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Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE  
Second Semester Integrated M.Sc Geology Degree Examination, April 2025  
CHE21C02 - Physical Chemistry  
(2022 Admission onwards)

Time: 2 hours

Max. Marks : 60

**Section A (Short answers)**

**(Answer questions up to 20 marks. Each question carries 2 marks)**

1. State Boyle's law
2. Explain the effect of temperature on the surface tension of a liquid.
3. The standard molar enthalpy of vaporisation water is  $40.6 \text{ kJ mol}^{-1}$  at  $100^\circ\text{C}$ . Calculate entropy of vaporisation at  $100^\circ\text{C}$ .
4. The cell constant of a cell is  $0.5 \text{ cm}^{-1}$ . The resistance of an electrolyte solution taken in the cell is 50 ohms. Calculate the conductivity of the solution
5. What is the effect of dilution on specific conductance ?
6. State the law of rationality of indices.
7. Write Nernst equation for Cu electrode.
8. What is osmotic pressure ?
9. Calculate the average velocity of  $\text{O}_2$  molecules at 273 K.
10. Write any four advantages of conductometric titrations.
11. Discuss different types of crystal systems .
12. What is meant by anisotropic property? Give one example,

[Ceiling of marks: 20]

**Section B (Paragraph)**

**(Answer questions up to 30 marks. Each question carries 5 marks)**

13. Define Kohlrausch's law. Discuss the different applications of it.
14. Write a note on Maxwell's equation for the distribution of molecular velocities.
15. Explain the construction and working of fuel cell.

16. Explain the  $\Delta H$  and  $\Delta S$  conditions that would become to determine whether a process would be spontaneous or not.
17. State and explain Henry's law. Mention any two applications of the law.
18. Derive Bragg's equation and mention its applications.
19. What are the laws of Osmotic pressure? Derive an expression for osmotic pressure.

[Ceiling of marks: 30]

**Section C (Essay)**

**(Answer any one. Each question carries 10 marks)**

20. (a) Write down the cell reaction and calculate the emf of the following cell  
 $\text{Zn}/\text{Zn}^{+2}_{(0.001\text{M})}/\text{Cu}^{+2}_{(0.1\text{M})}/\text{Cu}$  Given  $E_{\text{zn}} = -0.76 \text{ V}$  &  $E_{\text{cu}} = 0.34 \text{ V}$   
b) Derive Ostwald's dilution law and mention its limitations.
21. Discuss the stoichiometric defects found in crystal

**(1 x 10 = 10 Marks)**

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester Integrated M.Sc Geology Degree Examination, April 2025

**GL02IB02 – GEOMORPHOLOGY**

(2023 Admission onwards)

Time: 2 hours

Max. Marks: 60

*(Draw neat sketches, wherever necessary)*

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**PART – A**

Answer *all* questions.

Each question carries **Two** mark.

**Ceiling -20 Marks**

1. What do you mean by slow flowage?
2. Define perched water table?
3. Define alluvial fan?
4. Distinguish between stalactite and stalagmite?
5. What are the uses of Brunton Compass?
6. Differentiate solifluction and mudflow?
7. What are yardangs, and how do they form through the erosional action of wind?
8. How does sediments transportation occur in rivers?
9. Write about the formation of oxbow lake?
10. Differentiate barchan and longitudinal dunes?
11. How do waves differ from currents?
12. What do you meant by abyssal plain?

**PART – B**

Answer *all* questions.

Each question carries **Five** marks.

**Ceiling -30 Marks**

13. How do physical factors like expansion, crystal growth, thermal expansion, organic activity, and colloidal plucking influence weathering processes?
14. Write note on types of lakes.
15. Define mass wasting. Explain different types of Mass wasting.
16. What are the factors influencing occurrence of groundwater?
17. Give a note on types of coral reefs?
18. What is Brunton compass? Give a note on components of Brunton compass?
19. Elaborate the ocean floor topography?

**PART - C**

Answer *anyone* question.

Each question carries **Ten** marks.

20. Discuss the erosional and depositional landform created by ocean?
21. Explain the geological work of wind in respect of erosion, transportation and deposition?

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Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

**Eighth Semester Integrated M.Sc Geology Degree Examination, April 2025**

**GLO8IB16 - ADVANCED STRUCTURAL GEOLOGY**

(2020 Admission onwards)

Time: 2 ½ hours

Max. Marks: 80

*(Draw neat sketches, wherever necessary)*

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**PART – A**

**Answer any *ten* questions**

**Each question carries Two marks**

1. What are the components of deformation?
2. Write about the products of shear zones.
3. How Pumpelly's rule is useful in structural geology?
4. What are extension fractures?
5. Discuss the causes of faulting.
6. What is the principle of structural analysis in geology?
7. Show heave and hade in a fault system.
8. Discuss the factors controlling the development and propagation of fractures in rock formation.
9. Describe the behavior of rocks under stress.
10. Write about the strain acting in two dimensions.
11. Differentiate Wulff net and Schmidt net in stereographic projection.
12. What are fabric elements in tectonites?

