

2018

2nd Semester

CHEMISTRY

PAPER—C4

(Honours)

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

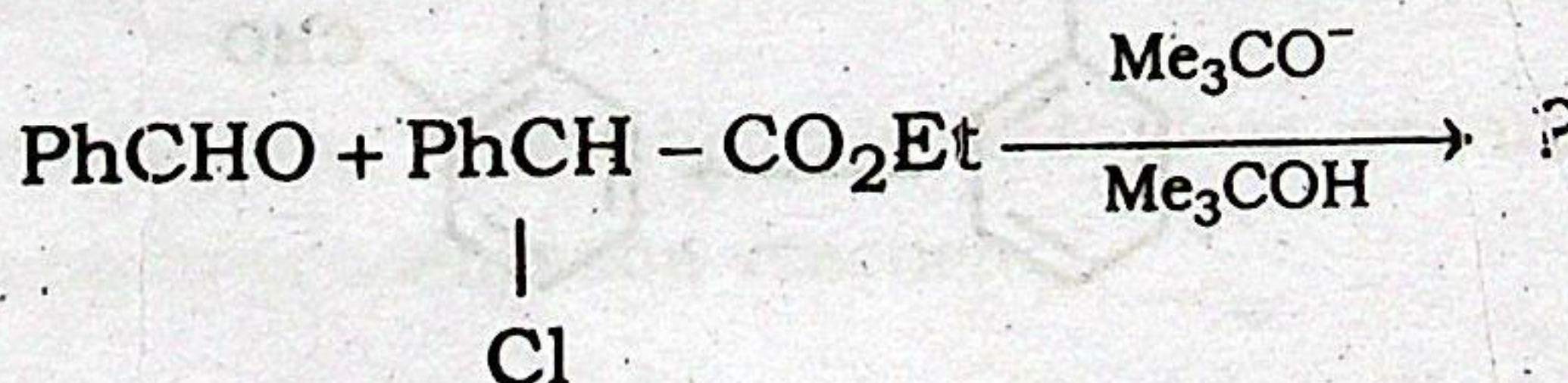
Illustrate the answers wherever necessary.

Organic Chemistry II

1. Answer any five questions :

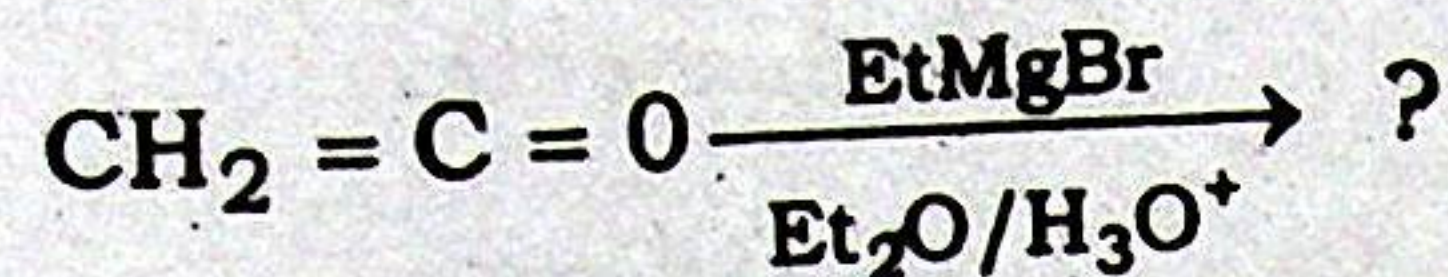
5×1

(a) Predict the major product

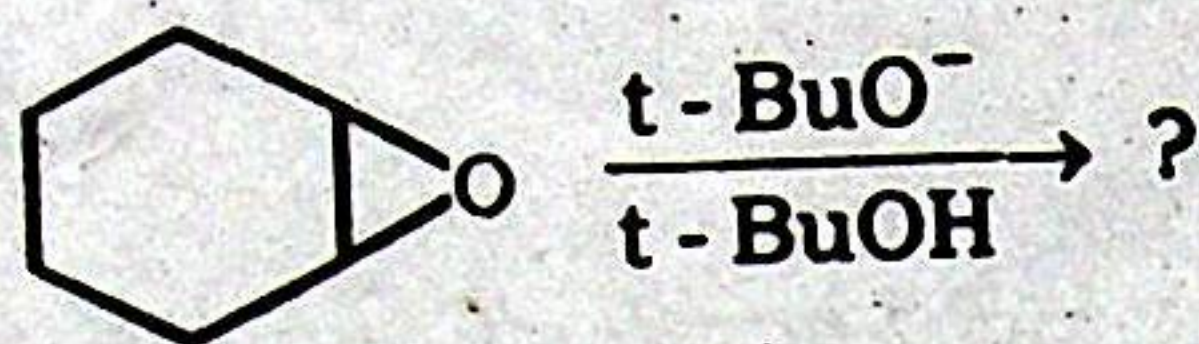


(Turn Over)

(b) Complete the following reaction :



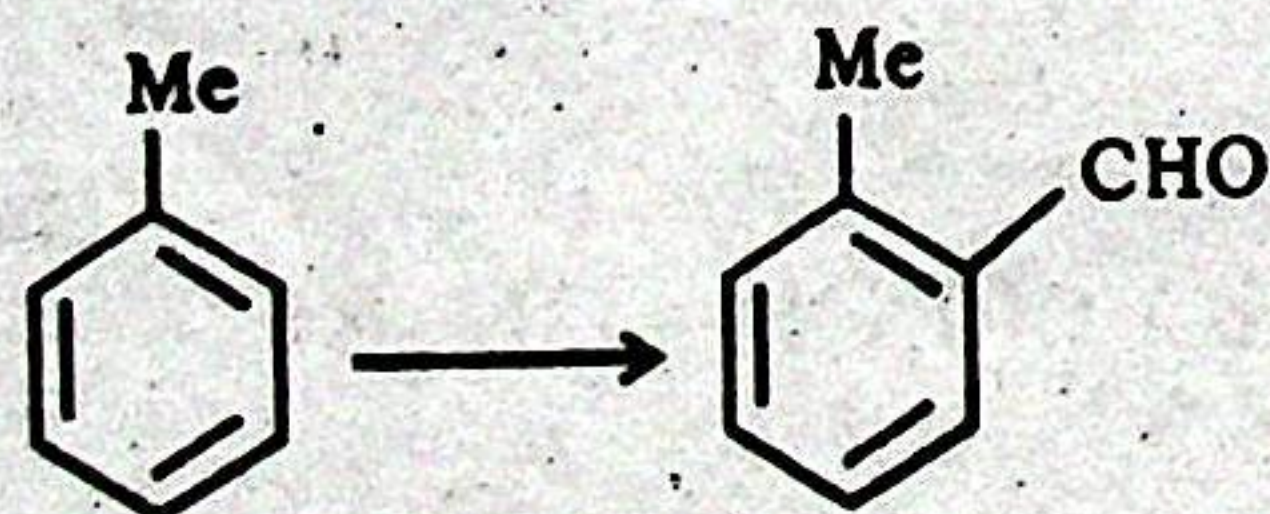
(c) Write down the product of this reaction :



