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T – 2570

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, July 2024

First Degree Programme under CBCSS

Chemistry

Complementary Course for Zoology

CH 1431.4 : PHYSICAL CHEMISTRY

(2020 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer **all** questions, **each** question carries **1** mark.

1. What is Tyndall effect?
2. Give one example for emulsion system.
3. Explain Hardy-Schulz rule?
4. What are auxochromes? Explain with example.
5. Give one example for the liquid systems showing both UCST and LCST.
6. What is the unit for first order reaction?
7. Define the term molality?
8. Give one example for basic buffer.
9. What is Lewis acid-base concept?
10. Give an example for pseudo order reaction.

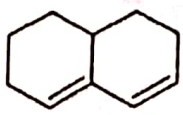
(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Answer **any eight** questions, **each** question carries **2** marks.

11. Explain critical micelle concentration.
12. What causes coagulation in colloidal solutions?
13. Why TMS is used as standard in NMR spectroscopy?
14. Describe the principle of TGA.
15. What is meant by bathochromic shifts?
16. Write two applications of UV spectroscopy.
17. Explain any one electrical property of colloid.
18. Write the equation for second order reaction and explain the terms.
19. What are the different scale Δ and δ in NMR spectroscopy?
20. Define zero order reaction with example.
21. Explain Raoult's law
22. Calculate λ max max of the compound.



(8 × 2 = 16 Marks)

SECTION – C

Answer **any six** questions, **each** question carries **4** marks.

23. Describe various applications of colloids.
24. In a first order reaction, it takes the reactant 48.5 minutes to be 25% decomposed. Calculate the rate of the reaction.
25. Write the principle and application of Zone electrophoresis.
26. Explain Arrhenius and Lowry Bronsted definition of acid and bases.
27. Discuss electrical double layer and the importance of zeta potential.

28. What is the effect of conjugation on the chromophore in UV absorption?

29. Describe the principle and application of HPLC technique.

30. Explain the H NMR spectrum of ethanol using a diagram.

31. Discuss the boiling point-composition curve of phenol-water system.

(6 × 4 = 24 Marks)

SECTION – D

Answer **any two** questions, **each** question carries **15** marks.

32. Discuss the principle, instrumentation and applications of AAS.

33. (a) Explain the collision theory of reaction rate.

    (b) Discuss the various theory of catalytic reactions.

34. (a) Write notes on :

        (i) Chemical shift

        (ii) Spin-spin interaction

    (b) Explain Arrhenius equation and parameters. Define second order reaction with an example and the rate equation.

35. (a) What is ionic product of water? Calculate the P_H and P_{OH} of a 0.03 M solution of HCl at 25°C.

    (b) Describe the effect of temperature on reaction rate.

(2 × 15 = 30 Marks)
