

Reg. No. :

Name :

Sixth Semester B.Sc. Degree Examination, April 2023

First Degree Programme Under CBCSS

Chemistry

Core Course – XII

CH 1643 : PHYSICAL CHEMISTRY III

(2013-2016 Admission)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer all questions. Each carry 1 mark.

1. Give an example for zero order reaction?
2. What is ionic product of water?
3. What is meant by photosensitization?
4. What are non-ideal mixtures?
5. What is single electrode potential?
6. Define Beer-Lambert's law.
7. What is the pH of 0.001 M HCl solution?
8. What is meant by Buffer action?
9. Write the relation between K_p and K_c .
10. What is transference number?

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Answer any **eight** questions. Each carry **2** marks.

11. Explain over voltage?
12. Write down the Nernst equation for copper electrode in CuSO_4 solution.
13. Explain the very high quantum yield of certain photochemical reactions.
14. What are the deviations from Raoult's law.
15. Explain why the addition of non-volatile solute increases the boiling point of a liquid?
16. Explain Debye-Falkenhagen effect.
17. What are azeotropic mixtures? Give two examples.
18. Discuss intermediate compound formation theory?
19. Explain the hydrolysis of salt of strong acid-weak base with equation?
20. What is condensed phase rule equation?
21. Explain efflorescence?
22. What are the applications of Henderson equation?

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six** questions. Each carry **4** marks.

23. A solution of HCl was electrolysed using Pt electrode. The cathode compartment contains 0.1820g of HCl before electrolysis and 0.1676g. After electrolysis. The weight of Ag deposited in the coulometer in series with the apparatus was 0.2525g. Calculate the transport number of H^+ and Cl^- ions?
24. Write down the Debye-Huckel-Onsager equation and explain the terms. What is its use?

25. Derive the equation for the EMF of a concentration cell with transference.
26. Explain congruent melting point with the help of phase diagram?
27. Explain CST? Give example for system with upper, lower and upper cum lower CST?
28. What are the applications of conductometric titrations?
29. Explain distribution law and its application.
30. Explain Pb-Ag system with a neat diagram.
31. Explain enzyme catalysis taking suitable example.

(6 × 4 = 24 Marks)

SECTION – D

Answer any two questions. Each carry 15 marks.

32. (a) Explain Hydrogen-Oxygen fuel cell? 5
 (b) What are different types of reference electrodes, explain with example? 10
33. (a) Explain any one method for the determination of transport number? 10
 (b) Explain activity and activity coefficient of an electrolyte? 5
34. (a) Explain Lindeman theory of uni molecular reaction
 (b) Apply phase rule to water system
35. Derive Clausius-Clapeyron equation and discuss its applications.

(2 × 15 = 30 Marks)