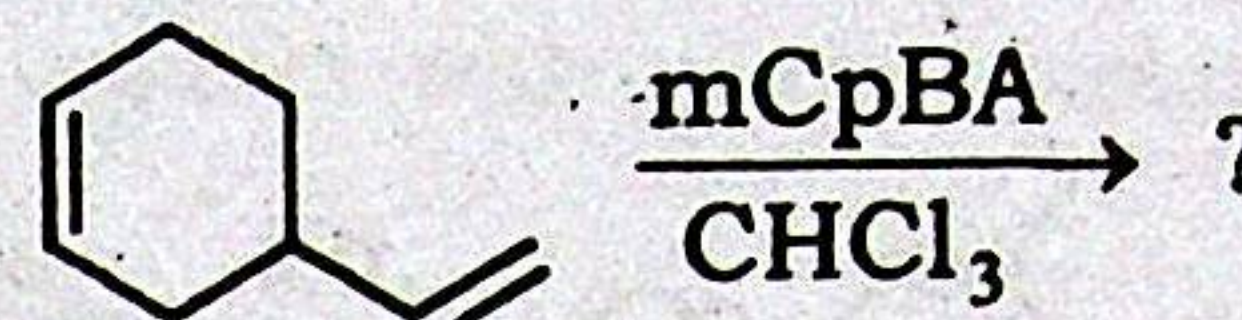
(d) In Reformatsky reaction, α -haloester in presence of metallic zinc, first form a zinc-enolate. Write down the structure of this zinc-enolate.

(e) Draw the stable conformation of 1-methyl-1-phenylcyclohexane.

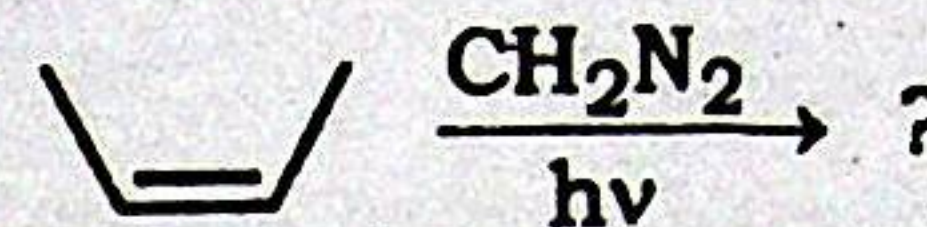
(f) How would you convert :



(g) Predict the product :



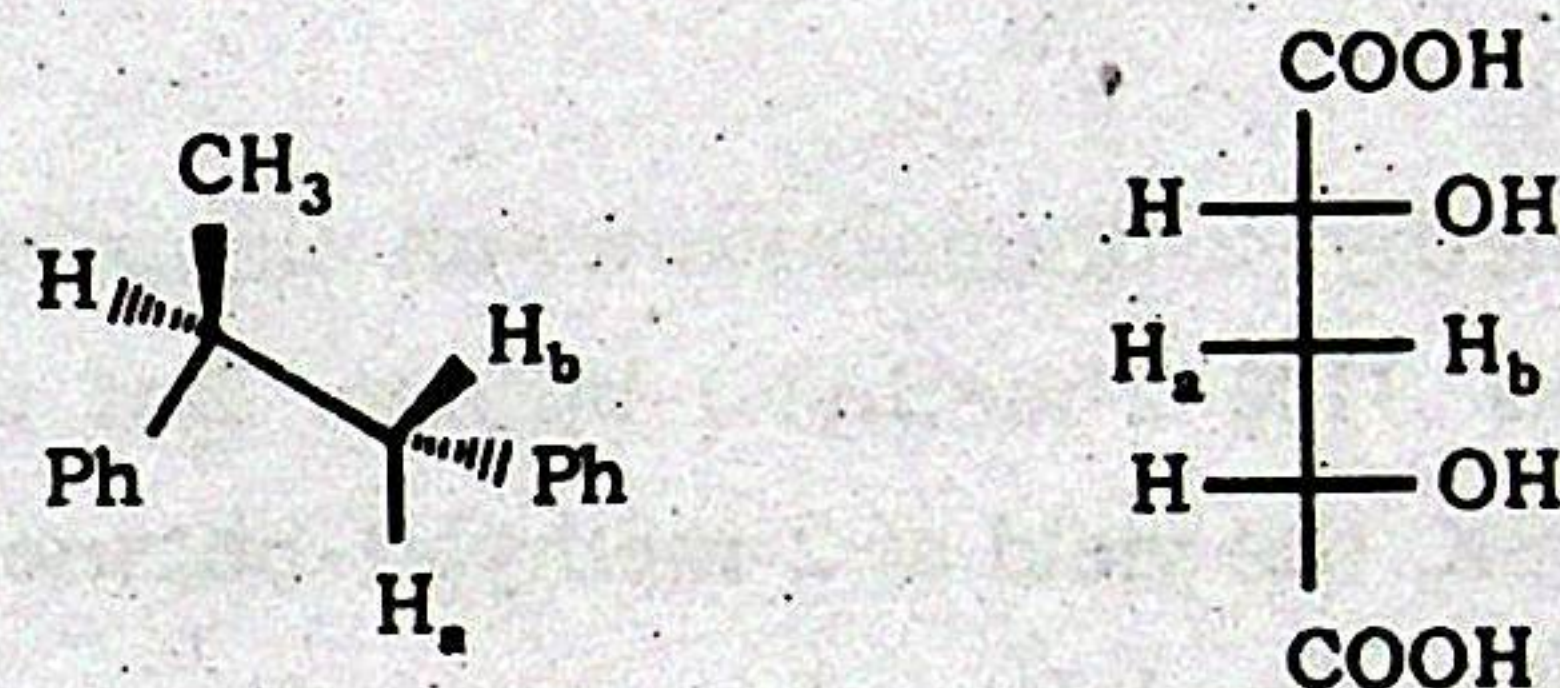
(h) Predict the product :



