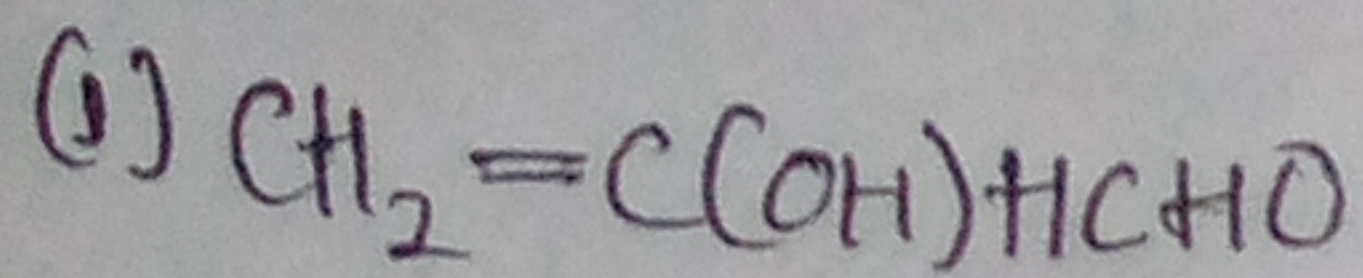


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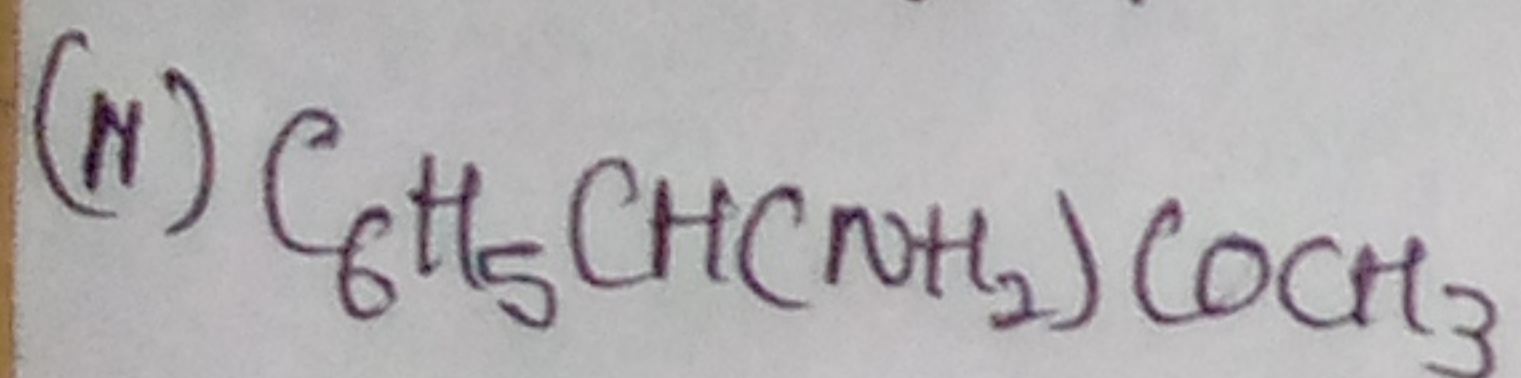
Assignment

① Name the functional groups present in each of the following molecules



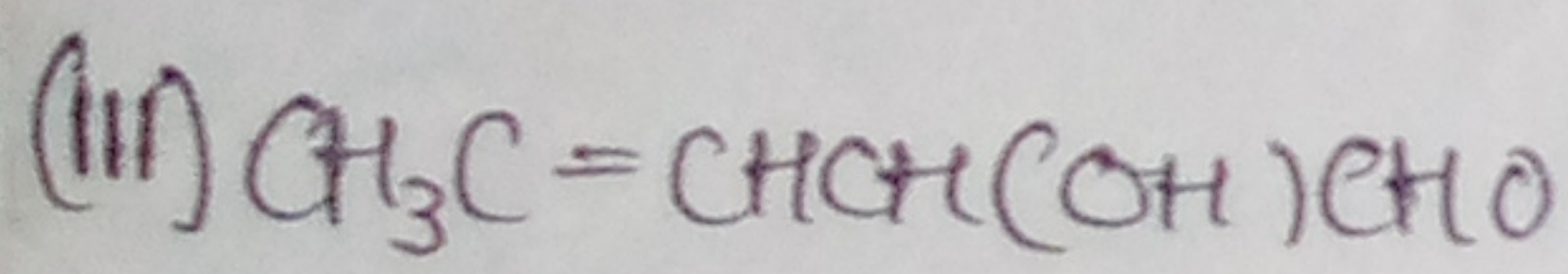
Soln

- (a) Formyl group (Aldehyde) group (CHO)
- (b) Hydroxyl group (OH)
- (c) Alkene group (Double bond) Ans