**10 x 2 = 20 Marks**

**PART – B**

**Answer any *five* questions.**

**Each question carries Eight marks.**

13. Discuss about the classification of strain ellipse with the help of a diagram.
14. Write a short note on strain distribution in fold and stages of buckle fold.
15. Explain briefly the concept of shear zone and Ramsay classification of shear zone.
16. Describe the four types of fold interference and the outcrop pattern shown by them.
17. Discuss the development and propagation of fractures.
18. Analyze the tectonic significance of joints.
19. Explain how unconformities can be used to correlate tectonostratigraphic sequences.

**5 x 8 = 40 Marks**

**PART - C**

**Answer any *two* questions.**

**Each question carries Ten marks.**

20. Write in detail about the geometric classification of fold after Ramsay and strain distribution in fold.
21. Provide a detailed comparison of L-, L-S, and S-tectonic fabrics with examples.
22. Define stereographic projection. Explain the basics principles and techniques used in creating stereographic projection.
23. Discuss in detail about the indicators that develop while shearing happens in rocks.

**2 x 10 = 20 Marks**

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2M8A25002

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Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

**Eighth Semester Integrated M.Sc Geology Degree Examination, April 2025**

**GLO8IB17 – EXPLORATION GEOPHYSICS AND FIELD TECHNIQUES**

(2020 Admission onwards)

Time: 2 ½ hours

Max. Marks: 80

*(Draw neat sketches, wherever necessary)*

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**PART – A**

**Answer any ten questions**

**Each question carries Two marks**

1. Define Zeta potential?
2. What are telluric currents?
3. What is Geoid?
4. Write about gravity anomalies?
5. What is Bouguer correction?
6. Differentiate diamagnetism and paramagnetism?
7. Define isothermal remnant magnetism?
8. Define Bulk Modulus?
9. What are the uses of SP curves?
10. Define Neutron - Neutron log?
11. Define Hysteresis loop?
12. What are the common causes of magnetic anomalies?

**10 x 2 = 20 Marks**

**PART – B**

**Answer any five questions.**

**Each question carries Eight marks.**

13. Briefly explain Induced polarization and its types?
14. Write a note on IGRF.
15. Explain Earth's magnetic field?
16. Define Fermat's principle and explain the law of reflection.
17. Write a short note on resistivity log and its types?
18. Briefly describe the law of Radioactivity.
19. Explain SP surveying, its types, and applications in geophysical exploration.

**5 x 8 = 40 Marks**

**PART - C**

**Answer any two questions.**

**Each question carries Ten marks.**

20. Explain electromagnetic induction, detailing its principles and applications.
21. Explain resistivity surveying, detailing its principles, methods, equipment used, and applications in geophysical exploration.
22. Discuss the instruments used in magnetism, detailing their principles of operation, types, applications, and significance in geophysical exploration.
23. Explain geophysical well logging methods, highlighting their principles, types, and applications in subsurface exploration.

**2 x 10 = 20 Marks**

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2M8A25003

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

**Eighth Semester Integrated M.Sc Geology Degree Examination, April 2025**

**GLO8IB18 – ADVANCED ECONOMIC GEOLOGY**

(2020 Admission onwards)

Time: 2 ½ hours

Max. Marks: 80

*(Draw neat sketches, wherever necessary)*

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**PART – A**

**Answer any *ten* questions**

**Each question carries Two marks**

1. What is gas hydrates?
2. Where do kimberlites occur?
3. What is meant by “continental freeboard”?
4. Define strategic minerals with examples?
5. Define metallogeny?
6. Give names of any four Uranium minerals?
7. What is Alpine type deposit?
8. Write about Sedimentary Fe deposits?
9. Write any four examples of mineral deposits formed in supergene sulphide enrichment zone?
10. What are the two types of gold rich metamorphic deposits?
11. What are the different forms of sandstone-uranium-type deposits?
12. What are carbonatite deposits?

**10 x 2 = 20 Marks**

**PART – B**

**Answer any *five* questions.**

**Each question carries Eight marks.**

13. What is VMS Deposits? Classify VMS deposits based on bulk composition?
14. Define geothermometry? What are the different methods of geothermometry?
15. Describe textures and structures of ore and gangue minerals?
16. Briefly explain Mississippi valley type deposits?
17. Describe morphology of ore bearing deposits?
18. Write about the economic significance of ore bearing layers of chromite and PGM in Bushveld complex?
19. What are the deposits formed at orogenic and anorogenic environments at different geological time?

**5 x 8 = 40 Marks**

**PART - C**

**Answer any *two* questions.**

**Each question carries Ten marks.**

20. Describe physical and optical properties of any ten important ore minerals?
21. Give detail account of strata bound and stratiform ore deposits with examples?
22. Explain the ore deposits formed at near surface environment?
23. Describe the geology and genesis of important U, Pb-Zn, Cu, Al and Fe ore deposits of India?

**2 x 10 = 20 Marks**

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