

## Common Instructions

- First 15 minutes is given as cool-off time.
- This time is to be spent for reading the question paper
- Attempt questions according to the instructions

Answer any four questions from 1 to 5 ( 1 Score each )

1. Find suitable relation and fill in the blanks.  
 Bauxite :  $\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$   
 Haematite : .....
2. Write the name of the functional group in the compound,  $\text{CH}_3\text{-CH}_2\text{-NH}_2$
3. Ammonium Chloride is heated strongly in a dry test tube. Identify the basic substance obtained.
4. Molten sodium Chloride ( $\text{NaCl}$ ) is electrolysed. Which substance is obtained at the cathode ?  
 (  $\text{H}_2$  ,  $\text{Na}$  ,  $\text{Cl}_2$  ,  $\text{O}_2$  )
5.  $\text{CH}_3\text{-CH}_2\text{-CH}_3 \xrightarrow{\text{Heat}} \text{CH}_3 + \text{'A'}$   
 Write the possible structural formula of 'A' ( 4x1 = 4)

Answer any four questions from 6 to 10 ( 2 Scores each)

6. a) Which metal among the given metals is highly reactive with cold water?  
 (  $\text{Mg}$  ,  $\text{Na}$  ,  $\text{Fe}$  )  
 b) Which is the gas produced by the above reaction?
7. Complete the table (Symbols are not real )

Element	Subshell Electronic Configuration	Period	Group
X	$1s^2 2s^2 2p^1$	2	'a'
Y	'b'	3	17

- 8 Some hints about a hydrocarbon are given below.
- It is an unsaturated hydrocarbon.
  - It contains four carbon atoms
  - There is a triple bond on the second carbon atom
- Write the structural formula of this compound.
  - Write its IUPAC name
- 9 Froth floatation process, hydraulic washing, magnetic separation, leaching etc are some methods for concentration of ores.
- Which of these methods is used for the concentration of copper pyrites?
  - Write the reason for choosing this method.
- 10 (i) Which type of energy change is occurring in an electrolytic cell?  
(ii) Acidified water is electrolysed. Which of the following reactions takes place at the cathode?
- $2\text{H}_3\text{O}^+(\text{aq}) + 2\text{e}^- \longrightarrow \text{H}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l})$
  - $2\text{H}_2\text{O}(\text{l}) \longrightarrow \text{O}_2(\text{g}) + 4\text{H}^+(\text{aq}) + 4\text{e}^-$

(4x2=8)

Answer any four questions from 11 to 15 (3 Scores each)



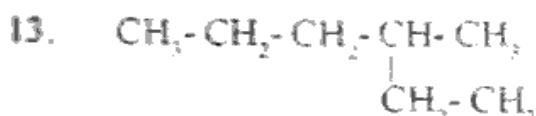
Answer the following questions related to this equilibrium.

- What is the effect of increase in concentration of  $\text{N}_2$  on the equilibrium? (1)
- What is the effect of pressure on this equilibrium? (1)
- 'In order to prevent the decomposition of  $\text{NH}_3$ , it should be kept at low temperature'. Comment on the statement. (1)

12. Analyse the table and answer to the given questions.

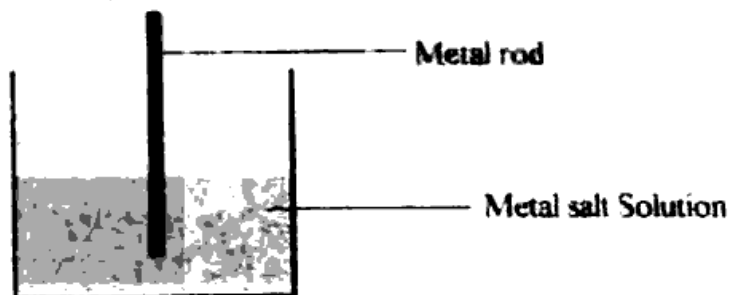
Metal	Refining method
Tin	'X'
Mercury	'Y'

- Write the name of Methods 'X' and 'Y'. (1)
- Which of the metal is utilised in each refining method? (2)

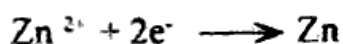


- How many carbon atoms are there in the main chain of the given compound? (1)
- Write the position number of the branch. (1)
- Write the IUPAC name of the compound. (1)

14. Arrangement of a displacement reaction is given in the picture. Here a metal rod is dipped in the salt solution of another metal.