Soln

- (a) Keto group (Carbonyl group)  $\text{C}=\text{O}$
- (b) Amino group ( $\text{NH}_2$ )
- (c) Aromatic group (Phenyl group) Ans



Soln

- (a) Aldehyde group
- (b) Hydroxyl group
- (c) Double bond (Alkene group) Ans

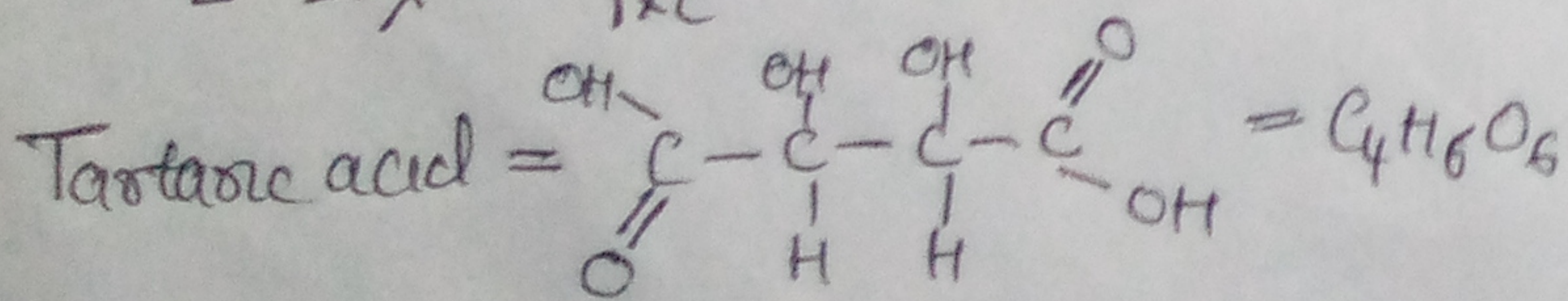
② A 0.856g sample of pure (2R,3R)-tartaric acid was diluted to  $10\text{cm}^3$  with water and placed in a  $1.0\text{dm}^3$  polarimeter tube. The observed rotation at  $20^\circ\text{C}$  was  $+1.0^\circ$ . Calculate the specific rotation of (2R,3R)-tartaric acid.

Soln

$$\text{Concentration (mol dm}^{-3}\text{)} = \frac{\text{Conc. (g/dm}^3\text{)}}{\text{molar mass (g/mol)}}$$

Recall;

$$[\alpha]_{\lambda}^T = \frac{\alpha}{l \times c}$$



Molar mass =  $150\text{g/mol}$

$$0.856\text{g} \text{ --- } 10\text{cm}^3$$

$$x\text{g} \text{ --- } 100\text{cm}^3$$

$$\frac{0.856 \times 1000}{10} = 85.6\text{g/dm}^3$$

$$\text{Concentration in g/cm}^3 = \frac{\text{Concentration (g/dm}^3\text{)}}{1000}$$

$$= \frac{85.6}{1000} = 0.0856\text{g/cm}^3$$

$$[\alpha]_{\lambda}^T = \frac{\alpha}{c \cdot l} = \frac{+1.0}{0.0856 \times 1} = 11.68^\circ \text{ Ans}$$

OR

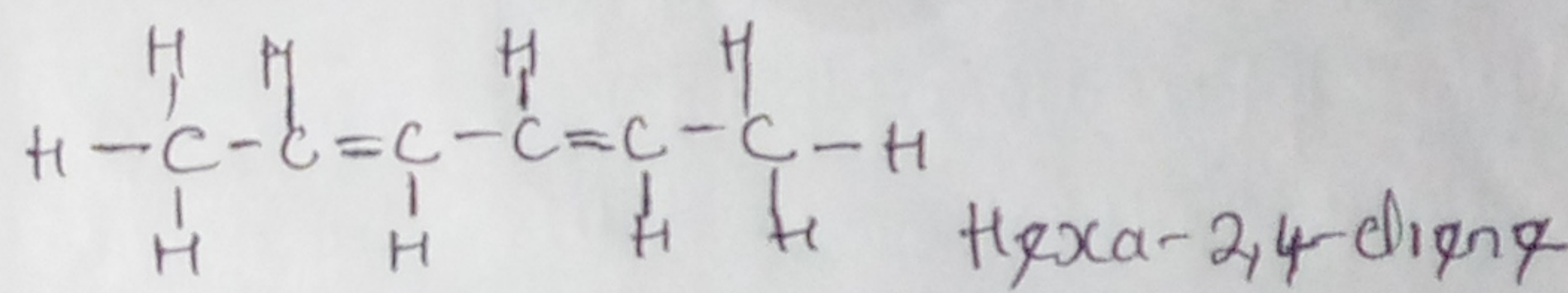
$$[\alpha]_D^{20} = \frac{\alpha}{c \cdot l}; \alpha = +1.0^\circ, c = \frac{0.856}{10} = 0.0856\text{g/cm}^3$$

$$= \frac{+1.0}{0.0856} = 11.68^\circ \text{ Ans}$$

③ Draw the possible geometric isomers (where possible) for each of the following compounds

