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Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme Under CBCSS

Chemistry

Complementary Course for Zoology

CH 1431.4 – PHYSICAL CHEMISTRY

(2017 – 2018 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. Answer in one word to maximum of two sentences. **Each** question carries **1** mark.

1. Write Arrhenius equation and explain the terms.
2. Write one example for order kinetics?
3. What are Bronsted acids? Give one example.
4. Explain Tyndall effect.
5. What is an emulsion? Give one example.
6. What is meant by MRI? Write one application.
7. What are auxochromes?
8. Give one example for the liquid systems showing both UCST and LCST.

P.T.O.

9. What is the basic principle of flame emission spectroscopy?

10. Explain the process capillary electrophoresis.

(10 × 1 = 10 Marks)

SECTION – B

Short answer type. Answer **any eight** questions from the following. **Each** question carries **2** marks.

11. What are buffer solutions? Give one example for an acidic buffer.

12. What is meant by ionic product of water?

13. What are heterogeneous catalysts? Give one example.

14. Prove that the time for half change of a first order reaction is independent of its initial concentration.

15. What are micelles? How it is formed?

16. What causes coagulation in colloidal solutions?

17. Why is ^{12}C not NMR active?

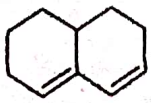
18. Describe the principle of TGA.

19. What is meant by bathochromic shifts?

20. Mention the important applications of HPLC.

21. State and explain Raoult's law.

22. Calculate λ_{max} of the compound



(8 × 2 = 16 Marks)

SECTION – C

Short essay type. Answer **any six** questions from the following.. **Each** question carries **4** marks.

23. Differentiate order and molecularity of a reaction.

24. What will be the pH and degree of hydrolysis respectively for the salt BA of 0.1 M concentration? Given $K_a(HA) = 10^{-6}$ and $K_b(BOH) = 10^{-6}$.

25. Discuss the different methods of purification of colloids?

26. Outline the ^1H NMR spectrum of ethanol and chloroacetic acid.

27. Discuss the principle and applications of differential thermal analysis (DTA).

28. What is the effect of conjugation on the chromophore absorption? Explain with an example.

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

30. Explain how steam distillation is useful for the purification of aniline?

31. Write short note on various applications of colloids.

(6 × 4 = 24 Marks)

SECTION – D

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

32. Write short notes on the following

(a) Electrical properties of colloids. , **10**

(b) Kinetic properties of colloids **5**

33. Discuss the principle, instrumentation and applications of AAS. 15

34. (a) Explain the collision theory of reaction rate. 8

(b) Discuss the intermediate compound theory of catalysis. 7

35. Describe the principle and process of fractional distillation of completely miscible liquid systems.

(2 × 15 = 30 Marks)
