

Model Question- 7
Chemistry XII

Time :3 hours
Attempt all questions

Full marks: 75

Group 'A'

Circle the best alternative to the following questions. [11 × 1 = 11] Time: 25 mins

1. A solution contains 4 g of NaOH in 2 liters of solution, its normality is
a. 0.1 N b. 0.0125N c. 0.125 N d. 0.5 N
2. The pH of 0.02 M NaOH is

- a. 1 b. 10.3 c. 12.3 d. 13.3
3. Which of the following statements is incorrect about the collision theory of chemical reaction?
- b. It considers reacting molecules or atoms to be hard spheres and ignores their structural features.
- c. Number of effective collisions determines the rate of reaction.
- d. Collision of atoms or molecules possessing sufficient threshold energy results in product formation.
- e. Molecules should collide with sufficient threshold energy and proper orientation for the collision to be effective.
4. The cell used in a cellphone is
- a. primary cell b. secondary cell c. fuel cell d. galvanic cell
5. The density of transition metals in a series
- a. decreases gradually b. increases gradually
- c. remains constant d. may increase or decrease
6. Which of the following slags is produced during extraction of iron?
- a. CaSiO_3 b. FeSiO_3 c. MgSiO_3 d. ZnSiO_3
7. Reactivity order in nitration is
- a. benzene < nitrobenzene < bromobenzene < toluene
- b. nitrobenzene > benzene > bromobenzene > toluene
- c. benzene > nitrobenzene > bromobenzene > toluene
- d. toluene > benzene > bromobenzene > nitrobenzene
8. Reaction between methyl magnesium bromide and carbondioxide gives
- a. CH_3COOH b. CH_3CHO c. HCOOH d. $\text{CH}_3\text{CH}_2\text{OH}$
9. The colored cement(white cement) consists of Percentage of pigment
- a. 2-4 b. 8-12 c. 4-10 d. 5-10
10. The reaction of alcoholysis of ester is called
- a) Esterfication b) Trans-esterification
- c) Saponification d) Hydrolysis
11. Phenol on treatment with conc. HNO_3 in the presence of conc. H_2SO_4 gives
- a) m-nitrophenol b) O- nitrophenol
- c) p- nitrophenol d) Picric acid

Attempt all the questions:

Group ' B '

Short Answer Questions: [8×5=40]

1. What is equivalent weight? What volume of 95% sulphuric acid (density = 1.85 g/cc) and what mass of water must be taken to prepare 100 cc of 15% Solution of sulphuric acid (density = 1.1 g/cc)? [1+4]

OR

- a. Define the half-life period of a reaction. The half-life periods of two reactions A and B are 3.21×10^2 minute and 569 minutes respectively. Which of these is a faster reaction? [3]
- b. What is enzyme catalysis.write its characteristics. [2]

2. Under what condition is the reaction expected to occur.
- spontaneous
 - Non-spontaneous, if both ΔH and ΔS are positive for the reaction?
 - Calculate the enthalpy of formation of NH_3 from the following equation.



Define enthalpy of reaction.

[2+2+1]

3. Why most of the transition elements exhibit the catalytic property? How is calomel prepared? Write a balanced chemical equation involved. Write the action of heat on blue vitriol.
4. Draw a well labelled diagram for roasting and distillation during the extraction of mercury from cinnabar. What is lithopone? Write its one important use. Write the chemical reaction involved in zone of combustion of blast furnace during the extraction of cast iron.
5. An organic compound (A) $\text{C}_2\text{H}_6\text{O}$ reacts with sodium to form a compound (B) with evolution of H_2 gas and gives a yellow compound (C) when heated with I_2 and NaOH . When (A) is heated with conc. H_2SO_4 at 140°C it gives a compound (D) $\text{C}_4\text{H}_{10}\text{O}$ which on treatment with excess of conc. HI gives (E). (D) is also obtained when (B) is heated with (E). Identify (A), (B), (C), (D) and (E) and write the reaction involved.

[1+1+1+1+1]

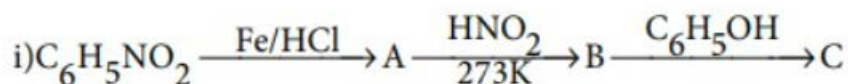
OR

Chloroalkane is hydrolysed easily with aqueous NaOH but Chlorobenzene requires high temperature and high pressure. Give the proper reason. What happens when chlorobenzene is heated with Na metal in the presence of dry ether? Convert chlorobenzene into 1,3-dichlorobenzene.

[2+1+2]

6. Write the equations for
- Excess ethanol is heated with conc. H_2SO_4 at 140°C
 - Ethanol is heated with excess H_2SO_4 at 160°C - 170°C
 - 2-Methylpropan-2-ol vapour is passed through heated copper at 300°C
 - Ethanol is refluxed with SOCl_2 in the presence of pyridine
 - Ethanol reacts with sodium metal
7. Identify compounds A, B and C in the following sequence of reactions.

[1+1+1+1+1]



[3]

- Write the product when compound B is hydrolyzed? [1]
- What product would you get when compound A is reduced with LiAlH_4 ? [1]

8.A. What is condensation polymerization? what are the starting materials for

- Nylon 66 [3]
- Dacron
- Bakelite

[1+1+1]

B. what is the basic composition of Portland cement. What raw material is used in the manufacture of this cement? Describe method [1+1]

Group-C

Long Answer Questions [3 x 8=24]

- 9.
- What happens when HCl gas is passed through an impure solution of common salt? [2]
 - write short notes on salt hydrolysis. [3]
 - The solubility product of AgCl in water is 1.0×10^{-10} at 25°C. Calculate its solubility
a) pure water b) 0.02 M KCl solution c) ppt of AgCl in g/l [Ag=108, Cl=35.5] (3)

OR

- What is fuel cell? Write short notes on hydrogen- oxygen fuel cell. [4]
 - Distinguish between extensive and intensive properties. [2]
 - The latent heat of fusion of ice is 336J/g. Calculate the molar entropy of fusion of ice at its melting point. [2]
- 10 A. Chloroacetic acid is stronger acid than acetic acid, why? [2]
- The molecular weight of acetic acid is 60 but practically calculated as 120. Give reason. [2]
- C. What happens when
- Nitrobenzene is electrolyzed in acidic medium
 - Phenol is treated with excess of aq. Bromine.
 - Phenol is treated with conc. HNO₃ in presence of conc. H₂SO₄.
 - 2-methylpropan-2-ol vapour is passed through heated copper at 300°C. [1+1+1]
11. i. An organic compound (A) react with PBr₃ to give (B). Compound (B) produces (C) when heated with alc. KOH. The compound (C) undergoes ozonolysis to yield ethanal and methanal as major products. The compound (A) responds iodoform test. Identify A, B, C and write reactions involved. How is (A) obtained from CH₃MgBr. (4+1)
- Give a chemical test to distinguish between benzaldehyde and formaldehyde. [2]
 - Convert acetaldehyde into lactic acid. [1]

OR

A nitrogen containing compound evolved very bad smell on heating with CHCl₃ and alc. KOH.

- Identify the compound. What happens when that compound is treated with phenyldiazonium chloride salt in presence of acid? [1+2]
- Why primary amines have higher boiling point than tertiary amines? [2]
- Why primary amines have higher boiling point than tertiary amines? [2]
- Arrange the following compound in the decreasing order of basic strength.

