



QP CODE: 25019388



25019388

Reg No :

Name :

**B.Sc DEGREE (CBCS)) REGULAR/ IMPROVEMENT/ REAPPEARANCE / MERCY
CHANCE EXAMINATIONS, FEBRUARY 2025**

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

FA2BA1C8

Time: 3 Hours

Max. Marks : 60

Part A

*Answer any **ten** questions.*

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

1. How many normal modes of vibrations are possible for CO₂ molecule?
2. What is meant by rigid rotator?
3. "Nanotechnology is new, but research on nanometer scale is not new at all." Justify this statement.
4. Define top down and bottom up approach.
5. Define molecularity of a reaction.
6. What is meant by rate determining step of a reactor ?
7. Given an expression for finding $t_{1/2}$ of a first order reaction.
8. Give any two reasons for the extremely low quantum yields of some photochemical reactions.
9. A solution of Ni(NO₃)₂ is electrolysed between platinum electrodes using a current of 5 amperes for 30 minutes. What mass of nickel will be produced at the cathode?
10. Draw the titration curve for the conductometric titration of a weak acid against a strong base and explain.
11. What are concentration cells? Give examples.
12. Define temperature coefficient of emf of a cell.

(10×1=10)





Part B

Answer any **six** questions.

Each question carries **5** marks.

13. What is meant by quantisation of energy?
14. Define carbon nanotube? What are the types of carbon nanotubes?
15. Compare exothermic and endothermic reactions on the basis of activated complex theory.
16. Write a short note on enzyme catalysis.
17. Write a short note on fluorescence.
18. What is meant by molar conductivity of an electrolyte solution? How does it vary with dilution for (i) a strong electrolyte and (ii) for a weak electrolyte? Explain.
19. How does electrode potential originate? Define single electrode potential.
20. What do you mean by Reference electrodes? What are the two types of reference electrodes? Explain calomel electrode in detail.
21. Discuss the principle involved in the potentiometric titration of an acid against a base. How is the end point detected in such a titration?

(6×5=30)

Part C

Answer any **two** questions.

Each question carries **10** marks.

22. Discuss different electronic transitions in molecule.
23. Discuss chemical vapour deposition method in detail.
24. Explain Arrhenius equation. Discuss Arrhenius concept of activation energy. Give graphical representation of activation energy diagram.
25. State Kohlrausch's law of independent migration of ions. How is it useful in determining the molar conductivity at infinite dilution of a weak electrolyte?

(2×10=20)

