

2022-26

Full Marks : 75

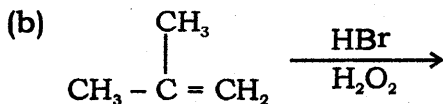
Time : 3 Hours

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

Group-A is compulsory and answer any **four** questions from **Group-B**.

Group - A

1. (a) What is Hybridization of Carbon in CH_4 ?
Write its shape. 5×1=5



- (c) State first Law of Thermodynamics.
(d) Write down the shape of s, p and d atomic orbitals.
(e) CH_3^{\oplus} is a/an

(Electrophile/Nucleophile)

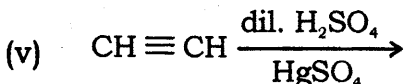
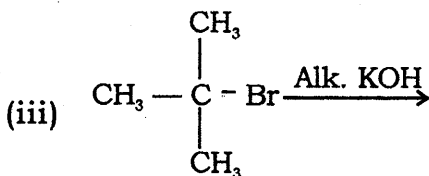
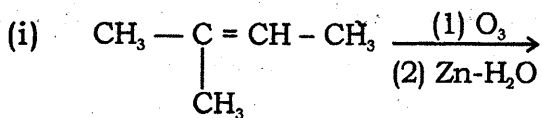
2. What is Resonance ? Discuss it with **two** examples. 2+3=5
3. Discuss Bohr's atomic theory. Write its limitations. 3+2=5

Group - B

4. What is Hybridization ? Predict the shape of following molecules : 5+10=15
- (i) BCl_3
 - (ii) H_2O
 - (iii) NH_3
 - (iv) BeCl_2
 - (v) SF_6
5. What is crystal field theory ? Discuss about crystal field stabilization energy and factors affecting it. 10+5=15
6. Discuss any **three** of the following : 3×5=15
- (i) Aromaticity
 - (ii) Inductive effect
 - (iii) Wurtz Reaction
 - (iv) Stability of Carbonations

7. Describe the different methods for the preparation of Alkenes. Discuss Markownikoff's rule. Predict the products in following reactions :

5+5+5=15



8. Describe any **three** :

5+5+5=15

- (i) Postulates of kinetic theory of gases.
- (ii) Order and Molecularity of reactions.
- (iii) Half life of a reaction.
- (iv) Laws of thermodynamics.
- (v) Deviation of Real gase's from ideal behaviour.

9. Write short note on any **three** : $3 \times 5 = 15$.

- (i) VSEPR Theory.
- (ii) Periodicity of atomic and Ionic size of P - Block elements.
- (iii) Nitration and Sulfonation in Benzene.
- (iv) Friedel Craft Reactions.
- (v) Le - Chatelier's principle.
