# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – PLAN.BIO&BIOTECH.,ADV.ZOO.&BIOTECH.

THIRD SEMESTER – NOVEMBER 2009

**CH 3104 / 3102 - CHEMISTRY FOR BIOLOGIST - I**

Date & Time: 11/11/2009 / 9:00 - 12:00 Dept. No. Max. : 100 Marks

## PART – A

***Answer ALL the questions*** **(10 X 2 = 20)**

1. Mention the factors that influence the formation of ionic bond.
2. Define bidentate ligand with an example.
3. Account for the solubility of ethanol in water.
4. Calculate the molarity of a solution of oxalic acid containing 30g in 500 ml water.
5. What is the pH of a 0.001M solution of NaOH?
6. Differentiate between order and molecularity
7. Give the rate law for the reaction A → B
8. What is flocculation value?
9. Arrange the following acids in the increasing order of –I effect in them: $FCH_2$-COOH ; $ClCH_2COOH$ ; $CH_3CH_2COOH$
10. Which of the following compounds shows geometrical isomerism – Give reasons

    a) $CH_3CH=CBr_2$ b) $CH_3CBr = CBrCH_3$

## PART – B

***Answer any EIGHT only*** **(8 X 5 = 40)**

11. Discuss the structures of KCl and CsCl.
12. Explain the hybridization and structure of $CH_4$ and $BeCl_2$ molecule
13. Mention the structure and function of haemoglobin.
14. Explain types of hydrogen bonding involved in i) acetic acid ii) salicylaldehdye.
15. Explain the importance of common ion effect with an example.
16. What are primary and secondary standards? Mention their requirements.
17. Obtain an expression for first order rate constant of a reaction.
18. Explain homogeneous and heterogeneous catalysis with suitable examples.
19. Differentiate Lyophobic sols from Lyophilic sols.
20. Explain the following i) electrophoresis ii) electroosmosis

21. What are enantiomers? Describe the properties of enantiomers.
22. Mention the conditions to exhibit geometrical isomerism and identify the geometrical isomers of 2-butene.

## PART – C

***Answer any FOUR only*** **(4 X 10 = 40)**

23. a) Discuss the structure of NaCl (4)

    b) Explain Werner's theory through precipitation and conductivity measurements (6).

24. a) Discuss the structure and hybridization involved in $BF_3$ and $IF_7$ molecules (5)

    b) Explain the different types of hydrogen bonding with examples. (5).

25. a) Explain buffer solution and buffer capacity with suitable examples (6).

    b) A buffer solution contains 0.20 mole of $NH_4OH$ and 0.5 mole of $NH_4Cl$ per liter. Calculate the pH of the solution. Dissociation constant of $NH_4OH$ is $1.81 \times 10^{-5}$ at 25°C. (4)

26. Derive the second order rate equation for two reactants of equimolar concentration

27. a) Mention the criteria for optical activity and explain how it is shown by tartaric acid (5)

    b) Mention the significance of peptization and cogulation of colloids (5)

28. What are addition and condensation polymerizations. Bring out their differences with examples.

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