CLASS 12TH

PAPER CHEMISTRY

Time : 3 hrs. **M. M. – 70 Marks**

NOTE : Q. No. 1 has 28 parts carrying 1 mark each.

Q. No. 2 to 11 carry 2 marks each.

Q. No. 12 to 15 carry 3 marks each.

Q. No. 16 to 17 carry 5 marks each.

Q1. Comprehension

Lyophilic sols are more stable than lyophobic sols. This is due to the fact that lyophilic colloids are extensively solvated, i.e., colloidal particles are covered by a sheath of the liquid in which they are dispersed.
Lyophilic colloids have a unique property of protecting lyophobic colloids. When a lyophilic sol is added to the lyophobic sol, the lyophilic particles form a layer around lyophobic particles and thus protect the latter from electrolytes. Lyophilic colloids used for this purpose are called protective colloids

Answer the followings

i. Which type of colloids are stable in nature?
ii. Define lyophilic colloids.
iii. Which type of colloids undergo solvation?
iv. What are protective colloids?
v. How protection of colloids can be done?

True/False

vi. The C-X bond length in halobenzene is smaller than C-X bond length in CH_3-X (T/F)
vii. Alcohols are weaker acids than water (T/F)
viii. Carboxylic acids are more acidic than phenols. (T/F)
ix. Keratin is fibrous protein (T/F)
x. Aliphatic Amines are more basic than NH_3 (T/F)

xi. which of the following aqueous solutions have should have the highest boiling point :
(a) 1.0 M NaOH (b) 1.0 M Na_2SO_4 (c) 1.0 M NH_4NO_3
(d) 1.0 M KNO_3

xii. Colligative properties depends upon :

(a) Nature of solute particles present in the solution
(b) Nature of solute particles present in the solution
(c) Physical properties of the solute particles
(d) Nature of the solvent particles

xiii. The value of Henry's constant :

(a) Increases with increase in temp (b) decreases with increase in temp (c) remains contant (d) first increases the decreases

xiv. 18 g of glucose is dissolved in 1kg of water at what temp will the water boil , k_b for water is 0.52 K kg mol^{-1}

(a)373.2 K (b) 378.2 K (c) 381.5 K (d)

xv. Which of the followings oxidation state of oxygen is +2

(a) Cl_2O (b) O_2F_2 (c) OF_2 (d) N_2O

xvi. Ethanol upon heating with conc. H_2SO_4 at 443 k gives:

(a) Diethyl ether (b) Ethylene
(c) Ethyl hydrogen sulphate (d) none of these

xvii. Oxidation state of Fe in $[Fe(CN)_6]^{3-}$

(a) +3 (b) +2 (c) +4 (d) -3

xviii. IUPAC name of the complex $K_3[Fe(CN)_6]$ is

(a) potassium hexacyanoferrate (II) (b) potassium hexacyanoferrate (III) (c) potassium hexacyanoiron (II) (d) tripotassium hexacyanoiron (II)

xix. Which among the followings is disaccharides
(a) Glucose b) cellulose (c) Sucrose (d) starch

xx. Which among the followings is globular protein ?
(a) Albumin (b) Keratin (c) collagen (d) None of the above

xxi. Which among the following is secondary amine:
(a) CH_3NH_2 (b) $(CH_3)_3N$
(c) CH_3NHCH_3 (d) $CH_3CH_2NH_2$

xxii. Alkyl cyanide upon reduction with Na/ethanol gives
(a) Carboxylic acids (b) primary amines
(c) sec- amine (d) tert-amine

xxiii. Which among the followings is most acidic?
(a) Acetic acid (b) Formic acid
(c) Chloroacetic acid (d) Ethanol

xxiv. Which among the followings undergoes cannizzaro's reaction?
(a) Ethanal (b) Benzaldehyde
(c) Propanal (d) None of above

xxv. When alipahtic aldehydes are treate with fehling solution, following observation is obtained
(a) White ppt coluration (b) red coluration (c) Orange colouration (d) Brown

xxvi. In Clemmensen reduction the reducing agent used is
(a) Na / ethanol (b) Zn-Hg /HCl (c) Mg-Hg/H_2O (d) $LiAlH_4$

xxvii. One Faraday contains the charge
(a) 95000C (b) 96500 C (c) 94500 C (d) 95600 C

xxviii. XeF_2 has linear structure because
(a) Xe is sp^3d^2 hybridized having 6 bp and 1lp (b) Xe is sp^3d^2 hybridized having 4 bp and 2 lp (c) Xe is sp^3d hybridized having 2 bp and 3 lp
(d) Xe is sp^3 hybridized having 3 bp and 1lp

Section-B Two Mark Questions

Q2 The vapour pressure of 2.1% of an queous solution pf a non electrolyte at 373 k is 755 mm calculate the molar mass of solute

OR

When 1.80 gm of non volatile compound is dissolved in 25 g of acetone, the solution boils at 56.86 C while pure acetone boils at 56.38 C under the same atmospheric pressure calculate the molar mass of the compound .K_b for acetone is 1.72 K kg mol^{-1}

Q3. What is specific conductance of a solution ? How it varies with dilution ?

Q4. A first order reaction is found to have a rate constant k =5.5 $X10^{-14}$ sec^{-1} Find the half life period

OR

A first order reaction is 75% completed in 40 minutes , calculate its half life period

Q5. Why does NCl_5 not exist ?

OR

Oxygen is a gas while sulphur is solid . explain

Q6. Why nitrous acid is oxidant as well as reductant ?

OR

What is the basicity of H_3PO_4 and why ?

Q7. Why transition metals act as good catalysts?

Q8. Why are Mn^{2+} compounds more stable than Fe^{2+} towards oxidation to their +3 state?

Q10. What is meant by unidentate and ambidentate ligands? Give two examples for each.

OR

$[Fe(CN)_6]^{4-}$ and $[Fe(H_2O)_6]^{2+}$ are of different colours in dilute solutions. Why?

Q11. Explain the factors affecting rate of a reaction.

Section-C Three Mark Questions

Q12. Calculate the potential of hydrogen electrode in contact with a solution whose

Q13. Compare and explain the reactivity **OR** different alcohols towards sodium.

Q14. For a first order reaction, show that time required for 99% completion is twice the time required for the completion of 90% of reaction.

OR

A first order reaction takes 40 min for 30% decomposition.
Calculate half life period.

Q15. Why is dioxygen a gas but sulphur a solid?

Section-D Five Mark Questions

Q16. Explain giving reasons-

(i) Transition metals and many of their compounds show paramagnetic behav iour. (1)
(ii) The enthalpies of atomisation of the transition metals are high. (2)
(iii) The transition metals generally form coloured compounds. (2)

(i) n-butyl chloride is treated with alcoholic KOH
(ii) bromobenzene is treated with Mg in the presence of dry ether
(iii) ethyl chloride is treated with aqueous KOH
(iv) methyl bromide is treated with sodium in the presence of dry ether
(v) methyl chloride is treated with KCN ?

(iii) The d^1 configuration is very unstable in ions.(1)

Q17. What happens when-

OR

(i) Sandmeyer's reaction
(ii) Finkelstein reaction
(iii) Hundsdiecker reaction
(iv) Fittig reaction
(v) Ullmann reaction