

CHEMISTRY

CLASS: XII

MARKS:70  
Time : 3 hrs.

QUESTION -1

(a) Fill in the blanks:

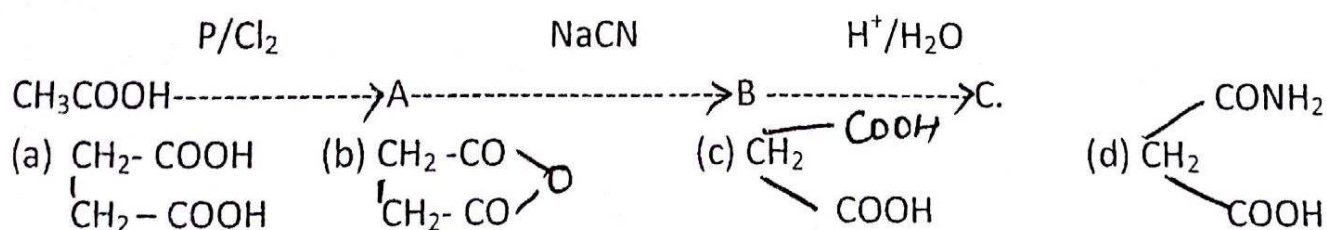
[4]

- (i) Alums purify muddy water by-----.
- (ii) A colloidal system in which gas bubbles are dispersed in a liquid is known as-----.
- (iii) -----is used for treatment of lead poisoning.
- (iv) The depression in freezing point for 1Murea,1Mglucose,1MNaCl are in the ratio-----
- (v) On distillation with zinc dust phenol is converted to-----.
- (vi) Calcium formate and calcium acetate mixture is subjected to dry distillation,----- is obtained.
- (vii) Sodium acetate on heating with sodalime gives-----.
- (viii) The chlorofluoro carbon compounds of methane and ethane are collectively known as-----.

(b) Choose the correct alternatives:

[4]

- (i) Acetic acid on heating with  $P_2O_5$  gives  
(a) methanol (b) acetic anhydride (c) acetaldehyde (d) *ethane nitrile*
- (ii) Which of the following reactions does benzaldehyde not undergo  
(a) Aldol condensation (b) benzoin condensation (c) perkin reaction  
(d)cannizaro reaction.
- (iii) Which of the following will respond positively to the iodoform test  
(a)  $CH_3OH$  (b)  $(CH_3)_2CHOH$  (c)  $(CH_3)_3COH$  (d)  $C_3H_7OH$
- (iv) In the reaction



(v) Blood can be purified by

- (a) Dialysis (b) coagulation (c) filtration (d) electro osmosis

- (vi) Which acts as autocatalyst during titration of  $\text{KMnO}_4$  and oxalic acid in presence of sulphuric acid  
 (a) Oxalic acid (b)  $\text{H}_2\text{SO}_4$  (c)  $\text{KMnO}_4$  (d)  $\text{MnSO}_4$
- (vii) A plot of  $\log x/m$  versus  $\log p$  for the adsorption of a gas on a solid gives a straight line with slope equal to  
 (a)  $1/n$  (b)  $\log K$  (c)  $-\log K$  (d)  $n$
- (viii) The half life of a first order reaction is 10 minutes. If initial amount is 0.08 mol/L and concentration at some instant is 0.01 mol/L then time is  
 (a) 10 min (b) 30 min (c) 20 min (d) 40 min

(c) Match the following:

[4]

- |                              |                       |
|------------------------------|-----------------------|
| (i) Werners                  | Fire extinguisher     |
| (ii) DDT                     | gel                   |
| (iii) Cod liver oil          | dry cleaning          |
| (iv) tetrachloroethene       | coordination compound |
| (v) Chlorofluro carbons      | emulsion              |
| (vi) Soap sol                | aerosol spray         |
| (vii) Cheese                 | persistent pesticide  |
| (viii) Carbon tetra chloride | associated colloid    |

(d) Answer the following:

[8]

- (i) What mass of naphthalene  $\text{C}_{10}\text{H}_8$  would have to be dissolved in 200 g of octane to lower the vapor pressure of pure octane by 20%
- (ii) (a) Define Gold number  
 (b) How can activation energy be calculated graphically?
- (iii) Write equations to represent  
 (a) Benzoin condensation (b) aldol condensation (c) Swarts reaction  
 (d) perkins reaction

### QUESTION -2

Write the products in the following:

[2]

- (i)  $\text{CH}_3\text{-CH=C(CH}_3)_2 + \text{HCl} \xrightarrow{\text{peroxide}}$   
(ii)  $\text{CH}_3\text{-CO-CH}_3 + \text{NH}_2\text{OH} \xrightarrow{\hspace{2cm}}$

### QUESTION - 3

Write equation to represent the extraction of (i) copper (ii) silver

[2]

### QUESTION -4

Convert phenol to benzoic acid

[2]

### QUESTION -5

How will you distinguish between :

[2]

- (i) Benzaldehyde and acetaldehyde      (ii) benzoic acid and acetic acid

### QUESTION - 6

- (i) State Henry's law. [2]  
(ii) Equimolar solutions of NaCl and BaCl<sub>2</sub> are prepared in water. Freezing point of NaCl is found to be -2°C. What is the freezing point for BaCl<sub>2</sub> solution.

