

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

B.Sc. DEGREE EXAMINATION – CHEMISTRY

FIFTH SEMESTER – NOVEMBER 2007

**CH 5500 - PHYSICAL CHEMISTRY - II**

**AD 12**

Date : 24/10/2007  
Time : 9:00 - 12:00

Dept. No.

Max. : 100 Marks

**PART – A**

**Answer ALL questions.**

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

1. What are metal-metal ion electrodes? Give an example.
2. What are Fuel cells?
3. Define equivalent conductance. Give its unit.
4. Calculate the ionic strength of 0.01M KCl .
5. What is a pseudo-unimolecular reaction? Give an example.
6. Give two examples for thermal chain reactions.
7. How does chemisorption differ from physisorption?
8. What are the factors affecting enzyme catalysis?
9. State Einstein's photochemical law.
10. Define the term chemiluminescence.

**PART – B**

**Answer any EIGHT questions.**

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

11. Explain an experimental method of determining the standard reduction potential of zinc electrode.
12. Derive the Nernst equation for describing the effect of concentration of electrolyte on electrode potential.
13. How will you determine  $K_{sp}$  of AgCl.
14. Explain Arrhenius theory of electrolyte dissociation. Give the evidences.
15. Write briefly notes on hydrogen over-voltage.
16. Write briefly on the kinetics of parallel reaction with an example.
17. In a first order reaction, it takes the reactants 40.5 minutes to be 25% decomposed. Calculate the rate constant of the reaction.
18. Describe the Lindemann's theory of unimolecular reactions.
19. Explain the unimolecular reactions on solid surfaces.
20. Write briefly on Wilkinson's Catalysts.
21. Explain the Langmuir's adsorption isotherm.
22. Write on the basic concept of photosensitized reactions.

**PART – C**

**Answer any FOUR questions.**

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

23. a) Explain any three applications of electromotive series.  
b) What are amalgam electrodes? Give an example.
24. a) What is Weston Cadmium Cell? Write the electrode equation in the cell.  
b) Explain how the glass electrode can be used to determine the pH of a solution.
25. a) Explain the Debye theory of activity coefficient.  
b) The dissociation constant of a weak monobasic acid in aqueous solution is  $8.0 \times 10^{-5}$ . What is the degree of dissociation of a 0.05M solution of the acid.
26. Integrate the rate expression for a first-order reaction. Explain the half-life time of a reaction. Give suitable examples.
27. a) Explain briefly on thermal chain reaction of  $H_2$  and  $Br_2$ .  
b) Describe Flash photolysis for the study of kinetics.
28. Derive Michaelis – Menton equation for a single substrate enzymatic reaction and explain the reaction.

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