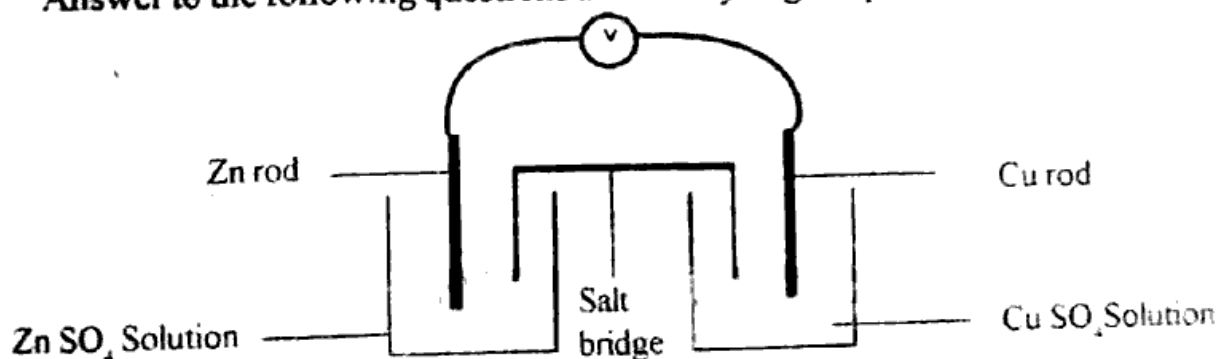
Equations of chemical reactions taking place here are given below.



- a) Which is the metal rod used here? (1)
- b) If copper rod is used instead of the above metal rod, is displacement reaction possible? Give reason (2)
- (Hint: Order of reactivity of metals  $\text{Ca} > \text{Mg} > \text{Al} > \text{Zn} > \text{Fe} > \text{Cu}$ )
15. Answer the following questions based on the compound Hex-3-ene.
- a) What is its molecular formula? (1)
- b) Write its structural formula. (1)
- c) Write the name of an alicyclic compound having the same molecular formula. (1)
- (4 X 3 = 12)

Answer any four questions from 16 to 20 (4 Scores each)

16. Answer to the following questions after analysing the picture.



Hint: Reactivity is in the order  $\text{Mg} > \text{Zn} > \text{Pb} > \text{Cu} > \text{Ag}$

- a) Electron flow starts from which electrode? (1)
- b) At which electrode, oxidation occurs? Write equation of chemical reaction taking place at this electrode. (2)
- c) We want to reverse the direction of electron flow. Which electrode out of Ag, Mg and Pb should be used instead of Cu? (1)

17 Complete the following table

Molecule	Mass (g)	Number of moles	Volume at STP (L)	Number of Atoms
H <sub>2</sub>	10	'a'	112	10 X 6.022 X 10 <sup>23</sup>
NH <sub>3</sub>	'b'	5	112	20 X 6.022 X 10 <sup>23</sup>
CO <sub>2</sub>	440	10	'c'	30 X 6.022 X 10 <sup>23</sup>
CH <sub>4</sub>	8	0.5	11.2	'd'

[ Hint : Atomic mass of C = 12 , H= 1 , N =14 , O =16] (1x4=4)

18. A) CH<sub>3</sub>-CH<sub>2</sub>-CHO

B) CH<sub>3</sub>CH<sub>2</sub>-CH<sub>2</sub>-OH

a) Write the family name of compounds having the functional group '-OH' (1)

b) Write the structural formula of the position isomer of the compound 'B' (1)

c) Write the structural formula and IUPAC name of a functional isomer of compound 'A' (2)

19. Aluminium is manufactured by the electrolysis of molten alumina (Al<sub>2</sub>O<sub>3</sub>)

a) Write the name of its method of production. (1)

b) Write equation for the reaction taking place at cathode during this electrolytic process. (1)

c) Different reducing agents are used for the production of aluminium and iron from their ores. Give reason (2)

20. (i) CH<sub>2</sub>=CH<sub>2</sub> + H<sub>2</sub>  $\xrightarrow{\text{Ni}}$  CH<sub>3</sub>-CH<sub>3</sub>

(ii) CH<sub>3</sub>-CH<sub>3</sub> + Cl<sub>2</sub>  $\xrightarrow{\text{Sunlight}}$  'A' + HCl

a) Identify the compound 'A' in (ii) (1)

b) Write the name of reaction (i) (1)

c) What is the product formed by the polymerisation of CH<sub>2</sub>=CH<sub>2</sub>? (1)

d) What are the products obtained by the complete combustion of the compound CH<sub>3</sub>-CH<sub>3</sub>?

( 4x4 =16)

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