



QP CODE: 24020694



24020694

Reg No :

Name :

B.Sc DEGREE (CBCS) REGULAR EXAMINATIONS, APRIL 2024

Fourth Semester

Complementary Course - CH4CMT05 - CHEMISTRY - PHYSICAL CHEMISTRY - II

(Common for B.Sc Geology and Water Management Model III, B.Sc Geology Model I & B.Sc Physics Model I)

2017 Admission Onwards

309ADDF8

Time: 3 Hours

Max. Marks : 60

Part A

*Answer any **ten** questions.*

*Each question carries **1** mark.*

1. Give mathematical expression for Boltzman distribution of energy.
2. What is meant by the finger print region in the IR spectrum?
3. What is chemical vapour deposition?
4. What do you mean by quantum dots & nanocrystals?
5. Distinguish between average rate of reaction and instantaneous rate of reaction.
6. What is the unit of k for (i) a zero order reaction and (ii) a first order reaction ?
7. What are catalysts?
8. Give any two reasons for the extremely low quantum yields of some photochemical reactions.
9. The resistance of a 0.01 M solution of an electrolyte was found to be 212 ohms at room temperature when taken in a cell containing electrodes of area 2.25 cm^2 placed 2 cm apart. Calculate the molar conductivity of the solution at the same temperature.
10. What is quinhydrone electrode?
11. Give Gibbs Helmholtz equation.
12. Give the oxidation half cell reaction of hydrogen oxygen fuel cell.

(10×1=10)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*





13. Explain the terms chromophores and auxochromes.
14. Write a note on the importance of nanomaterials.
15. If the half-life of a first order reaction $A \rightarrow B$ is 2 min, how long will it take for [A] to reach 10% of the initial concentration?
16. Derive Beer-Lambert law.
17. Draw Jablonski diagram and explain different transitions.
18. What is Kohlrausch law? How is the ionisation constant of a weak monobasic acid is determined by the application of this law?
19. How is the conductivity of an electrolyte solution determined?
20. Sketch the general shapes of the conductometric titration curves for the following:
(i) Strong acid vs strong base; (ii) Weak acid vs weak base.
21. Sketch the calomel electrode and give the electrode reaction.

(6×5=30)

Part C

Answer any **two** questions.

Each question carries **10** marks.

22. Using the rigid rotator approximation describe the calculation of equilibrium internuclear distance.
23. Discuss in detail microemulsion method for nanoparticle synthesis.
24. Explain Arrhenius equation. Discuss Arrhenius concept of activation energy. Give graphical representation of activation energy diagram.
25. Explain the principle of conductometric titrations with a suitable example. What are the advantages of the method?

(2×10=20)