2. Answer any five questions :

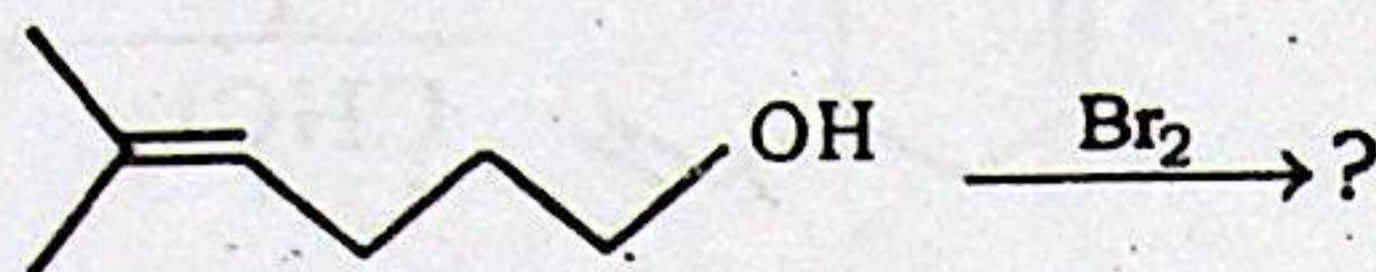
5x2

(a) Identify Pro-R and Pro-S hydrogen atom in each of the following compound :



(b) Explain why p-nitrobenzaldehyde does not undergo Benzoin-condensation reaction.

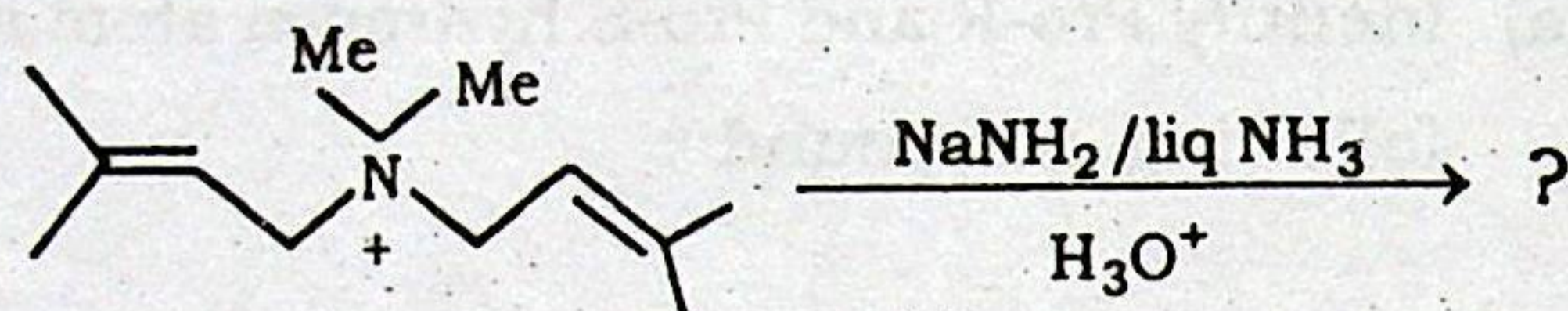
- (c) Propose the product with mechanism of the following reaction :



- (d) Differentiate between configuration and conformation.

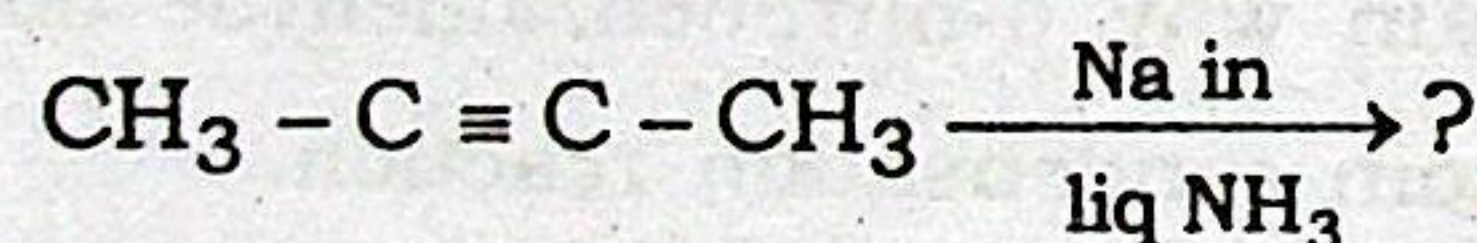
- (e) 1, 3-dithiane, is stable in acid, but in presence of HgCl_2 it gets hydrolysed — explain.

- (f) Suggest the product :



- (g) 2-methyl-2-bromobutane, on elimination with NaOEt gives 31% 2-methyl-1-butene. But in presence of $t\text{-BuOK}$, the yield of 2-methyl-1-butene increases up to 73% — explain.

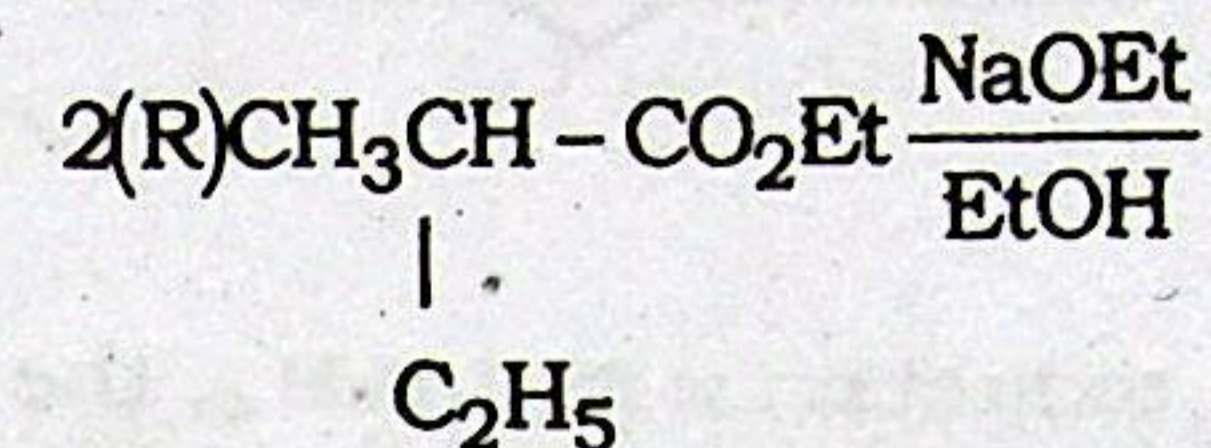
- (h) Suggest the product :



