B.Sc DEGREE (CBCS) EXAMINATIONS, OCTOBER 2021

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)

2019 Admission only

AA20C41D

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 the essentialcondition for amolecule to absorb microwave radiation?

3. Define nano science.

4. What is chemical vapour deposition?

5. What is the unit of k for (i) a zero order reaction and (ii) a first order reaction ?

6. Give two examples of photochemical reactions.

7. Give any two reasons for the extremely low quantum yields of some photochemical reactions.

8. Explain the applications of photosensitization in photography.

9. Define electrochemical equivalent of a substance. How is it related to the equivalent weight?

10. Give the IUPAC convention for representing a galvanic cell.

11. Give the conventional expression for the determination of emf of a cell.

12. Define fuel cell. Give an example.

(10×1=10)

Part B

*Answer any **six** questions.*

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

13. What is meant by finger print region in IR spectrum? Give its importance in structure elucidation.

14. Explain the mechano-chemical method for the synthesis of nanomaterials.

15. Discuss the factors that affect the rate of a reaction.

16. Give Arrhenius equation and explain its significance.

17. Distinguish between homogeneous catalysis and heterogeneous catalysis.

18. Describe how conductivity measurements may be used to determine the solubility of a sparingly soluble salt in water.

19. Explain the conductrometric titration of mixture of a strong acid and strong base vs strong base.

20. What are concentration cells'? Give examples. Explain the origin of e.m.f in a concentration cell with reference to any one example.

21. Outline an experiment for the accurate measurement of the emf of a cell.

(6×5=30)

Part C

Answer any two questions.

Each question carries 10 marks.

22. Discuss about (a) fundamental concepts of electronic spectroscopy and (b) various applications of UV-Vis spectroscopy.

23. Define carbon nanotube? What are the types of carbon nanotubes? Highlight the properties of carbon nanotubes?

24. Explain collision theory of reaction rates.

25. State and explain Kohlausch's law. How is it useful in the determination of limiting molar conductivity of acetic acid?

(2×10=20)