



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

**B.Sc. DEGREE EXAMINATION – CHEMISTRY**

**FIFTH SEMESTER – NOVEMBER 2011**

**CH 5507 - PHASE EQUILIBRIA AND KINETICS**

Date : 04-11-2011  
Time : 9:00 - 12:00

Dept. No.

Max. : 100 Marks

**PART – A**

**Answer ALL the questions**

**(10 x 2 = 20 marks)**

1. Define congruent melting point.
2. Calculate the degrees of freedom of an aqueous solution of Sodium Chloride.
3. State Raoult's law and write its mathematical expression.
4. What are azeotropic mixtures?
5. Write two limitations of collision theory.
6. What are the characteristics of zero order reaction?
7. Write the Arrhenius equation and define the terms involved in it.
8. Differentiate between order and molecularity of a reaction.
9. What is acid – base catalysis?
10. What is Wilkinson's catalyst? Write one application of it.

**PART – B**

**Answer any EIGHT questions**

**(8 x 5 = 40 marks)**

11. Explain the CST of nicotine – water system.
12. a) What is pseudo first order reaction? Give one example.  
b) Find the boiling point of a solution containing 0.36g of glucose ( $C_6H_{12}O_6$ ) dissolved in 100g of water ( $K_b=0.52$  k/mol).
13. Discuss the principle behind steam distillation.
14. Derive an expression for rate constant of second order reaction involving one reactant.
15. Explain the chain reaction of HBr formation from Hydrogen and Bromine.
16. Explain Lindemann's theory of unimolecular reaction.
17. Discuss any 3 factors that affect chemical reaction.
18. What are the characteristic features of enzyme catalysis
19. Obtain Van't Hoff equation for osmotic pressure of dilute solutions.
20. Derive Clausius – Clapeyron equation and explain its use.
21. Describe ARRT in detail.
22. Explain the Langmuir's unimolecular adsorption isotherm.

**PART – C**

**Answer any FOUR questions**

**(4 x 10 = 40 marks)**

23. Discuss the salient features of the phase diagram of  
(a) Lead – silver system      (b) Ferric chloride - water system.
24. Write notes on any TWO  
(a) Solvent Extraction  
(b) Fractional distillation  
(c) Nernst distributive law.

25. Draw and explain the positive and negative deviations of the pressure – composition curves for non ideal solutions.
26. Describe any three methods to determine order of reaction.
27. Explain opposing, consecutive and parallel reactions in detail with suitable examples.
28. Derive Michaelis – Menton equation and discuss the kinetics of enzyme catalysis.

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