulic mining

(a) derockers (b) graders

(c) wheel dozers (d) draglines

9. Mining lease is generally for a maximum period of

(a) 10 (b) 20

(c) 99 (d) 5

10. The third digit in UNFC code represents

(a) economic viability (b) feasibility

(c) geologic axis (d) availability

## Part B (5 × 5 = 25)

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

11. (a) Explain why varieties of minerals are formed in India?

Or

(b) What are the minerals used in the manufacturing of paints and pigments?

12. (a) What do you mean by magmatic differentiation? Explain.

Or

(b) Write a short note on Bateman's classification of mineral deposits.

13. (a) Discuss the World and Indian occurrences of radioactive minerals.

Or

(b) Explain the coalification process.

14. (a) List out and explain the ore prospecting methods.

Or

(b) Describe the screening process in mining of ores.

15. (a) Write short notes on the mining laws in India.

Or

(b) Explain the environmental impact assessment for a hypothetical mining project

## Part C

$(5 \times 8 = 40)$

Answer any **five** questions.

16. Write an essay on the World's mineral policy.

17. Describe the various types of minerals with examples and its occurrence.

18. Describe the hydrothermal process of ore formation.

19. Write a detailed account on the classification of mineral deposits.

20. Describe the techniques used to analyse the contents and composition of coal.

21. Elaborate and essay on the sampling techniques in ore prospecting.

22. Discuss the various sub-surface mining methods.

23. Explain the laws and regulation for mining in coastal area at global level.

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| R8352 | Sub. Code |
|---|---|
| | 464502 |

**M.Sc. DEGREE EXAMINATION, APRIL – 2023**

**Second Semester**

**Applied Geology**

**ENGINEERING GEOLOGY AND ENVIRONMENTAL GEOLOGY**

**(CBCS – 2022 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 1 = 10)

Answer **all** questions.

1. Size, shape, and degree of packing of the component gives _____

   (a) Porosity

   (b) Permeability

   (c) Elasticity

   (d) All above

2. Studies of rock, soil, water and their interaction is called as _____

   (a) Physical geology

   (b) Chemical geology

   (c) Engineering geology

   (d) None

3. Example of coarse grained igneous rocks is _____

(a) Gabbro
(b) Granite
(c) Diorite
(d) All

4. Soils are formed by weathering of _____

(a) Sand (b) Clay
(c) Silt (d) Rocks

5. Mechanical weathering agents are the following _____

(a) Wind (b) River
(c) Glaciers (d) All

6. highway roads are developed with _____ materials

(a) Single layered (b) Double layered
(c) Three layered (d) None

7. Pile foundation is made up of _____

(a) Concrete shield (b) Clay materials
(c) Loose materials (d) None

8. Tunnel site selection is primarily composed of

(a) Basic rock
(b) Volcanic rock
(c) Anticline structure
(d) Syncline structure

9. The actual remedies for mining reclamation is by

(a) EIA study (b) BIA study

(c) CIA study (d) All factors

10. Acid rain can be noticed with specific areas

(a) Residential (b) Natural

(c) Agricultural (d) Induatrial

**Part B** (5 × 5 = 25)

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

11. (a) Explain the porosity and permeability of rocks in engineering view.

Or

(b) Write short note on types of rock density with suitable example.

12. (a) What is tunnel? Explain two geological process involved in tunnel construction.

Or

(b) Short notes on types and classification of roads.

13. (a) What is foundation? Explain the pile foundation.

Or

(b) Explain mechanism behind the formulation of reservoirs.

14. (a) Briefly explain coal mining procedures.

Or

(b) Write the fundamental components of acid rain and their impacts.

15. (a) Describe basic principle of ecosystem and their functions.

Or

(b) What is ozone layer depletion? Explain with geologic time frame.

**Part C** $(5 \times 8 = 40)$

Answer any **five** of the following questions with neat diagrams.

16. Discuss index properties of soil in engineering geology.

17. Explain various industrial minerals and their applications in construction field.

18. Essay on geological investigation for dam site selection.

19. Neatly sketch out various health hazards on mining activities.

20. Procedure for grain size determination in geological applications.

21. Essay on various engineering properties of soils in construction industry.

22. Discuss environmental impact assessment in mining site selection.

23. Describe climate change issues and sequential geological study.

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