R7286	Sub. Code
	464301

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2022

Third Semester

Applied Geology

ECONOMIC GEOLOGY

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Differentiate between metasomatism and metamorphism.

2. Write short notes on Placer deposits.

3. Give a short note on fluid inclusion.

4. Write the Indian occurrence of Uranium and Thorium.

5. Give a short account on the minerals used in paint and pigment industry.

6. Write notes on critical and essential minerals.

7. Write notes on coal macerals.

8. Give a short account on the reserve estimation of mine through UNFC.

9. Write the technique of preparation of polished surface of ores.

10. Briefly give the optical properties of ore minerals.

Part B (5 × 5 = 25)

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

11. (a) Enumerate the mode of formation of minerals through magmatic differentiation and magmatic concentration.

Or

(b) Describe the hydrothermal process of mineral formation of mineral deposits.

12. (a) Give an account on the metallogenic Epochs and provinces.

Or

(b) Outline the distribution and mode of occurrence of Copper ore minerals deposits in India.

13. (a) Explain the mode of occurrence, and origin of minerals used in refractory industry.

Or

(b) Give an account on the mode of occurrence, and distribution of minerals used in cement industry.

14. (a) Outline the origin and coalification processes.

Or

(b) Give the grade, rank and classification of coal.

15. (a) Enumerate the applications of ore microscopy.

Or

(b) Draw a neat sketch of ore microscope and label the parts.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Elaborate on the oxidation and supregene enrichment mode of formation of minerals with neat sketches.

17. Write an essay on the Lindgren's and Bateman's classification of mineral deposits.

18. Describe the mineralogy, distribution and mode of occurrence of Lead and Zinc deposits in India.

19. Explain in detail the origin, classification, and distribution of Coal deposits in India.

20. Describe the National mineral policy and its role in National economy.

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R7287	Sub. Code
	464302

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2022

Third Semester

Applied Geology

HYDROGEOLOGY

(CBCS – 2019 onwards)

Time : Three Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Write notes on Bernoulli equation.

2. Distinguish between specific yield and specific retention.

3. Give a short note on percolation ponds.

4. What is the difference between a drainage basin and watershed?

5. Write notes on cone of depression.

6. Give a short note on Aquifer Storativity.

7. What do you mean by ground water quality?

8. Discuss in short the role of porosity and permeability in the movement of ground water.

9. Write notes on springs.

10. Distinguish between trace elements and major and minor elements.

Part B (5 × 5 = 25)

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

11. (a) Outline the components of the Hydrologic cycle.

Or

(b) Write notes on the Darcy's law and its applications.

12. (a) Describe sea water intrusion and its preventive measures.

Or

(b) Give an account on rain water harvesting.

13. (a) Discuss the geological problems faced during the construction of wells in soft and hard rock areas.

Or

(b) Outline the different ground water provinces of India.

14. (a) Discuss the causes for water level fluctuations. Write notes on methodology and necessity for pumping tests.

Or

(b) Enumerate the watershed characteristics and utility of well logging techniques.

15. (a) Explain the role of village level groups in the conservation and use of ground water.

Or

(b) Discuss different types of agriculture and pesticide pollution of ground water.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Write an essay on the vertical distribution of ground water with a neat sketch.

17. Describe in detail the classification of aquifers and their types.

18. Enumerate the various electrical resistivity methods of ground water exploration.

19. Write an essay on various ground water artificial recharge methods and their significance.

20. Describe the quality of ground water with reference to its trace element concentration and its treatment.

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R7288	Sub. Code
	464502

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2022.

Third Semester

Applied Geology

GEOCHEMISTRY

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Draw Diagram wherever necessary.

Part A (10 × 2 = 20)

Answer **all** questions.

1. Write about Entropy.
2. Explain Equilibrium constant.
3. Write notes on Phase Rule.
4. What is isomorphism?
5. Discuss about Raoult's Law.
6. Write about Debye – Huckel equations.
7. Discuss about isotopic Fractionation.
8. What are path finder elements?
9. Discuss about the Eh-ph diagrams.
10. What are trace elements? Discuss on its abundance in water.

Part B (5 × 5 = 25)

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

11. (a) Discuss about the kinds of Thermodynamic systems and process.

Or

(b) Write about Atmosphere its components and discuss its significance an altering earths geochemistry.

12. (a) Discuss about Samarium – neodymium system.

Or

(b) Write about Ur-Th-Pb system.

13. (a) Discuss about the pressure temperature variations during rock melting.

Or

(b) Discuss about the Geochemical cycling of Carbon.

14. (a) What is delta notation. What causes departure of $\delta^{18}O$ and δD from meteroic water line in Ground water system.

Or

(b) Discuss about the diagenesis of Organic materials.

15. (a) Explain about Eh-Ph diagrams.

Or

(b) Discuss about Gibbs energy of redox reactions.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain about Geochemical sampling and types.

17. Write about the techniques used in design and Implementation of geochemical exploration Survey.

18. Write about the principles and application of Mass spectrometry.

19. Discuss about the Geochemistry of seawater and its alterations.

20. Discuss about the Geochemical classification of elements.

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