

**DELHI PUBLIC SCHOOL, JAMMU**  
**CHEMISTRY ASSIGNMENT**  
**MONTH- DECEMBER**

**CLASS- XI**

**Section A**

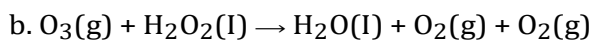
1. How much time would it take to distribute one Avogadro number of wheat grains if  $10^{10}$  grains are distributed each second? [1]  
**(Hint):**  $1N_A = 6.022 \times 10^{23}$
2. Name the different types of redox reaction. [1]
3. Why are lithium compounds soluble in organic solvents? [1]
4. [1]
5. Write the IUPAC name of following compounds. [1]  
$$\text{CH}_3 - \underset{\substack{| \\ \text{OH}}}{\text{CH}} - \text{CH}_2 - \text{OC}_2\text{H}_5$$
6. If  $Q_c < K_c$ , when we continuously remove the product, what would be the direction of the reaction? [1]

**Section B**

7. One of the assumptions of kinetic theory of gases is that there is no force of attraction between the molecules of a gas. State and explain the evidence that shows that the assumption is not applicable for real gases. [2]
8.  $\text{MnO}_4^{2-}$  undergoes disproportionation reaction in acidic medium but  $\text{MnO}_4^-$  does not. Give reason. [2]
9. Why are  $\text{BeSO}_4$  and  $\text{MgSO}_4$  readily soluble in water while  $\text{CaSO}_4$ ,  $\text{SrSO}_4$ , and  $\text{BaSO}_4$  are insoluble? [2]
10. How many  $\sigma$  and  $\pi$  bonds are present in each of the following molecules? [2]
  - i.  $\text{HC}\equiv\text{CCH}=\text{CHCH}_3$
  - ii.  $\text{CH}_2=\text{C}=\text{CHCH}$
11. How is benzene converted to benzene hexachloride? [2]

**Section C**

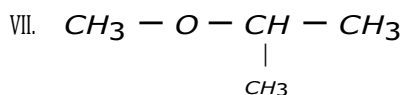
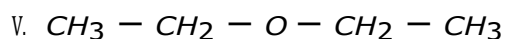
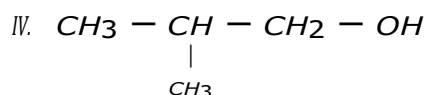
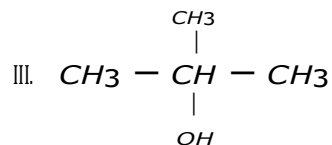
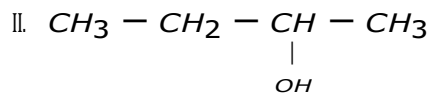
12. If 1 gram of each of the following gases  $\text{CO}$ ,  $\text{H}_2\text{O}$ ,  $\text{CH}_4$ , and  $\text{NO}$  are taken at STP, which of the gases will occupy [3]
  - a. greatest volume and
  - b. smallest volume?
13. Consider the reactions : [3]
  - a.  $6\text{CO}_2(\text{g}) + 6\text{H}_2\text{O}(\text{l}) \rightarrow \text{C}_6\text{H}_{12}\text{O}_6(\text{aq}) + 6\text{O}_2(\text{g})$
  - b.  $\text{O}_3(\text{g}) + \text{H}_2\text{O}_2(\text{l}) \rightarrow \text{H}_2\text{O}(\text{l}) + 2\text{O}_2(\text{g})$ 
    - i. Why it is more appropriate to write these reactions as :
      - a.  $6\text{CO}_2 + 12\text{H}_2\text{O}(\text{l}) \rightarrow \text{C}_6\text{H}_{12}\text{O}_6(\text{aq}) + 6\text{O}_2(\text{l}) + 6\text{O}_2(\text{g})$



ii. Also suggest a technique to investigate the path of the above (a) and (b) redox reactions.

14. Explain the significance of sodium, potassium, magnesium and calcium in biological fluids. [3]

15. Identify the pairs of compounds which are functional group isomers. [3]



16. Write structures of all the alkenes which on hydrogenation give 2-methylbutane. [3]

#### Section D

17. In terms of band theory, what is difference between [5]

- a conductor and an insulator.
- a conductor and a semiconductor.

18. Write balanced chemical equation for the following reactions: [5]

- Permanganate ion ( $MnO_4^-$ ) reacts with sulphur dioxide gas in acidic medium to produce  $Mn^{2+}$  and hydrogen sulphate ion. (Balance by ion electron method)
- Reaction of liquid hydrazine ( $N_2H_4$ ) with chlorate ion ( $ClO_3^-$ ) in basic medium produces nitric oxide gas and chloride ion in gaseous state. (Balance by oxidation number method)
- Dichlorine heptaoxide ( $Cl_2O_7$ ) in gaseous state combines with an aqueous solution of hydrogen peroxide in acidic medium to give chlorite ion ( $ClO_2^-$ ) and oxygen gas. (Balance by ion electron method)

19. i. Name the groups which constitute s-block elements. [5]

- Why cannot sodium and potassium be prepared by the electrolysis of their aqueous solutions?
- Why is the density of potassium less than sodium?
- Why are alkali metals soft and have low melting points?
- What happens when K burns in air? Give the chemical equation.

20. Explain the terms inductive and electromeric effects. Which electron displacement effect explain the following correct orders of acidity of the carboxylic acids? [5]

- $Cl_3 CCOOH > Cl_2 CHOOH > ClCH_2 COOH$
- $CH_3 CH_2 COOH > (CH_3)_2 CHOOH > (CH_3)_3 C \cdot COOH$

21. Assign structures for the following: [5]

- i. An alkyne (X) has a molecular formula  $C_5H_8$ . It reacts neither with sodamide nor with ammoniacal cuprous chloride.
- ii. A hydrocarbon 'Y' decolourises bromine water. On ozonolysis it gives 3-methyl butanal and formaldehyde. Give the name of the compound.
- iii. A hydrocarbon (Z) has molecular formula  $C_8H_{10}$ . It does not decolourise bromine water and is oxidised to benzoic acid on heating with  $K_2Cr_2O_7$ . It can also have three other isomers A, B and C. Write the structures of Z, A, B and C.