



Reg. No. :

Name :

Sixth Semester B.Sc. Degree Examination, April 2019

First Degree Programme under CBCSS

CHEMISTRY

Core Course – XII

CH 1643 – Physical Chemistry – III

(2013 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

(Answer **all** questions. Answer in **one** word to maximum **one** sentence. **Each** question carries **one** mark.)

1. Define activation energy.
2. What is half life period ?
3. Define the term number of components in phase rule.
4. What is electrode potential ?
5. What is the relation between K_p and K_c ?
6. Explain the principle of steam distillation.
7. What is calomel electrode ?
8. Calculate the pH of a 0.001 M HCl solution.
9. What are azeotropic mixtures ?
10. What is the unit of rate constant of first order reactions ? (10×1=10 Marks)

SECTION – B

(Short answer type. Answer **any 8** questions from the following. **Each** question carries **two** marks.)

11. What is Arrhenius equation ? Explain the terms.
12. Explain the difference between order and molecularity.



13. Explain levelling effect.
14. When CH_3COONa is hydrolysed, what would be the nature of resulting solution, acidic or basic ? Explain.
15. Distinguish between the terms 'triple point and eutectic point' in phase diagram.
16. What is pseudo first order reaction ? Explain with an example.
17. What is a Standard Hydrogen Electrode ?
18. Explain the term incongruent melting point.
19. Explain fractional distillation.
20. Define standard electrode potential.
21. What is Debye-Huckel-Onsager equation ?
22. Explain why in some photochemical reactions high quantum yield is obtained. (8×2=16 Marks)

SECTION – C

(Short essay type. Answer **any 6** questions from the following. **Each** question carries **four** marks.)

23. The experimental data for the reaction $2\text{A} + \text{B}_2 \rightarrow 2\text{AB}$ is as follows :

Exp. No.	(A) mol L ⁻¹	(B) mol L ⁻¹	Rate constant mol L ⁻¹ s ⁻¹
1	0.50	0.50	1.6×10^{-4}
2	0.50	1.0	6.4×10^{-4}
3	1.0	1.0	3.2×10^{-4}

Write the most probable rate equation for the reaction and justify the answer.

24. Explain how a catalyst increases the rate of the reaction.
25. Why is it necessary to add NH_4Cl prior to adding NH_4OH for precipitating third group cations as their hydroxides in qualitative analysis ?
26. Explain the phase diagram of water system.
27. Explain the process of desilverisation of Lead.



28. Explain the Michaelis – Menten law with equation.

29. Explain Kohlrausch's law and it's applications.

30. What is fuel cells ? Explain it's working.

31. Write a note on potentiometric titrations.

(6×4=24 Marks)

SECTION – D

(Answer **any 2** questions from the following. **Each** question carries **15** marks.)

32. Explain the theory of absolute reaction rate.

33. a) Explain temperature of dependence of equilibrium constant.

b) Explain the applications of solubility product in inorganic qualitative analysis.

34. a) Explain KI-H₂O system.

b) Briefly explain the intermediate compound formation theory of catalysis.

35. a) Explain the determination of Transference number by moving bound method.

b) Compare qualitatively H₂-Cl₂ photochemical reaction and H₂-Br₂ reaction.

(2×15 = 30 Marks)

St. Xavier's College, Thumba