### QUESTION - 7

- (i) Give two differences between order and molecularity of a reaction. [2]  
(ii) What type of plot do you expect for rate versus time for a reaction of zero order reaction.

### QUESTION - 8

- (i) Write the IUPAC names of the following compounds: [2]  
(a)  $[\text{Ni}(\text{NH}_3)_6] \text{Cl}_2$       (b)  $[\text{Cr}(\text{H}_2\text{O})_4 \text{Cl}_2] \text{NO}_3$   
(ii) What type of isomers are  $[\text{Co}(\text{NH}_3)_5 \text{Br}] \text{SO}_4$  and  $[\text{Co}(\text{NH}_3)_5 \text{SO}_4] \text{Br}$ ? Give a chemical test to distinguish between the two isomers.

### QUESTION- 9

[2]

- (i) What happens when a freshly precipitated Fe(OH)<sub>3</sub> is shaken with a little amount of dilute solution of FeCl<sub>3</sub>. What is the process called?  
(ii) Lyophilic sol are stable than lyophobic sol why?

**QUESTION- 10**

A first order reaction is 50% completed in 30 minutes at 27°C and in 10 minutes at 47°C. Calculate reaction rate constant at 27°C and activation energy in KJ/mol

$$[R = 8.314 \text{ J/K/mol}]$$

[3]

**QUESTION- 11**

Predict the hybridization, geometry and magnetic behaviour of the following:

[3]

- (a)  $[\text{Ni}(\text{CO})_4]$                       (b)  $[\text{Ni}(\text{CN})_4]^{2-}$

**QUESTION -12**

[3]

17.4%  $\text{K}_2\text{SO}_4$  solution at 27°C is isotonic with 4% NaOH solution at the same temperature. If NaOH is completely ionized what is the degree of ionization of  $\text{K}_2\text{SO}_4$  in aqueous solution.

$$[R = 0.0821 \text{ L atm/K/mol}]$$

**QUESTION - 13**

Give reasons for the following:

[3]

- (a) Gelatin is added to ice creams.  
 (b) Sky appears blue in colour.  
 (c) Physisorption decrease with increase in temperature.

**QUESTION- 14**

Write the steps involved in the extraction of iron. Write the equation.

[3]

**QUESTION- 15**

An organic compound A has molecular formula  $\text{C}_7\text{H}_6\text{O}$ . When A is treated with NaOH followed by acid hydrolysis gives two products B and C. when B is oxidized it gives A. When A and C are each treated separately with  $\text{PCl}_5$  they give two different organic products D and E

- (i) Identify A to E [3]  
 (ii) Give the chemical equation when A is treated with NaOH and name the reaction.

**QUESTION- 16**

Convert:

[3]

- (i) Ethanoic acid to propanoic acid      (ii) Ethanol to propanol  
 (ii) Benzoic acid to toluene

### QUESTION -17

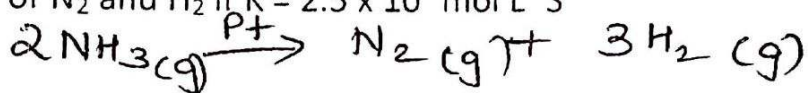
Give reasons:

- (i) Chloroacetic acid is more acidic than acetic acid.
- (ii) Phenols do not undergo substitution of the -OH group like alcohols.
- (iii) Grignard reaction should be prepared in anhydrous condition.

[3]

### QUESTION -18

- (i) 0.85% aqueous solution of  $\text{NaNO}_3$  is 90% dissociated at  $27^\circ\text{C}$ . Calculate its osmotic pressure ( $R = 0.0821 \text{ LatmK}^{-1} \text{ mol}^{-1}$ ) [2]
- (ii) State Hardy- Schulze rule. [1]
- (iii) The decomposition of  $\text{NH}_3$  on platinum surface is zero order. What are the rates of production of  $\text{N}_2$  and  $\text{H}_2$  if  $K = 2.5 \times 10^{-4} \text{ mol L}^{-1} \text{ s}^{-1}$  [2]



### QUESTION- 19

Write the balanced chemical equation and name the reaction .

[5]

- (i)  $\text{CH}_3\text{COOH} + \text{Cl}_2 \xrightarrow{\text{red P, } \Delta}$
- (ii)  $\text{C}_6\text{H}_5\text{OH} + \text{C}_6\text{H}_5\text{COCl} \xrightarrow{\text{dil. NaOH}}$
- (iii)  $\text{CH}_3\text{CHO} \xrightarrow[\text{(ii) KOH, glycol, 453K}]{\text{(i) NH}_2\text{NH}_2}$
- (iv)  $\text{C}_6\text{H}_5\text{Cl} + \text{Na} \xrightarrow{\text{dry ether}}$