

Grade: XII

Time: 3 Hrs

Candidates are required to give their answer in their own words as far as practicable. The figures in the margin indicate full marks.

## Group A

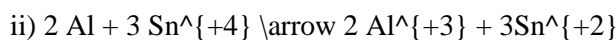
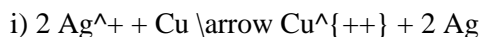
Attempt any fifteen questions.

1. How would you interpret that all four C-H bonds of methane are identical? 2
2. Starting from benzene, how will you synthesize 1+1
  - i) benzenehexachloride ?
  - ii) acetophenone ?
3. What happens when the product obtained by heating ethanol with bleaching powder paste is heated with silver powder? 2
4. The boiling point of n-butyl alcohol is greater than its isomer ethoxyethene. Why? 2
5. What happens when- 1+1
  - i) Phenol is condensed with phthalic anhydride?
  - ii) Phenol reacts with aqueous bromine?
6. Convert methoxymethane to 1+1
  - i) methoxyethane
  - ii) methanol
7. For what purpose the following tests are used 1+1
  - i) Tollen's test?
  - ii) Iso-cyanide test?
8. Show your familiarity with 1+1
  - i) Hell - volhard - zelinsky reaction
  - ii) Claisen condensation
9. Why is aniline less basic than methylamine? 2
10. Define denaturation of protein. What are the essential conditions for this? 1+1
11. What are reducing and non reducing sugar? Give an example of each. 1+1
12. What are natural and synthetic polymers? Give an example of each. 1+1
13. Give an example of each of the following: [0.5  $\times$  4=2]
  - i) Phosphorus fertilizer
  - ii) Insecticide
  - iii) azo - dye
  - iv) analgesic drug

26. Define end point & indicator. 3.12 gm of washing soda ( $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ ) were dissolved in 200 ml of water. 20 ml of resulting solution is titrated with 21.8 ml of  $\frac{N}{10}$   $\text{H}_2\text{SO}_4$  for complete neutralization. Calculate the % of anhydrous  $\text{Na}_2\text{CO}_3$  in the crystal. [1+1+1.5+1.5]

27. Differentiate between electrolytic cell & galvanic cell. Predict the feasibility of reaction

[2+1.5+1.5]



Given:  $E^0_{\{\text{Ag}^+/\text{Ag}\}} = +0.80\text{ V}$ ,  $E^0_{\{\text{Cu}^{2+}/\text{Cu}\}} = +0.34\text{ V}$

$E^0_{\{\text{Sn}^{+4}/\text{Sn}^{+2}\}} = +0.15\text{ V}$ ,  $E^0_{\{\text{Al}^{+3}/\text{Al}\}} = -1.66\text{ V}$

28. Define Gibb's free energy. Derive Gibb's - Helmholtz equation. How can you predict the feasibility of exothermic reaction using Gibb's - Helmholtz equation. [1+2+2]

29. Name the chief ore of iron. Draw a neat labelled sketch of blast furnace for extraction of pig iron & write down chemical reactions involved at different zone. [1+4]

### Group C

Attempt any two questions. [2  $\times$  10=20]

30. Describe the preparation of methanoic acid in the laboratory. How is anhydrous acid obtained from it? How does methanoic acid act upon [5+2+1+1+1]

- i) Fehling's solution?      ii) ethanol/ $\text{H}^+$ ?  
iii) Conc.  $\text{H}_2\text{SO}_4$ ?

31. i) An alcohol (A) when heated with conc.  $\text{H}_2\text{SO}_4$  gives an alkene (B). When (B) is bubbled through bromine water & the product obtained is dehydrohalogenated with alcoholic KOH solution; a new compound (C) is obtained. The compound (C) gives (D) when treated with warm dil.  $\text{H}_2\text{SO}_4$  in presence of  $\text{HgSO}_4$ . (D) can also be obtained either by oxidising (A) with acidified  $\text{KMnO}_4$  or from acetic acid through its Calcium salt. Identify A, B, C, D.

ii) Convert the followings: [2+1.5+1.5]

- a) Benzene to m-bromophenol  
b) propanoic acid to ethanamine  
c) Nitrobenzene to acetanilide

42. Define the terms. [1  $\times$  6 + 4]

- i) salt hydrolysis      ii) Lewis acid  
iii) Ionic Product of water    iv) Degree of ionisation  
v) Solubility product      vi) Common ion effect

A sample of  $\text{AgCl}$  is treated with 5 ml of 2 M  $\text{Na}_2\text{CO}_3$  solution to produce  $\text{Ag}_2\text{CO}_3$ . The remaining solution contained 0.003 gm of  $\text{Cl}^-$  per liter. Calculate solubility product of  $\text{AgCl}$ .

( $K_{\text{sp}}$  of  $\text{Ag}_2\text{CO}_3 = 8.2 \times 10^{-12}$ )

33. Write short notes on (any two)

- i) Lab. preparation of chloroform  
ii) Extraction of zinc from zinc blende

iii) Chemistry of white vitrol

iv) Effect of temperature & catalyst on rate of reaction.