(i) Hexa-2,4-diene

Soln

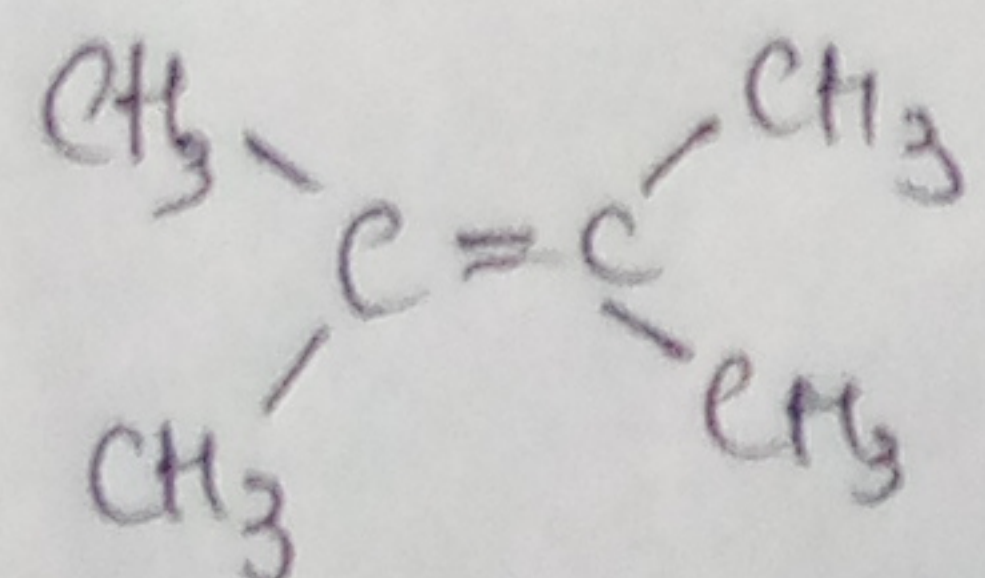
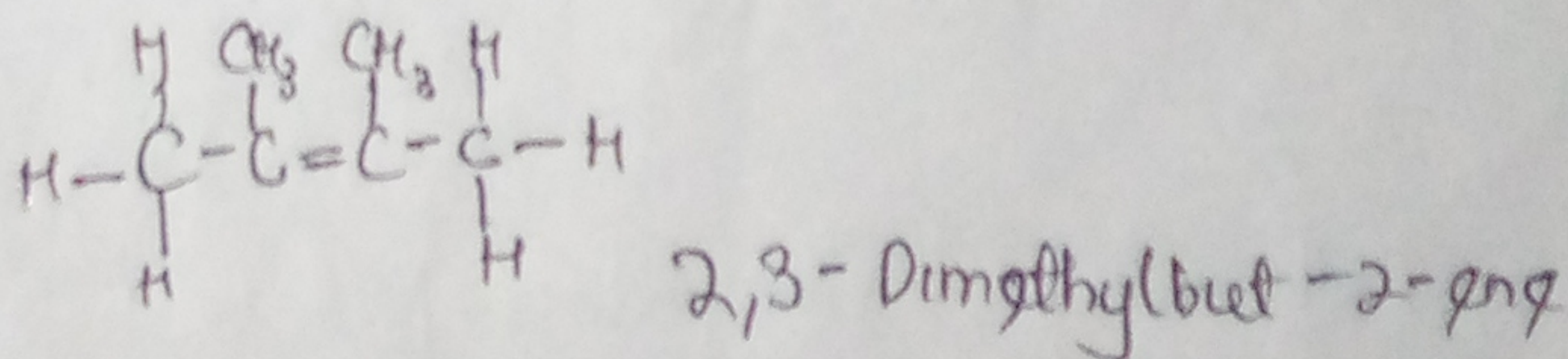


Cis- Ans

Trans- Ans

(ii) Dimethylbut-2-ene (2,3-Dimethylbut-2-ene)

Soln



No geometric isomers Ans