LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – CHEMISTRY

FIFTH SEMESTER – November 2009

CH 5500 - PHYSICAL CHEMISTRY - II

Date & Time: 31/10/2009 / 9:00 - 12:00 Dept. No. | | Max. : 100 Marks

PART – A

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

01. What is SHE? Give its application.
02. Define chemical cell. Give an example.
03. What is meant by Hydrogen over voltage?
04. Define transport number.
05. Calculate the ionic strength of 0.1M aq NaCl.
06. What is pseudo-unimolecular reaction? Give an example.
07. What is meant by enzyme catalytic reaction?
08. What is adsorption? Give an example.
09. Define quantum yield of a photochemical reaction.
10. What is chemiluminesence?

PART – B

Answer any EIGHT questions. **(8 x 5 = 40 marks)**

11. Explain the experimental method of determining the standard reduction potential of Zn electrode.
12. Explain the working of Weston cell.
13. Calculate the EMF of the following electrochemical cell at 25^oC.

    Cu, Cu^{2+} (a = 0.1 M) || H^+ (a = 0.01M), H_2(0.95 atm); Pt $E^o_{oxd}cu^{2+}$| cu 0.34 volt
14. Discuss briefly the principle of polarography.
15. Explain Arrhenius theory of electrolyte dissociation. Give evidences in favour of it.
16. How is order of a reaction determined experimentally using half life method?
17. Explain the effect of temperature on reaction rates.
18. Calculate the activation energy of a reaction whose rate constant is tripled by a 12^oC rise in temperature in the vicinity of 27^oC.
19. Derive the Langmuir adsorption isotherm.
20. What are the factors affecting enzyme catalysis.
21. Differentiate physisorption from chemisorption.
22. Explain the basic concepts of photosensitized reactions.

PART – C

Answer ANY FOUR questions. **(4 x 10 = 40 marks)**

23. a) Derive the Nernst electro chemical equation.

    b) Derive the emf of a concentration cell without transference.

24. a) Explain the determination of pH using glass electrode.

    b) How will you determine K_{sp} of AgI.

25. Explain the Debye Huckel Theory of strong electrolytes.

26. Explain the collision theory of bimolecular reactions. What are its limitations.

27. Derive Michaelis – Menton equation for a single substrate enzymatic reaction and explain.

28. a) Discuss the kinetics of the photochemical reaction of H_2 and Cl_2.

    b) Explain the term fluorescence.

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