

## 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

- Which type of colloids are stable in nature?
- Define lyophilic colloids.
- Which type of colloids undergo solvation?
- What are protective colloids?
- How protection of colloids can be done?

#### True/False

- The C-X bond length in halobenzene is smaller than C-X bond length in  $\text{CH}_3\text{-X}$  (T/F)
- Alcohols are weaker acids than water (T/F)
- Carboxylic acids are more acidic than phenols. (T/F)
- Keratin is fibrous protein (T/F)
- Aliphatic Amines are more basic than  $\text{NH}_3$  (T/F)
- which of the following aqueous solutions have should have the highest boiling point :  
(a) 1.0 M NaOH                      (b) 1.0 M  $\text{Na}_2\text{SO}_4$                       (c) 1.0 M  $\text{NH}_4\text{NO}_3$   
(d) 1.0 M  $\text{KNO}_3$

- 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 constant
  - (d) first increases then decreases
- xiv. 18 g of glucose is dissolved in 1kg of water at what temp will the water boil ,  
 $k_b$  for water is  $0.52 \text{ K kg mol}^{-1}$
- (a) 373.2 K
  - (b) 378.2 K
  - (c) 381.5 K
  - (d)
- xv. Which of the following oxidation state of oxygen is +2
- (a)  $\text{Cl}_2\text{O}$
  - (b)  $\text{O}_2\text{F}_2$
  - (c)  $\text{OF}_2$
  - (d)  $\text{N}_2\text{O}$
- xvi. Ethanol upon heating with conc.  $\text{H}_2\text{SO}_4$  at 443 K gives:
- (a) Diethyl ether
  - (b) Ethylene
  - (c) Ethyl hydrogen sulphate
  - (d) none of these

- xvii. Oxidation state of Fe in  $[\text{Fe}(\text{CN})_6]^{3-}$   
 (a) +3    (b) +2    (c) +4    (d) -3
- xviii. IUPAC name of the complex  $\text{K}_3[\text{Fe}(\text{CN})_6]$  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)  $\text{CH}_3\text{NH}_2$     (b)  $(\text{CH}_3)_3\text{N}$   
 (c)  $\text{CH}_3\text{NHCH}_3$     (d)  $\text{CH}_3\text{CH}_2\text{NH}_2$
- 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 aliphatic aldehydes are treated with fehling solution, following observation is obtained  
 (a) White ppt    (b) red colouration    (c) Orange colouration    (d) Brown colouration
- xxvi. In Clemmensen reduction the reducing agent used is  
 (a) Na / ethanol    (b) Zn-Hg /HCl    (c) Mg-Hg/H<sub>2</sub>O    (d)  $\text{LiAlH}_4$
- xxvii. One Faraday contains the charge  
 (a) 95000C    (b) 96500 C    (c) 94500 C    (d) 95600 C
- xxviii.  $\text{XeF}_2$  has linear structure because  
 (a) Xe is  $\text{sp}^3\text{d}^2$  hybridized having 6 bp and 1lp    (b) Xe is  $\text{sp}^3\text{d}^2$  hybridized having 4 bp and 2 lp  
 (c) Xe is  $\text{sp}^3\text{d}$  hybridized having 2 bp and 3 lp  
 (d) Xe is  $\text{sp}^3$  hybridized having 3 bp and 1lp



## Section-B Two Mark

### Questions

Q2 The vapour pressure of 2.1% of an aqueous solution of 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  $1.72 \text{ K kg mol}^{-1}$

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  $k = 5.5 \times 10^{-14} \text{ sec}^{-1}$  Find the half life period

**OR**

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

Q5. Why does  $\text{NCl}_5$  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  $\text{H}_3\text{PO}_4$  and why ?

Q7. Why transition metals act as good catalysts?

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

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

**OR**

$[\text{Fe}(\text{CN})_6]^{4-}$  and  $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$  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 of 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 behaviour. (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, acts as good catalyst. (2)
- (iv) methyl bromide is treated with sodium in the presence of dry ether, undergoes oxidative coupling
- (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