LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIFTH SEMESTER – APRIL 2010

CH 5500 - PHYSICAL CHEMISTRY - II

Date & Time: 03/05/2010 / 1:00 - 4:00 Dept. No. Max. : 100 Marks

PART-A (20 Marks)

Answer **ALL** questions (**10 x 2 = 20**)

1. Write the cathodic reaction of the quinhydrone electrode.

2. What is the reduction potential of Pt/H_2 electrode at 25˚C and at pH: 0.

3. What do you mean by secondary reference electrode? Give an example.

4. What are concentration cells? Give one example.

5. Explain why a salt like KCl is used in the salt bridge?

6. Differentiate order from molecularity.

7. What is a consecutive reaction? Give an example.

8. Explain how solvent polarity affects the rate of a reaction between two cations.

9. Bring out the differences between adsorption and absorption.

10. Why quantum yield for the reaction between H_2 and Cl_2 is very high?

PART-B (40 Marks)

Answer **any eight** questions (**8 x 5 = 40**)

11. How will you determine the standard reduction potential of an electrode?

12. Derive the equation connecting emf and concentration for a cell.

13. Determine the emf of the cell at 25˚C that could be formed out of the electrodes Ag / Ag^+ (0.01M) (SRP = 0.78V) and Cu / Cu^{2+} (0.1M) (SRP = 0.34 V)

14. Explain ,with a diagram, the working of Weston saturated cadmium cell

15. The standard quinhydrone electrode (SRP=0.6996V) is combined with hydrogen electrode. Calculate the emf of the cell at 25˚C if the pH of the solution at the hydrogen electrode is two.

16. Explain any five types of electrodes with one example for each.

17. A first-order reaction under goes 75% completion in 50 minutes. Calculate its rate constant.

18. Derive the integrated rate equation for a first –order reaction.

19. Explain any two methods of determining the order of a reaction.

20. Obtain the rate equation for an enzyme catalyzed reaction.

21. Derive Langumuir adsorption isotherm.

22. Explain the principle of photosensitization with an example.

PART-C (40 Marks)

Answer **any four** questions (**4 x 10 = 40**)

23. Explain the following:

(a) Potentiomeric precipitation titration

(b) Determination of pH using Calomel electrode.

24. (a) Define transport number.

(b) Explain the determination of transport number by moving boundary method.

25. (a) Define equivalent conductance.

(b) Explain the variation of equivalent conductance with concentration for a weak electrolyte.

26. (a) Explain the kinetics of an S_N1 reaction.

(b) Discuss collision theory of reaction rate.

27. (a) Explain any five factors that affect the rate of a chemical reaction.

(b) Discuss the ARRT theory of reaction rate.

28. (a)Explain secondary photochemical process with an example.

(b) Write a note on photoluminance.

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