LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **PBB/ADV.ZOO & BIO TECH.**

THIRD SEMESTER – NOVEMBER 2007

AD 4

CH 3104/3102 - CHEMISTRY FOR BIOLOGIST - I

Date : 02/11/2007 Dept. No. Max. : 100 Marks
Time : 9:00 - 12:00

PART-A

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

1. Write the IUPAC names of the following complexes.
   (a) $[Co(NH_3)_2(en)_2]Cl_3$ (b) $Ca_2[Fe(CN)_6]$
2. Draw the structure of CsCl unit cell. Mention the Cesium and Chloride ions in it.
3. Define molality of a solution.
4. State the law of volumetric analysis.
5. Differentiate homogeneous and heterogeneous catalysis with an example each.
6. What are peptizing agents?
7. Define molecularity of a reaction.
8. What is meant by Brownian movement?
9. Why bakelite is a thermosetting plastic where as polythene is a thermoplastic. .
10. Arrange the following acids in their increasing order of acidity. Justify your answer.
    Dichloro acetic acid, Acetic acid, Trichloro acetic acid, Chloro acetic acid.

PART-B

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

11. Explain the factors affecting the formation of ionic bond.
12. (a) What are the properties of covalent compounds. (3)
    (b) Mention the type of hydrogen bonding existing in the following molecules and draw their structures.
    [1] Water [2] Salicylaldehyde (2)
13 Discuss Werner's theory of coordination complexes.
14 (a) Derive the expression for ionic product of water and give its value at 298K (3)
    (b) What are secondary standard solutions? Give an example. (2)
15. (a) Define mole fraction. (2)
    (b) Calculate the normality of a solution containing 40g of NaOH dissolved in 5 litres of the solution. (3)
16. Mention the various types of specificity shown by enzyme catalysed reactions giving one example each.
17. What is meant by order of a reaction? Give an example each for zero and first order reactions.
18. Differentiate lyophilic and lyophobic colloids with suitable examples.

19. Write a note on electrophoresis.

20. (a) Define mesomeric effect. Mention its types with examples. (3)

(b) Why trimethyl amine is less basic than dimethyl amine? (2)

21 Explain the two types of polymerization reactions with examples.

22. (a) Discuss the isomerism exhibited by maleic and fumaric acids with their structures. (3)

(b) What are enantiomers? (2)

PART-C

Answer any **FOUR** questions. ($4 \times 10 = 40$)

23. (a) Discuss the structure of methane, ammonia and water molecule based on VSEPR theory (8)

(b) What is meant by dipole – dipole interactions? (2)

24. (a) Explain the structure and function of chlorophyll. (6)

(b) Write a note on optical isomerism exhibited by octahedral complexes. (4)

25. (a) Explain the buffer action of mixture of acetic acid and sodium acetate. (6)

(b) Calculate the pH of a buffer mixture containing 0.1M NH_4OH and 0.4M NH_4Cl.

(K_b of NH_4OH is 1.8×10^{-5}) (4)

26. (a) Derive the rate constant for a second order reaction involving two different reactants.

(b) The half life period of a first order reaction is 1600 s. Calculate the rate constant of the reaction

27. (a) Explain the optical isomerism exhibited by tartaric acid. (6)

(b) Suggest any two methods to separate enantiomers from racemic mixture. (4)

28. (a) How will you prepare the following polymers?

[1] Nylon-6,6 [2] PVC [3] Thiokol

(b) Mention the prerequisites for a primary standard solution. (4)

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