DELHI PUBLIC SCHOOL, JAMMU

Half Yearly Assignment, Session (2018-19)

Class: 12th **Time allowed: 3hrs**
Subject: Chemistry **M.Marks: 70**

General Instructions: (i) All questions are compulsory. (ii) Questions 1 to 5 carry one mark each.
(iii) Questions 6 to 12 carry two marks each. (iv) Questions 13 to 24 carry three marks each.
(v) Questions 24 to 26 carry five marks each. (vi) Use of calculators is not allowed.
(vii) log2 = 0.3010, log 3 = 0.4770, log 5 = 0.6990

Q.1 Give the IUPAC name for $[Pt(NH_3)_6]Cl_4$

Q.2 What are n-type semiconductors?

Q.3 What is meant by the term 'F-centre'?

Q.4 What are macromolecular colloids?

Q.5 Define the term activation energy.

Q.6 Give the role of NaCN in the extraction of silver.

Q.7 What mass of Ag could be plated on a spoon from electrolysis of $AgNO_3$ solution by 1A current for 10 minutes?

Q.8 The resistance of 0.01 N solution at 25°C is 200 ohm. cell constant of the conductivity cell is unity. Calculate the equivalent conductance of the solution.

Q.9 What are emulsions? Give its various types.

Q.10 What is observed when a beam of light is passed through a colloidal solution of As_2S_3?

Q.11 The vapour pressure of a pure liquid A is 40 mm Hg at 310 K. The vapour pressure of this liquid in solution with B is 32 mm of Hg .Calculate the mole fraction of A in the solution if mixture obeys Raoult's law.

Q.12 A cubic solid is made up of two elements P and Q. Atoms 'Q' are present at the corners of cube & atoms 'P' at body centre. What is the formula of compound and co-ordination number for P and Q?

Q.13 A metallic element exists as body -centred cubic lattice .Each edge of the unit cell is 288 pm. The density of the metal is 7.2 gcm^{-3} . How many atoms and unit cells are there in 100g of the metal?

Q.14 The rate constant of reaction at 500 K and 700 K are 0.02 sec^{-1} and 0.07 sec^{-1} respectively. Calculate the value of activation energy and pre-exponential factor.

Q.15 Give the mechanism for corrosion.

Q.16 Give three methods of preparation and properties for alcohols.

Q.17 (a) Give the chemical equations for the following reactions:
(i) Preparation of phenols from cummene (ii) Reaction of phenols with pthalic anhydride.
(iii) Williamson's synthesis.

Q.18 Give the preparation and properties for haloarenes.

Q.19 Nitration of aniline gives o-, m- and p- isomer products collectively. Why?

Q.20 $FeSO_4$ solution mixed with $(NH_4)_2SO_4$ solution in 1 : 1 molar ratio gives test for Fe^{2+} but $CuSO_4$ solution mixed with aqueous NH_3 in 1 : 4 molar ratio does not gives test for Cu^{2+}. Why?

Q.21 Give reason why $[Cr(NH_3)_6]^{3+}$ is paramagnetic while $[Ni(CN)_4]^{2-}$ is diamagnetic.

Q.22 (a) Write the product formed on reaction of HI with methoxy benzene.
(b) Using benzene, conc. H_2SO_4 and NaOH, give the preparation of phenols.

Q.23 The specific conductivity of a saturated solution of AgCl at 18°C is 1.24×10^{-6} S cm^{-1} after subtracting that of water. Ionic conductances at infinite dilution of Ag^+ and Cl^- ions at this temperature are 53.8 and 65.3 espectively. Calculate the solubility of AgCl in gram per litre.

Q.24 For the reaction, $2A + BA_2B$, rate = k.[A].$[B]^2$ with k = 2×10^{-6} mol^{-2} Lt^2 sec^{-1}. Calculate the initial rate of reaction, when [A] = 0.1 M and [B] = 0.2 M. Also, calculate the rate, when the [A] is reduced to 0.06 M.

Q.25 How many mL of a 0.1M HCl are required to react completly with 1gm mixture of Na_2CO_3 and $NaHCO_3$ containing equimolar amounts of two?
(b) Calculate the depression in freezing point of water, when 10 gm of $CH_3CH_2CHClCOOH$ is added to 250 gm of water. Given K_a for water is 1.4×10^{-3}.

Q.25 (a) How will you convert: (i) Benzaldehyde to benzyl alcohol·
(ii) Benzene to biphenyl (iii) Benzene to toluene
(b) Why are carboxylic acids more strong acids than phenols?

Q.26 (a) The time taken for 10% completion of first order reaction at 298K is equal to that required for its 25% completion at 308K. If the value for 'A' is 4×10^{10} sec^{-1}, calculate k.
(b) The half period for the conversion of ammonium cyanate into urea at 303 K at initial concentration of 0.1 M and 0.2 M are 1152 and 568 min respectively. What is the order of reaction?