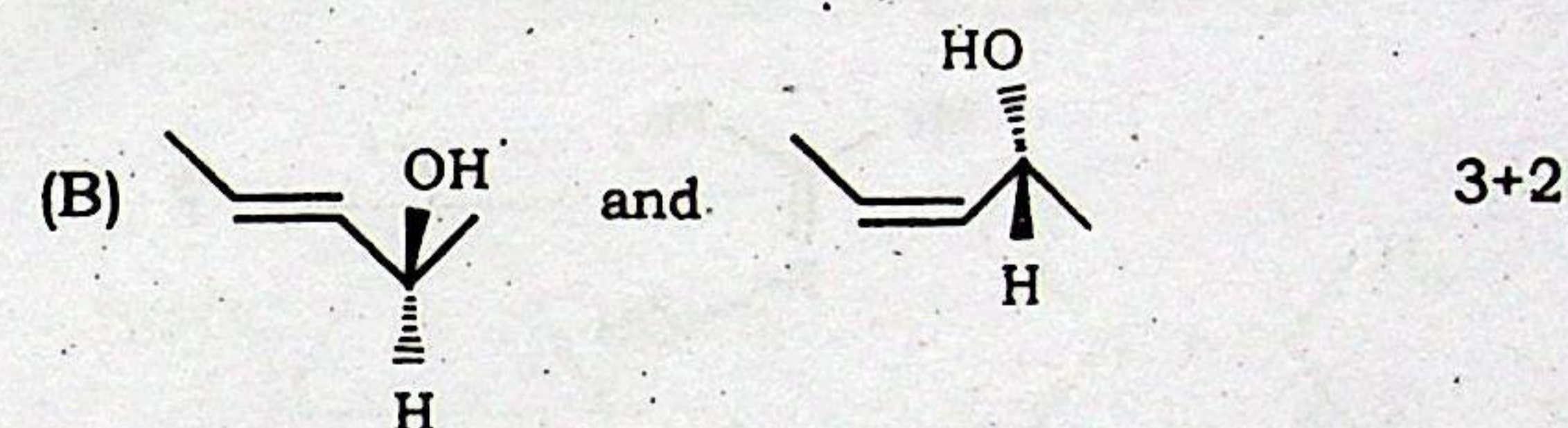
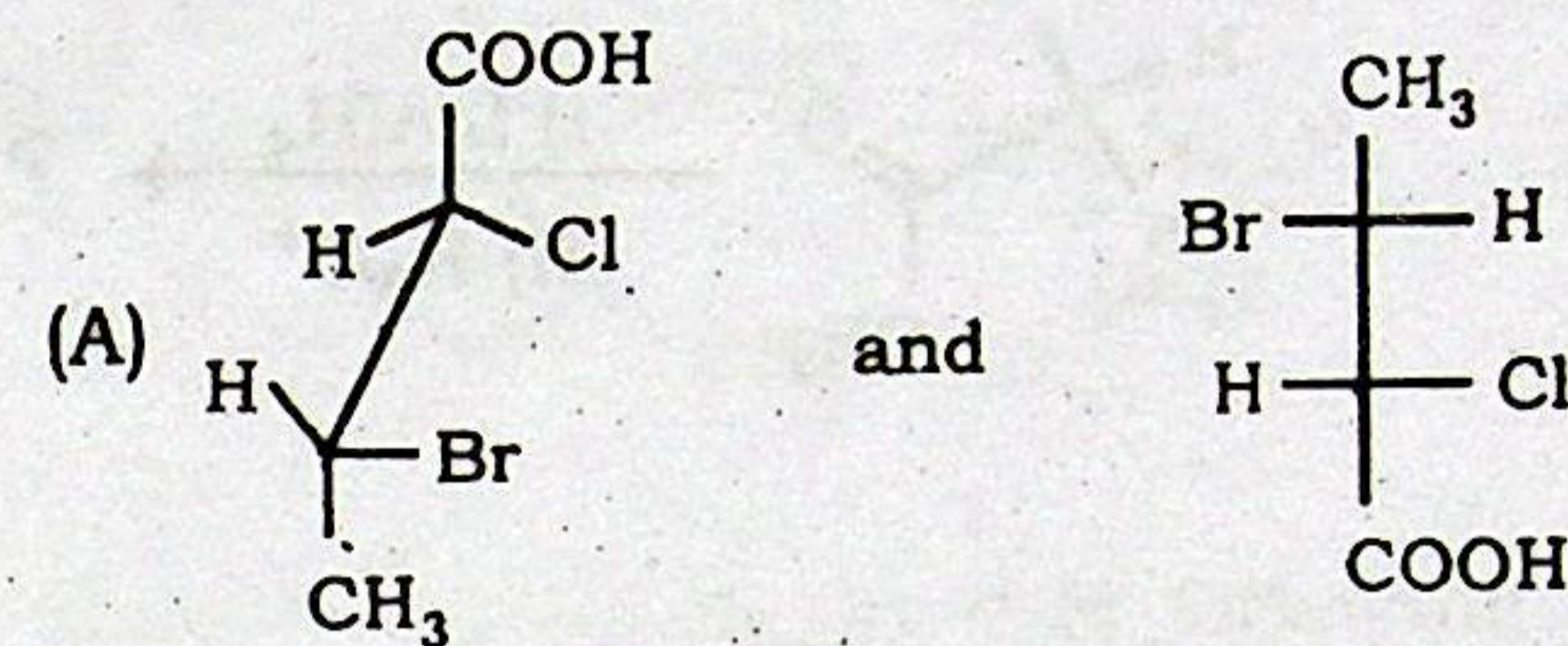
3. Answer any *three* questions. :

3×5

- (a) (i) Find the product with proper explanation :



