

Answer five questions, selecting at least one from each Group, in which Q.No. 1 is compulsory.

1. Answer all the questions :

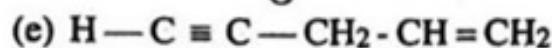
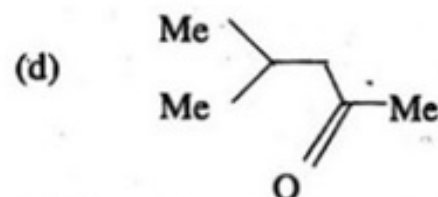
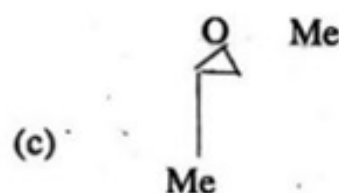
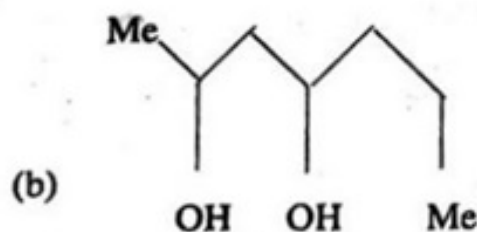
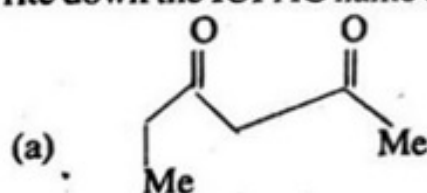
- Ice floats on water. Explain.
- Establish the relationship between rms velocity and most probable velocity of a gas.
- Define critical pressure in terms of van der Waal's constants.
- Aldehyde is more reactive than ketone towards nucleophile.
- What happens when acetamide is treated with bromine in the presence of alkali at 0° ?

Group-A

- Calculate rms velocity of one mole of hydrogen gas at 27°C .
 - Derive reduced equation of state for real gas.
 - Define collision number and mean free path.
- Discuss the differences between liquid crystal, solid and liquid.
 - If the radius of one gas molecule is 0.3 \AA , calculate the van der Waal's constant b .
 - Discuss the pressure and volume corrections made by van der Waal.
- Discuss Maxwell's distribution of molecular velocities.
 - Write short notes on Joule-Thomson effect.

Group-B

- How will you bring about the following transformations :
 (a) Ethanol to butanone, (b) Ethanol to methanol, (c) Methanol to t-butanol, (d) Urea to barbituric acid, (e) Acetone to glycerol.
- Write down the IUPAC name of the following :



7. What happens when :

- Calcium formate is dry distilled
- Acetaldehyde reacts with phenyl hydrazine
- Two moles of acetone condense with conc. alkali.
- Formaldehyde is treated with conc. NaOH
- Glycerol is treated with periodic acid

8. Write short notes on any two of the following :

(a) Inductive effect

(b) Hyper conjugation

(c) SN_1 and SN_2 reaction

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