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R – 2371

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, July 2023

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. Write one example for purification methods of colloids.
2. Name the compound used as reference in NMRcspectroscopy.
3. What is meant by critical micelle concentration?
4. Give two examples for neutral Lewis base.
5. What is meant by the term ideal solution?
6. Define Hardy-Schulze rule.
7. What is meant by a chromophore, give one example?
8. What is meant by atomization in AAS?

P.T.O.

9. State Raoult's law.

10. Write one example for zero order reaction.

(10 × 1 = 10 Marks)

SECTION – B

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

11. What is a pseudo ordered reactions? Give one example.

12. Explain the Lowry-Bronsted concept of acid and base with one example each.

13. Define buffer solution and give one example for acid buffer.

14. What is the effect of temperature on reaction rate?

15. What is Cottrell Precipitator?

16. What are the applications of UV-Visible Spectroscopy?

17. Calculate the degree of hydrolysis of 0.5 M solution of sodium acetate at 25°C.

    Ka = 1.8 × 10 –5 and K w = 1×10^{-14}

18. Describe the principle of flame emission spectroscopy.

19. Write two applications of HPLC.

20. Explain molecularity and order of a reaction.

21. What are azeotropic mixtures?

22. What you meant by a Sol?

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six** questions. Each question carries **4** marks.

23. Derive equation for first order kinetics with an example.

24. A buffer solution contains 0.30 mole of NH_4OH and 0.45 mole of NH_4Cl per litre. Calculate the pH of the solution if 0.5ml of 1 M HCl added to it. Dissociation constant of NH_4OH is 1.81 at room temperature.

25. Explain how zeta potential effect the stability of colloidal particles.

26. What do you mean by hydrolysis constant? Explain with suitable example.

27. What is Arrhenius and Lewis concept of acids and bases.

28. Explain the basic principle and instrumentation of AAS.

29. Explain steam distillation process.

30. Describe various methods for purification of colloids.

31. Illustrate on different properties of colloids.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. Each question carries **15** marks.

32. Write an essay on NMR and UV-V is spectroscopy.

33. What are colloids? Discuss its types and applications.

34. (a) What is energy of activation? What happens to the energy of activation in presence of a catalyst, explain with suitable example.

    (b) Principle and instrumentation of (i) Themogravimetry (ii) Differential thermal analysis

35. Derive the relation between Kh, Kw and Ka

(2 × 15 = 30 Marks)