G9

1B2A24020 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester Integrated M.Sc Geology Degree Examination, April 2024

CHE2IC02 - 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. What are the causes of deviation of real gases from ideal behaviour ?
2. What is the effect of increasing temperature on the solubility of a gas in a liquid ?
3. In a certain process, 750 J of heat is absorbed by a system while 400 J of work is done on the system. Calculate the internal energy change in the process.
4. The resistance of 0.01M solution of weak acid is $5x10^3$ ohms, when taken in a conductivity cell of cell constant $0.5cm^{-1}$. Calculate the molar conductance of the solution
5. At what temperature will the RMS velocity of O_2 gas be equal to that of H_2 molecule at 27^0C?
6. What is meant by space lattice ?
7. Define the term standard potential.
8. What is reverse osmosis ?
9. Define most probable velocity of a gas.
10. What is meant by buffer action?
11. Define Gibbs free energy. What is its physical significance ?
12. Differentiate between extrinsic and intrinsic imperfections in crystals.

[Ceiling of marks: 20]

Section B (Paragraph)
(Answer questions up to 30 marks. Each question carries 5 marks)

13. How do the molar conductivities of strong and weak electrolytes vary with dilution ? Explain.
14. Write a note on Maxwell's equation for the distribution of molecular velocities.
15. Explain the construction and working of calomel Electrode.
16. ΔH and ΔS for the reaction $2NO_{(g)}+O_{2(g)} \longrightarrow 2NO_{2(g)}$ at 500 K are -223.6KJ and -187.8 JK^{-1}. Calculate ΔG and predict whether reaction is spontaneous or not at 500K.
17. State and explain Henry's law. Mention any two applications of the law.
18. Derive Bragg's equation and mention its application.
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)At 25^0C, the conductivity of 0.1M KCl is 0.01291 ohm^{-1}. Its resistance in a conductivity cell at the same temperature is found to be 192.4 ohm. A solution of another electrolyte BA with concentration 0.01M offers a resistance of 250 ohms in the same cell. Calculate the molar conductance of BA

    (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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1M2A24126 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester Integrated M.Sc Geology Degree Examination, April 2024

GL02IB02 – GEOMORPHOLOGY

(2023 Admission onwards)

Time: 2 hours Max. Marks: 60

(Draw neat sketches, wherever necessary)

PART – A

Answer ***all*** questions.

Each question carries **Two** mark.

Ceiling -20 Marks

1. What are the fundamental differences between endogenic and exogenic forces in Geomorphology?
2. What is hanging valley?
3. Discuss the term 'denudation'
4. Expand the term 'frost wedging'?
5. Differentiate loess and seif?
6. What is a knickpoint?
7. What is synoptic viewpoint in aerial photography?
8. How do springs form?
9. Differentiate the bars and beach barrier?
10. Write about the chemical composition of sea water?
11. What are topographic maps?
12. What do you meant by cone of depression?

PART – B

Answer *all* questions.

Each question carries **Five** marks.

Ceiling -30 Marks

13. Briefly explain the soil profile?
14. Explain the types of mass wasting?
15. Write about the different types of drainage patterns?
16. How do different types of dunes form, and what factors influence their development?
17. Give a brief outline of erosional features of groundwater?
18. Write a short note on GPS explain its segments?
19. Elaborate the chemical processes involved in weathering.

PART - C

Answer any ***one*** question.

Each question carries **Ten** marks.

20. Discuss the erosional landforms developed by river?
21. Explain depositional and erosional landforms created by glaciers.

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1B2A24097 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester Integrated M.Sc Geology Degree Examination, April 2024

PHY2IC02 – Optics, Laser & Electronics

(2022 Admission onwards)

Time: 2 hours Max. Marks : 60

Section A

Short Answer Type

(Answer all questions in two or three sentences, each correct answer carries a maximum of 2 marks, Overall Ceiling 20)

1. Can we observe interference fringes with thick film? Why?
2. Distinguish between optical path and geometrical path.
3. Differentiate between interference and diffraction of light.
4. What is the difference between circularly polarized light and elliptically polarized light?
5. Explain any one application of optical activity of plane polarized light.
6. The transverse wave nature of light is exhibited by polarization. Explain
7. Distinguish between polarizer and analyzer.
8. How a Zener diode differ from ordinary diode?
9. Why current amplification factor is less than one in Common Base configuration?
10. What is a tank circuit?
11. Write Boolean expression and truth table for an Exclusive OR gate.
12. What is optical pumping?

(Ceiling-20)

Section B
Paragraph/ Problem Type

(Answer all questions in a paragraph of about half a page to one page, each correct answer carries a maximum of 5 marks)

13. Explain how coherent sources are produced in Fresnel's two mirror.
14. Explain the formation of Newton's rings.
15. Explain resolving power and dispersive power of a plane transmission grating.
16. Calculate the thickness of a plate which would convert plane polarized into circularly polarized light. Given $\lambda = 5890A^0$, $\mu_o = 1.658$, $\mu_e = 1.486$.
17. A 50 V Zener diode is used to obtain a regulated output voltage across a load 10 kΩ. The series resistor is 5 kΩ. If the input changes from 80 to 120 V, find the maximum Zener current.
18. In Fraunhoffer diffraction pattern due to a narrow slit a screen is placed 2m away from the lens to obtain the pattern. If slit width is 0.2mm and the first minima lie 5mm on either sides of the central maximum , find the wavelength of light.
19. Explain the working of a He-Ne laser.

(Ceiling- 30)

Section C- Essay Type

(Answer any one question. Answer carries 10 marks)

20. What is a grating ?. Derive grating equation. Also explain formation of secondary maxima and minima.
21. Explain amplifying action of a transistor? Draw and explain input and output characteristics of a transistor amplifier in common emitter configuration.

(1x10= 10 Marks)