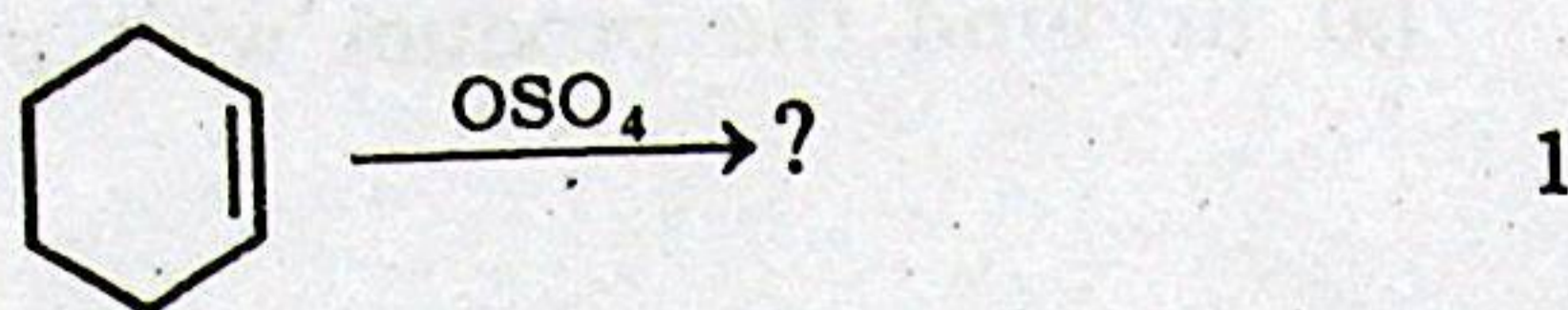
- (ii) Label the following pair as Homomers, enantiomer or diastereomer :



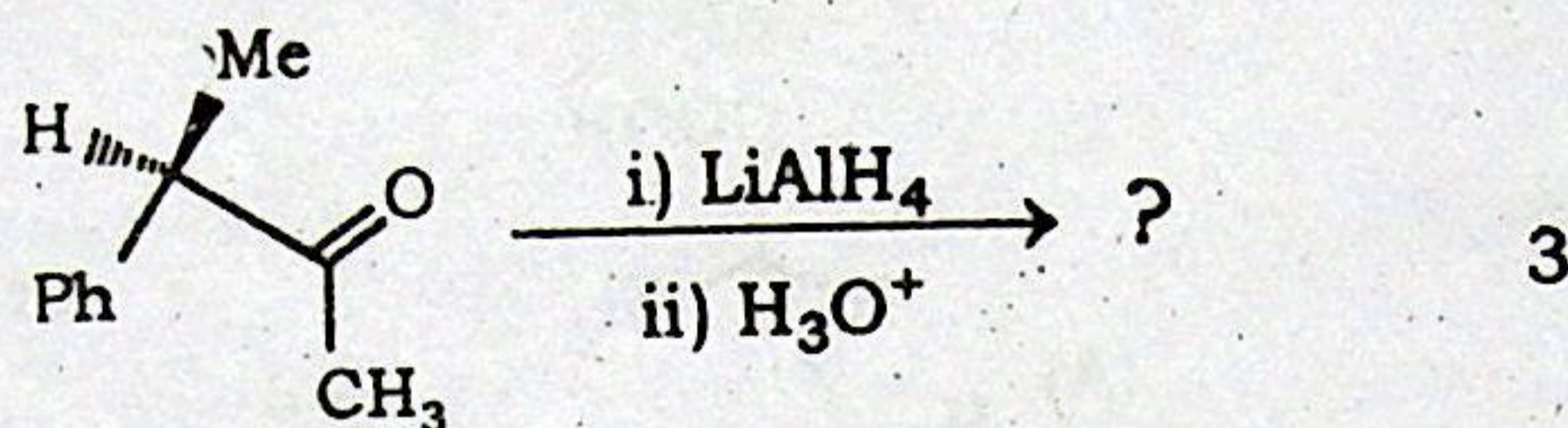
- (b) (i) What kind of stereoelectronic requirement is required for E_2 elimination? 1

- (ii) Suggest the major product, when 2-bromopentane is treated with KOEt . Justify your choice. 1+2

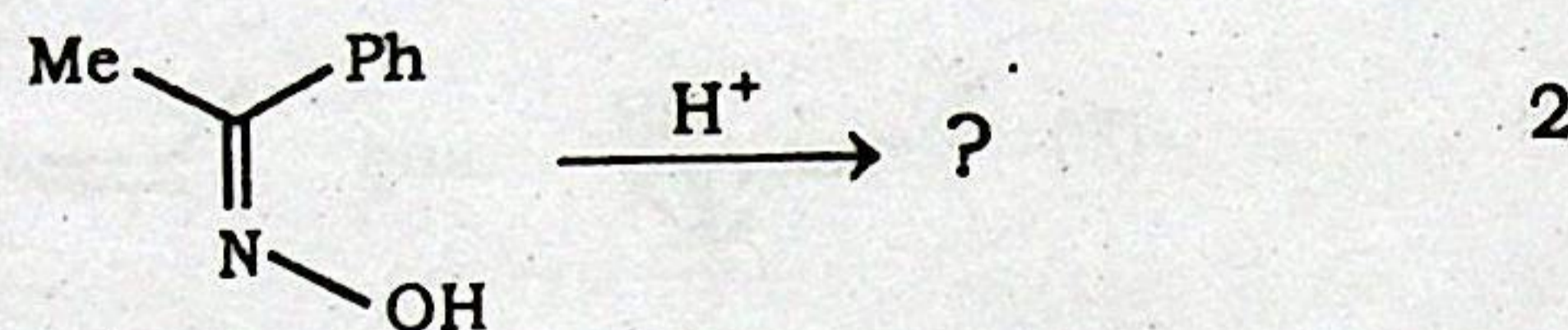
(iii) Write down the product with stereochemistry :



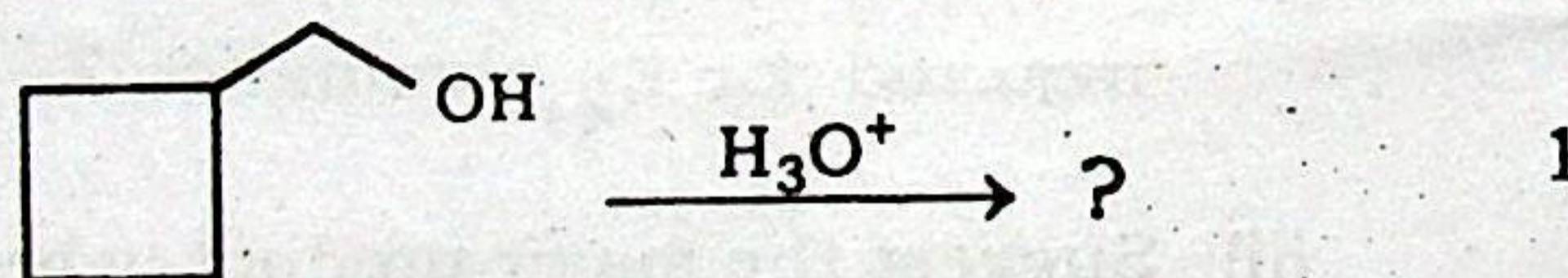
(c) (i) On reduction with LiAlH_4 , the following compound gives two diastereomers. Explain the product by Cram's rule.



