

Model Question- 6
Chemistry XII

Time :3 hours
Attempt all questions

Full marks: 75

Group A: Multiple Choice Questions (11 * 1 = 11)

Time 25 Minutes

Tick the correct answer.

1. Phenolphthalein is not a good indicator for titrating
 - a. NaOH against oxalic acid
 - b. Oxalic acid against KMnO_4
 - c. NaOH against H_2SO_4
 - d. NaOH against HCl
2. All electrophiles are
 - a) Arrhenius acid
 - b) Bronsted base
 - c) Lewi's base
 - d) Lewi's acid
3. For a reaction, $t_{1/2} \propto$ the order of the reaction is
 - a) 0
 - b) 2
 - c) 1
 - d) 3
4. . Ore of aluminium is
 - (a) bauxite
 - (b) hematite
 - (c) dolomite
 - (d) None of these
5. Atomic radii of d-block elements in a series
 - a. decreases with increase in atomic number
 - b. increases with increase in atomic number
 - c. remains constant
 - d. none of the above
6. Which of the following sulphides when heated strongly in air gives the corresponding metal without undergoing separate reduction of oxide?
 - (a) Cu_2S
 - (b) FeS
 - (c) HgS
 - (d) ZnS
7. What product is obtained when nitromethane is heated with chlorine in presence of NaOH
 - (a) Chloropicrin
 - (b) Methanamine
 - (c) Chloretone
 - (d) Ethanamine
8. Gilman's reagent is,
 - (a) R_2Cd
 - (b) R_2CuLi
 - (c) RLi
 - (d) RMgX
9. Radioactive has an unstable nucleus and undergoes radioactive decay.
 - a. Isotope
 - b. Atom
 - c. Radioisotope
 - d. None of these
10. Before final drying of paper, the amount of H_2O is reduced to
 - (a) 5-6%
 - (b) 99.5%
 - (c) 60-65%
 - (d) 10%
11. The drugs used for the treatment of thyroid fever is
 - a) Novalgin
 - (b) Quinoline
 - (c) Chloromycetin
 - (d) Paracetamol

Group 'B'

Short Answer questions. (Attempt all the questions)

11. Volumetric analysis is a quantitative method in which based on the law of equivalence?
- Define endpoint and equivalence point. [2]
 - 4 gm of divalent metal was dissolved in 100 cc of 2M H_2SO_4 ($f = 1.01$). The excess acid requires 30 cc of 1N NaOH for complete neutralization. Find the atomic mass of metal. [3]
2. Draw energy profile diagram for exothermic and endothermic reaction. What is Gibb's free energy? Derive Gibb's Helmholtz equation. What is standard heat of formation? [2+1+1+1]
3. What is zinc spelter? Write the important characteristics of transition elements. Why is the mcompound of zinc colourless? [1+3+1]
4. TWhat happens when caustic soda is treated with i. calomel ii.corrosive sublimate? Name one important ore of iron with molecular formula. What is blister copper? Write one use of white vitriol. [2+1+1+1]
5. When 2-bromopentane reacts with alc.KOH, pent-2-ene is formed as the major product, write the reaction. Which rule predicts the major product ? State the rule and write the justification for the rule. Convert 2-Chloropropane to 1-Chloropropane. [1+1+1+2]
- OR
- Prepare propan-1-ol, propan -2-ol, 2-methyl propan -2-ol and benzoic acid by using Grignard reagent. What products would you expect to get by the action of water on n-propyl magnesium iodide ? (4+1)
6. When benzamide is allowed to react with bromine in presence of KOH solution, it gives the compound which is steam volatile in nature.
- Write down the reaction involved and identify the compound [2]
 - What happens when the compound is warmed with chloroform and alcoholic potassium hydroxide? [1]
 - How would you convert the compound into orange red dye? [2]
7. Ethyl alcohol is alcoholic beverages that can be manufactured by fermentation process. So prepare ethyl alcohol in industrial sector. [5]
8. What is azo – dye? Write any two characteristics of dyes with suitable examples. [3]
- Differentiate between thermoplastics and thermosetting plastics with suitable examples. [2]

Group 'C';

Long Answer questions.

9. a) How strong electrolyte differs from the weak electrolyte. Derive the mathematical equation for Ostwald's dilution law. (2+3)
- b) What is conjugate acid-base pair? Write the conjugate acid-base pair of H_2S and NH_3 . (3)
- OR
- a) What is a calomel electrode? Why is this electrode used as a reference electrode? [2]

b) Give the reason why the blue colour of copper sulphate solution is discharged when an iron rod is dipped in it. Given $E_{\text{Cu}^{2+}/\text{Cu}}^0 = 0.34\text{V}$ and $E_{\text{Fe}^{2+}/\text{Zn}}^0 = -0.44\text{V}$. [2]

c) Given that,

$$E_{\text{Cu}^{2+}/\text{Cu}}^0 = +0.34\text{V}, \quad E_{\text{Zn}^{2+}/\text{Zn}}^0 = -0.76\text{V}, \quad E_{\text{Ag}^+/\text{Ag}}^0 = 0.80\text{V}$$

Can we store:

i. Copper sulphate solution in zinc vessel?

ii. Copper sulphate solution in a silver vessel? [2+2]

Give a suitable explanation.

10. Write the equations for (5)

i)

a) excess ethanol is heated with conc. H_2SO_4 at 140°C

b) ethanol is heated with excess H_2SO_4 at 160°C - 170°C

c) 2-methylpropan-2-ol vapour is passed through heated copper at 300°C

d) Ethanol is refluxed with SOCl_2 in the presence of pyridine

e) Ethanol reacts with sodium metal

ii. write short notes on:

(3)

a) Kolbe reaction

b) Reimer-Tiemann reaction

11. i) Compound "A" ($\text{C}_5\text{H}_{12}\text{O}$) does not react with phenyl hydrazine. Oxidation of "A" with $\text{K}_2\text{C}_2\text{O}_7/\text{H}^+$ gives "B" ($\text{C}_2\text{H}_{10}\text{O}$). Compound "B" reacts with phenyl hydrazine but does not give Tollen's test. The original compound "A" can be dehydrated with H_2SO_4 give a hydrocarbon "C" (C_5H_{10}). Ozonolysis of the hydrocarbon "C" give acetone and acetaldehyde. Identify compounds A, B and C. (5)

ii) Convert acetone to methanal. (2)

iii) What happens when ethanal is treated with saturated solution of Sodium bisulphite? (1)

OR

A) Methanoic acid is the first member of the monocarboxylic acid and shows many reactions of an aldehyde. How does formic acid resembles with aldehyde? Explain with reason and necessary reactions (5)

B) Give reasons

a) Chloroacetic acid is stronger acid than acetic acid (1.5)

b) The molecular weight of acetic acid is 60 but practically calculated as 120. (1.5)