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Reg. No. : .....

Name : .....

First Semester B.Sc. Degree Examination, January 2024

Career Related First Degree Programme Under CBCSS

Group 2(a) — Botany and Biotechnology

Complementary Course :

BB 1131 : PHYSICAL ASPECTS OF BIOCHEMISTRY

(2020 Admission Onwards)

Time : 3 Hours Max. Marks : 80

PART – A

Answer **all** questions. Short answer type. Each question carries **1** mark.

1. Define osmosis.
2. What are biological buffers?
3. What is pOH?
4. Definition of mole fraction.
5. What are the types of crystalloids?
6. What is an emulsion?
7. What is the range of pH?
8. What is spectroscopy?
9. Mention the components of affinity chromatography.
10. What is octet rule?

(10 × 1 = 10 Mark

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PART – B

Answer **any eight** questions, not exceeding one paragraph. Each question carries **2** marks.

11. Define hypertonic and hypotonic solutions.

12. Find out the pH of the solution in which the concentration of hydronium ion is 8.0×10^{-8} M.

13. Write the formula to calculate normality.

14. Give three examples of colloids.

15. What is the difference between ionic and covalent bonds?

16. What is density gradient centrifugation?

17. Define TLC.

18. What are the common functional groups in biomolecules?

19. Mention the differences between PAGE and SDS-PAGE.

20. Define Van der Waals force.

21. What are the types of electrophoresis?

22. Define structural isomerism.

(8 × 2 = 16 Marks)

PART – C

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

23. Calculate the pH of a solution containing 3.0 M hydrofluoric acid and 2.5 M fluoride by using Henderson-Hasselbach equation (K_a for hydrofluoric acid = 6.76×10^{-4}).

24. Discuss about acid dissociation constant (K_a)

25. Distinguish between true and colloidal solution.

26. Describe the principle and instrumentation of pH meter.

27. Mention the differences in between colorimeter and spectrophotometer.

28. Discuss about peptide bonds.

29. Describe the importance of surface tension and viscosity.

30. Explain about Donnan membrane equilibrium.

31. Write a note on hydrogen bonding.

(6 × 4 = 24 Marks)

PART – D

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

32. Define osmotic pressure and explain how osmotic pressure is calculated.

33. Discuss electrophoresis: overview, principle, types and uses.

34. Explain in detail about ultracentrifugation.

35. Explain about all non-covalent types of bonds.

(2 × 15 = 30 Marks)