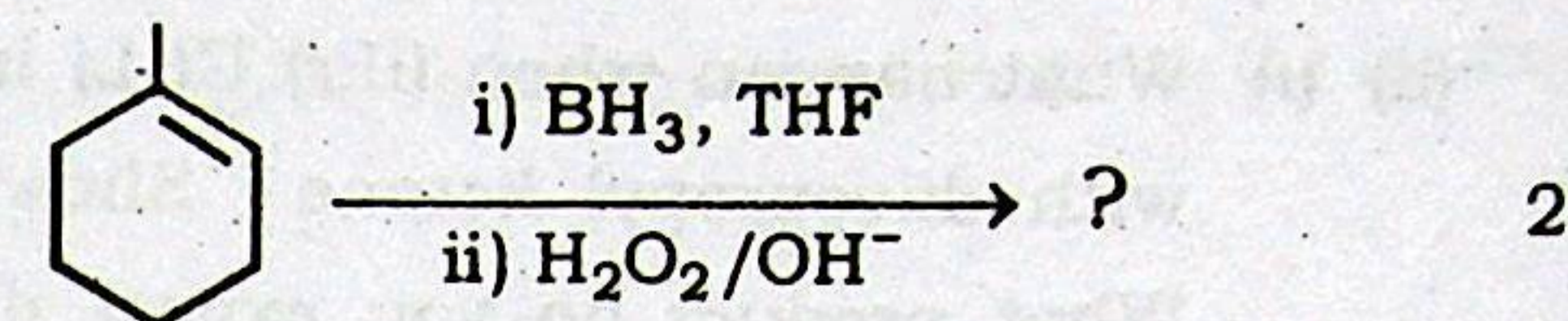
(ii) Complete the reaction



(d) (i) Find the product :

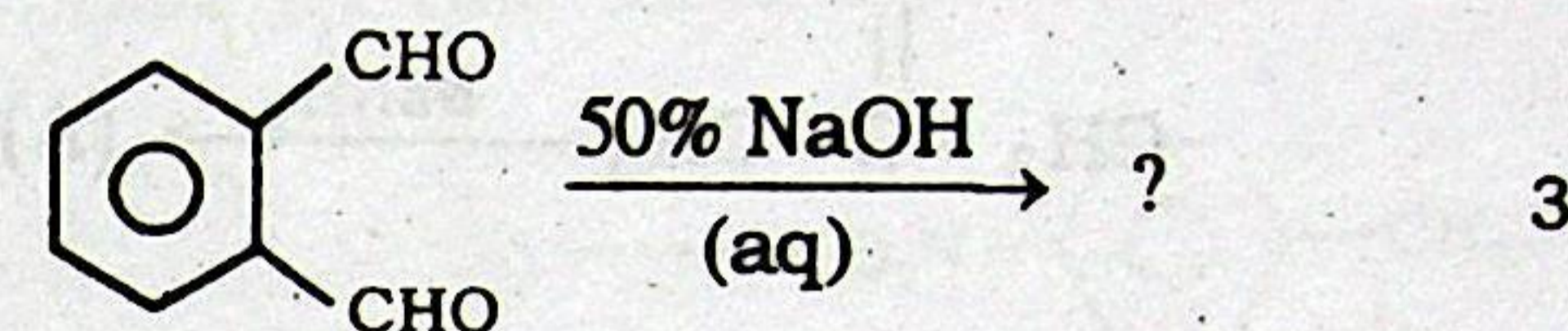


(ii) Show the product with mechanism

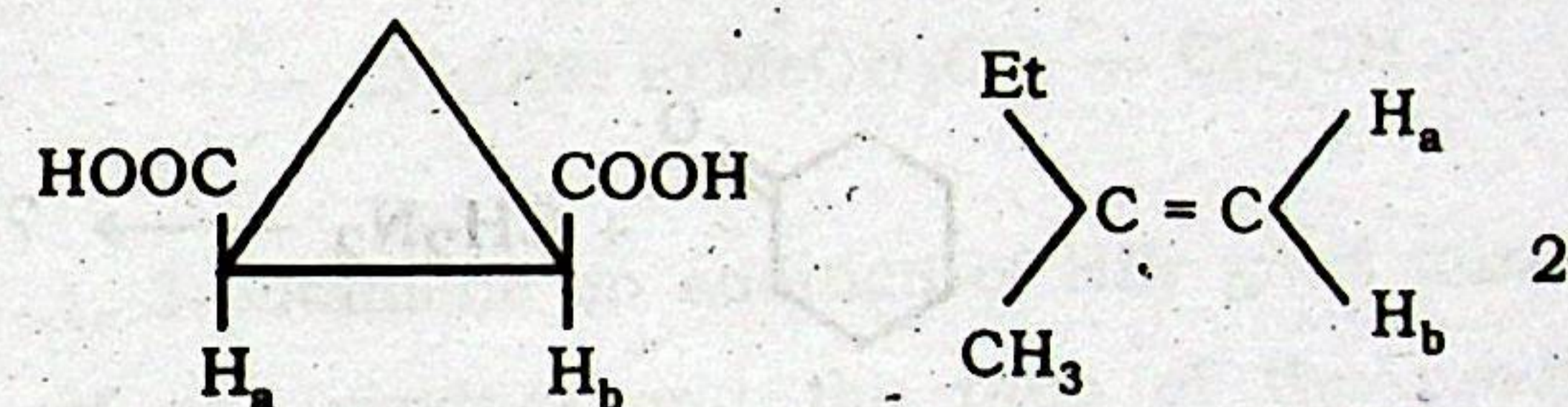


(iii) Convert cis-1, 2-dimethylcyclohexane chair to Newman Projection. 2

(e) (i) Predict the product with mechanism



(ii) Identify H_a or H_b in this following structure as homotopic, enantiotopic or diastereotopic :

