Second PUC Question Paper-MARCH 2007
CHEMISTRY

PART-A

Note: i) answer all the questions **10x1=10**

ii) Questions have to be answered in one word or in one sentence each. Each question carries one mark.

1. Name the process used in desilverisation of lead.
2. During electrolysis of brine H-ions get discharged in preference to sodium ions. Give the reason.
3. Give an example of a complex where a ligand satisfies both the primary and secondary valencies of the metal ion.
4. Define Threshold energy.
5. What is the pH of 10^{-2} M NaOH.
6. What happens to the vapor pressure of a liquid when a non-volatile solute dissolved in it?
7. Name the final product formed when a primary amine is subjected to alkylation.?
8. Write the general equation of Wurtz reaction.
9. Give the structural formula of pyrogallol.
10. What is meant by denaturation of a protein?

PART-B

Note: Answer any ten questions.

ii) Each question carries two marks **10x2=20**

11. 11. With the help of Ellingham diagram explain why Aluminium is used as a reducing agent in the
12. manufacture of chromium from chromic oxide.
13. 12. How does conc. Sulphuric acid react with oxalic acid crystals? Give equation.
14. 13. Calculate EAN of iron in potassium ferrocyanide.
15. 14. Sketch the shape of sigma bonding and antibonding molecular orbitals when s-atomic orbitals overlap.
16. 15. Show that the rate of a first order reaction doubles when the concentration of the reactant is doubled.
17. 16. Explain why NH_3 molecule can be considered both as a Lewis base and a Bronsted base?
18. 17. Calculate the number of particles present in the unit cell of BCC.
19. 18. Give any two differences between an ideal solution and a non-ideal solution.
20. 19. How do you convert chloroethane to ethanoic acid? Give equations.
21. 20. What is Sache-Mohr theory of stainless rings?
22. 21. How is a primary amine prepared by Hoffmann's bromamide reaction?
23. 22. Write the Haworth's structure of α-maltose.

PART-C

I. Answer any two of the following **2x5=10**

23. a) Draw a neat labeled diagram of blast furnace used in the extraction of cast iron. Give the chemical reactions that take pace in the different zones of the furnace.
    b) Write the structure of tetracarbonyl nickel (0) complex. Indicate the type of hybridization undergone by the central metal ion.
24. a) How a potassium dichromate manufactured from chromite ore?
    b) How does electron gas theory explain the bright metallic luster of metals?
25. a) Write the electronic configuration of oxygen molecule. Explain why oxygen molecule is paramagnetic.
    b) Explain ionization isomerism with an example.

II. Answer any three of the following questions **3x5=15**

26. a)Differentiate between inductive effect and mesomeric effect.
b) Explain geometrical isomerism with one example.
27. a) Explain the mechanism of nitration of benzene.

b) Give the structural formulae of i)Lysine ii) Proline

28. a) How does phenol react with i) Bromine water ii) Dil. Nitric acid?
    b) Explain S_N1 mechanism with example.
29. a)Write the strucuteal formula of tritearin. What happens when tristearin is heated with
    i) dil. sulphuric acid and steam ii) KOH solution.
    b) What is a reducing suger? Give one example.

III. Answer any three of the following 3x5=15

30. a) Write Arrhenius equation and explain the terms involved in it. The specific reaction rate of a reaction increases by a factor 4 if the temperature is changed from 27^0C fto 47^0C. Find the activation of the reaction.
    b) How is Brownian movement is caused?
31. a) Derive Henderson's equation for the pH of an acid buffer.
    b) What is dialysis?
32. a) 40 mg of NaOH is dissolved in 10 litre of solution . What is the pH of the solution?
    b) Define conjugate acid-base pair.
    c) What are the factors affect the single electrode potentials?
33. a) The vapour pressure of pure benzene at a certain temperature is 200 mm/Hg. At the same temeprature, the vapour pressure of a solution containing 2gm of a non-volatile, non-electrolytic solid in 78gm of benzene is 195 mm/Hg. What is the molecular mass of the solute?
    b) Give two differences between lyophilic and lyophobic sols.
34. a) Give any three assumptions of Arrhenius theory of electrolytic dissociation.
    b) The standard free energy change for a reaction is 62 kJ/mol. Calculate the equilibrium constant at 300K.
    [R= 8.314 JK^{-1} mol^{-1}]

PART-D

D1

IV. Answer any one of the following 1 x10=10

35.a) Write the electronic configuration of 3rd series of elements. Hence explain
    i) Why Cu^+ ion and Sc^{2+} ion are colorless?
    ii) Zn^{2+} ions are diamagnetic.
    b) Explain the mechanism of Cannizzaro's reaction.
    c) i) Define Entropy? What happens to the entropy when a gas undergoes expansion?
    ii) What is meant by co-ordination number? What is the co-ordination number of the ion if radius ration of the crystal r+/r- is 0.53?
36. a) How is a mixture of noble gases separated by Dewar's Char coal adsorption method?
    b) How does a monocarboxylic acid reacts with i) alcohols ii) ammonia
    Give equations and name of the organic products formed in these reactions.
    c) The SRP values of Aluminium and Magnesium electrodes are -1.66 V and 12.37 V respectively. Represent the galvanic cell constructed using these electrodes. Calculate the free energy change for the cell reaction.
    [faraday (F)= 96.500 coulomb]

V. Answer any two of the following 2 x 5 = 10

37. a) How is p-bromo acetanilide prepared from acetanilide in the laboratory?
    b) Give a general test for a carbohydrate.
38. Describe an experiment to show that acid hydrolysis of methyl acetate is a first order reaction.
39. for the estimation of potassium permanganate using standard ferrous ammonium sulphate solutioni) Write chemical equation for the reaction involved.
    ii) Give the equivalent mass of potassium permanganate.
    iii) Name the indicator used
    iv).What is the color change at the end point?