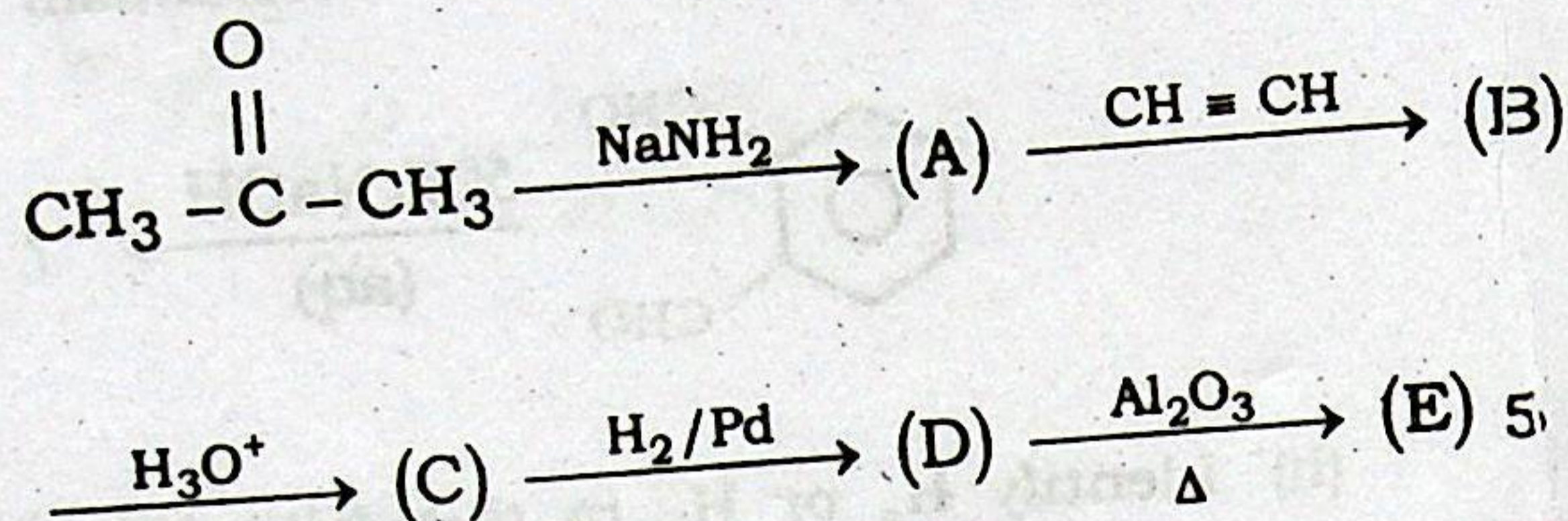


4. Answer any one question :

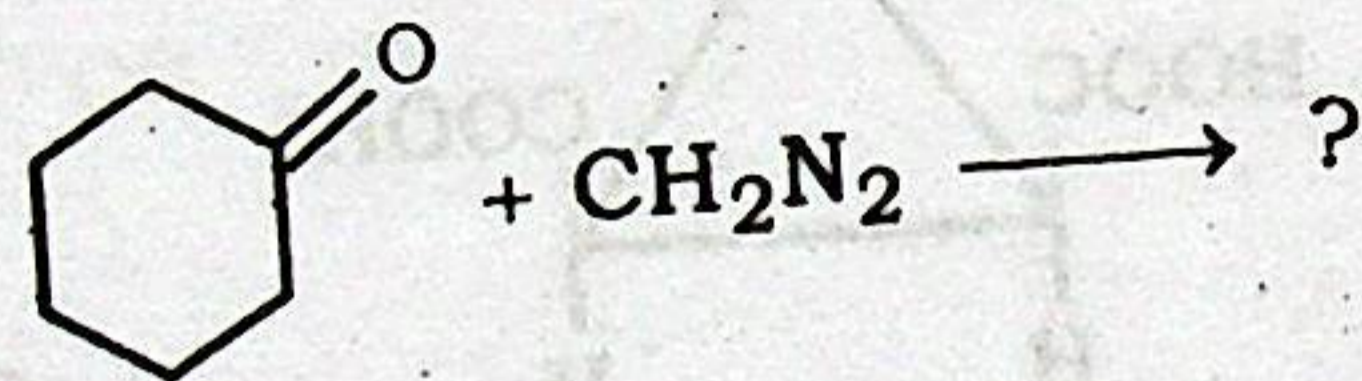
1×10

(a) (i) What happens when (iPr) CHLi is allowed to react with diisopropyl ketone? Show the mechanism. What product do you expect if (iPr) CHMgBr is allowed to react with diisopropyl ketone. 3

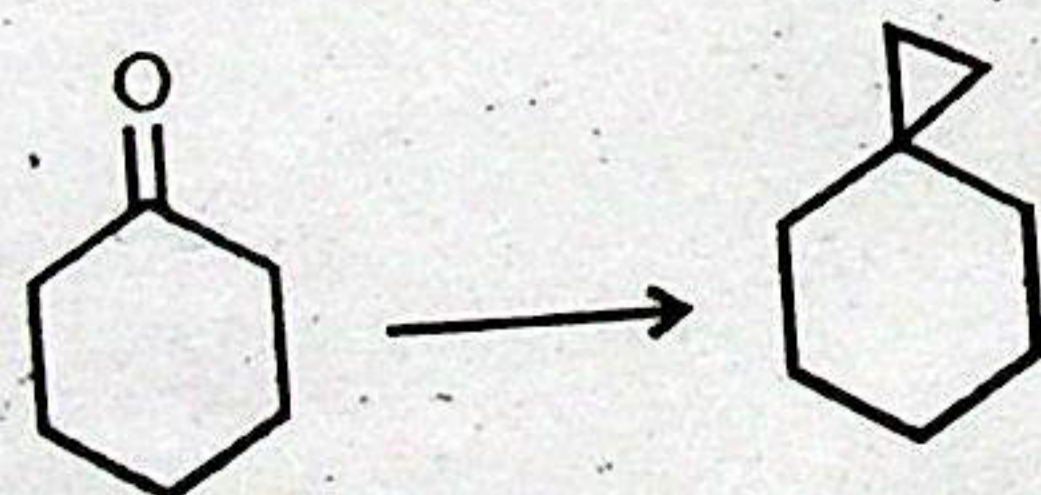
(ii) Identify A - E :



(iii) Write the product



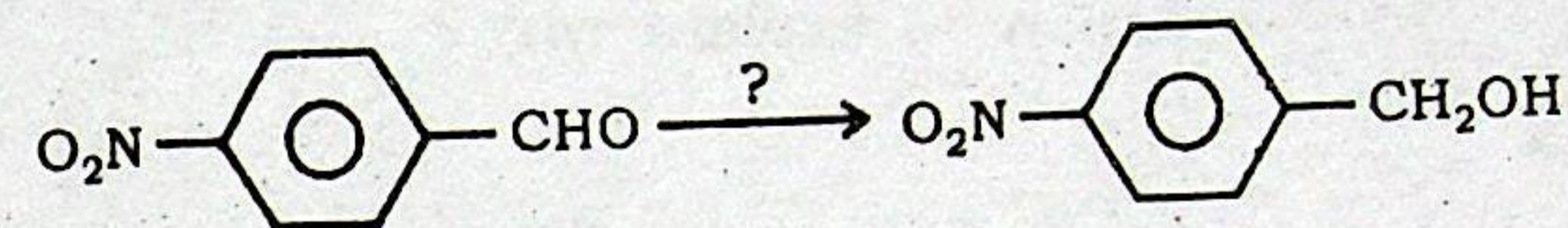
(iv) How will you convert ?



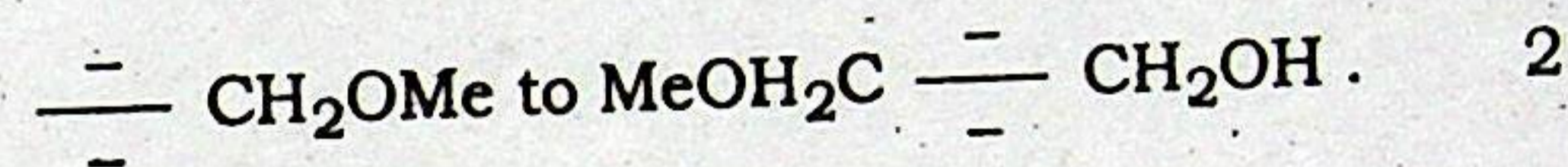
(b) (i) Threo-1, 2-dibromo-1, 2-diphenyl ethane, in presence of pyridine gives (Z)-1-bromo-1, 2-diphenyl ethylene, whereas erythro isomer gives (E) isomer. Explain. 4

(ii) Explain why cyanide ion (CN⁻) is considered as best catalyst for Benzoin condensation reaction? 2

(iii) Which reducing agent (LiAlH₄, B₂H₆, NaBH₄) will be suitable for this transformation? 2

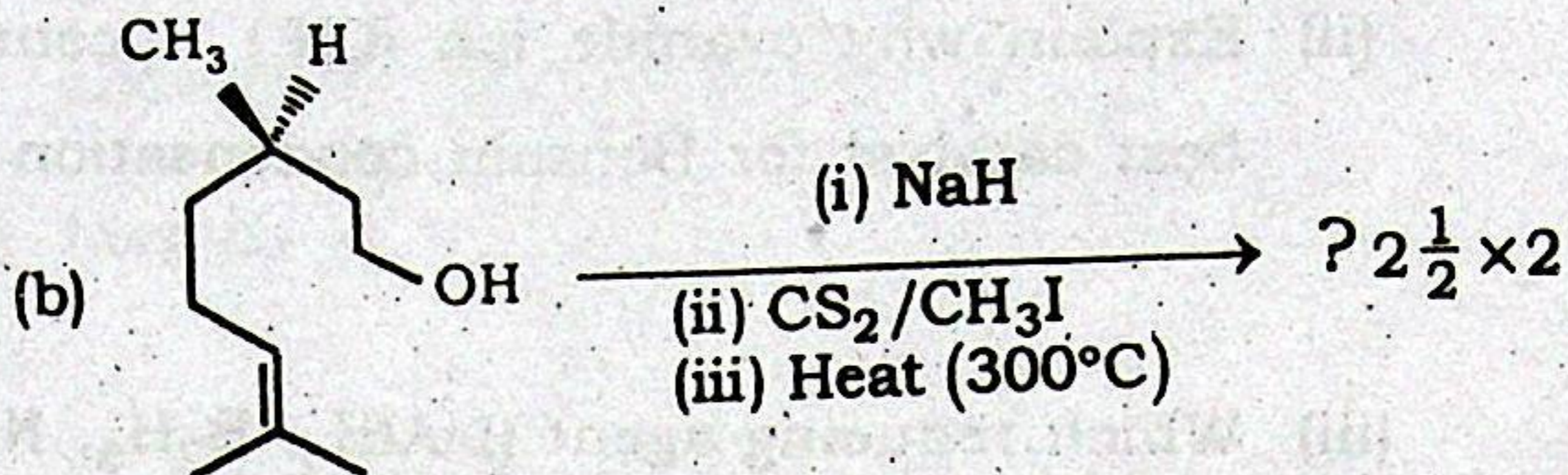
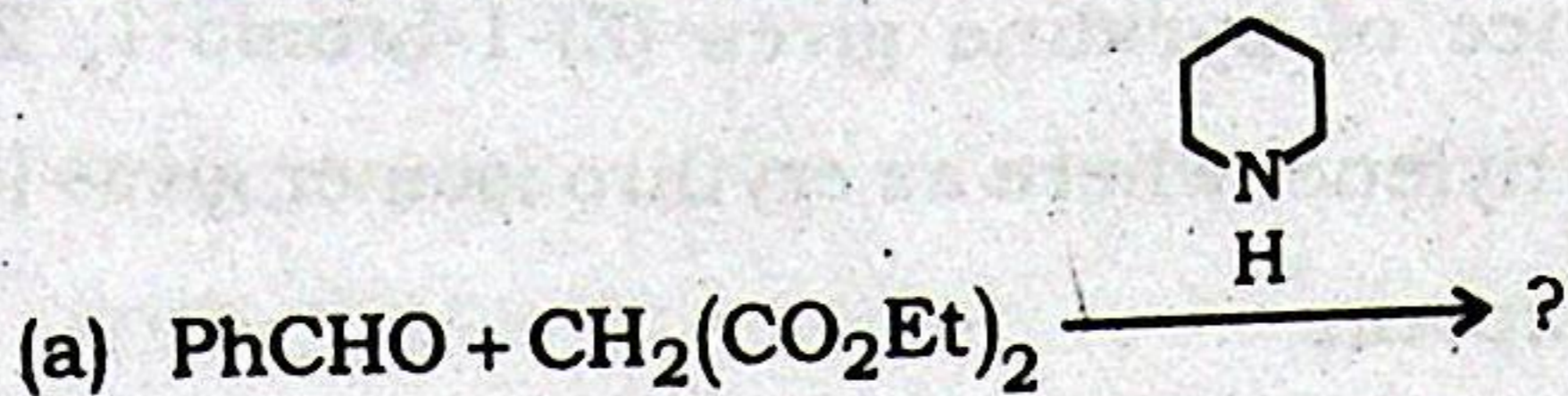


(iv) Convert



(c) (i) 1, 3-butadiene on addition of HBr gives mixture of two products and the ratio of the products depends on reaction temperature. Mention the product and explain the fact. 3

(ii) Predict the product and suggest the mechanism.



(iii) NaOEt on NaOH is not suitable base for Perkin reaction — explain why? 2