

Specification of configuration of Geometrical isomers \rightarrow

To specify configurations of geometrical isomers by Cahn-Ingold-Prelog method following procedures are adopted —

1. The structural formula of the molecule is drawn on the plane of paper clearly showing the double bond or the ring with their substituents attached to the involved atoms of the rigid part.
- ② Priority of the substituents on each of the involved atom is determined.

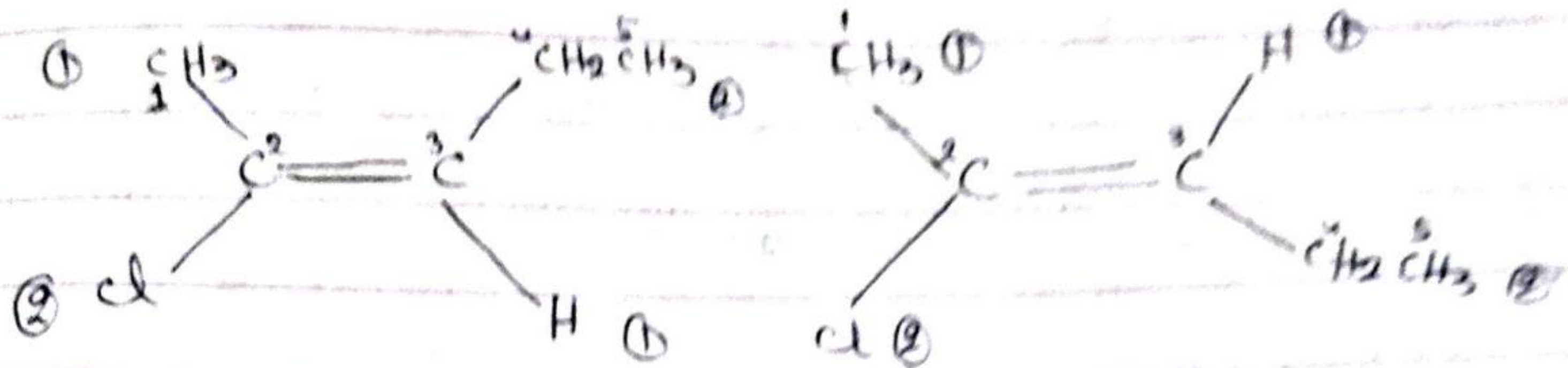
③ If the higher priority substituents are found on the same side of the double bond or the ring the configuration of the molecule is said to be Z.

(Z is the first letter of the German word Zusammen meaning together)

on the other hand if higher priority of the substituents are placed on the opposite side of the double bond or ^{the} ring the configo of the molecule is said to be E.

(E is the first letter of the German word entgegen meaning opposite)

Example \rightarrow 2-chloro-2-pentene



(E) 2-chloro-2-pentene

Form I

(Z) 2-chloro-2-pentene

Form II

Symbol $\text{\textcircled{1}}$ indicates lower priority of the substituents.

$\text{\textcircled{2}}$ indicates higher priority of the substituents.

Here $\text{\textcircled{1}} = \text{CH}_3$ and H

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$\text{\textcircled{2}} = \text{Cl}$ and CH_2CH_3 .

Thus we see that higher priority substituents are on opposite sides of the $\text{C}=\text{C}$ bond in form I. Hence its configuration is specified by (E). But in the form II both the higher priority substituents are on the same side of $\text{C}=\text{C}$ bond hence the form II is specified by (Z).

Nomenclature of the geometrical isomers: \rightarrow

For naming the geometrical isomers E or Z prefixed within IUPAC name of the compound.

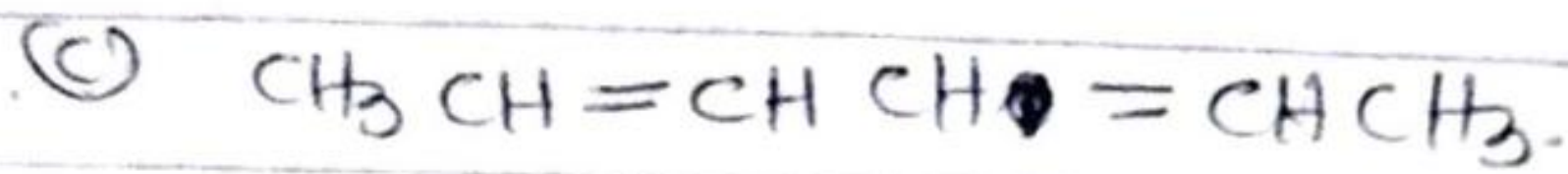
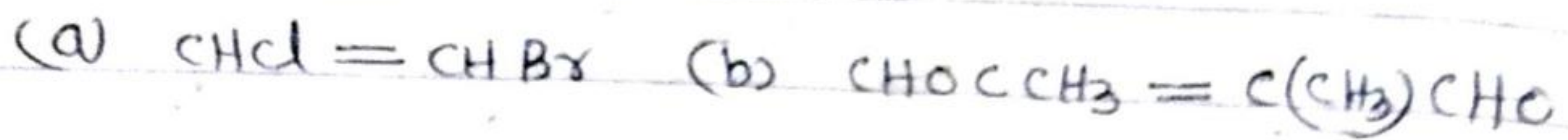
For example \rightarrow .

Name of the above compd: for form I

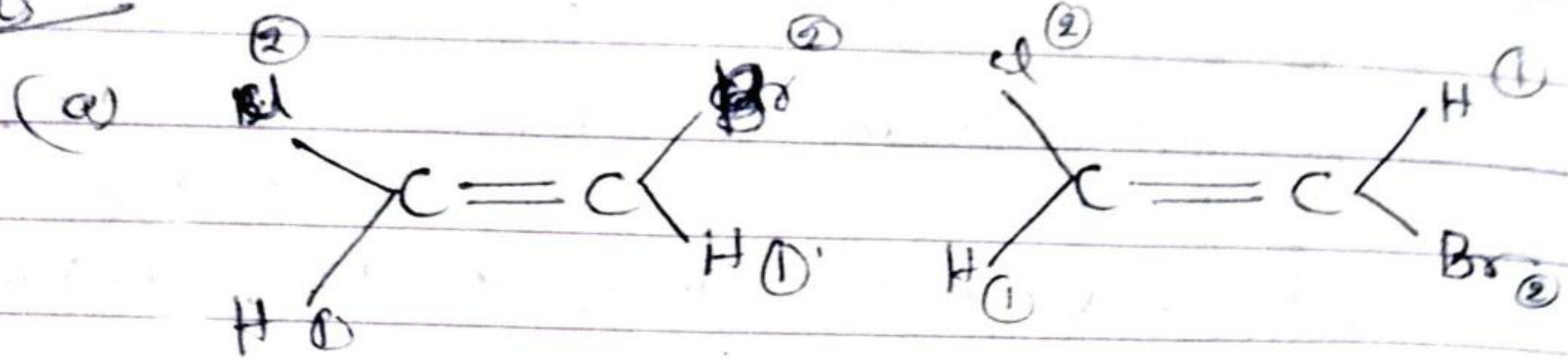
and form II is E-2-chloro-2-pentene and

Z-2-chloro-2-pentene correspondingly.

Ques. Name the following geometrical isomers;

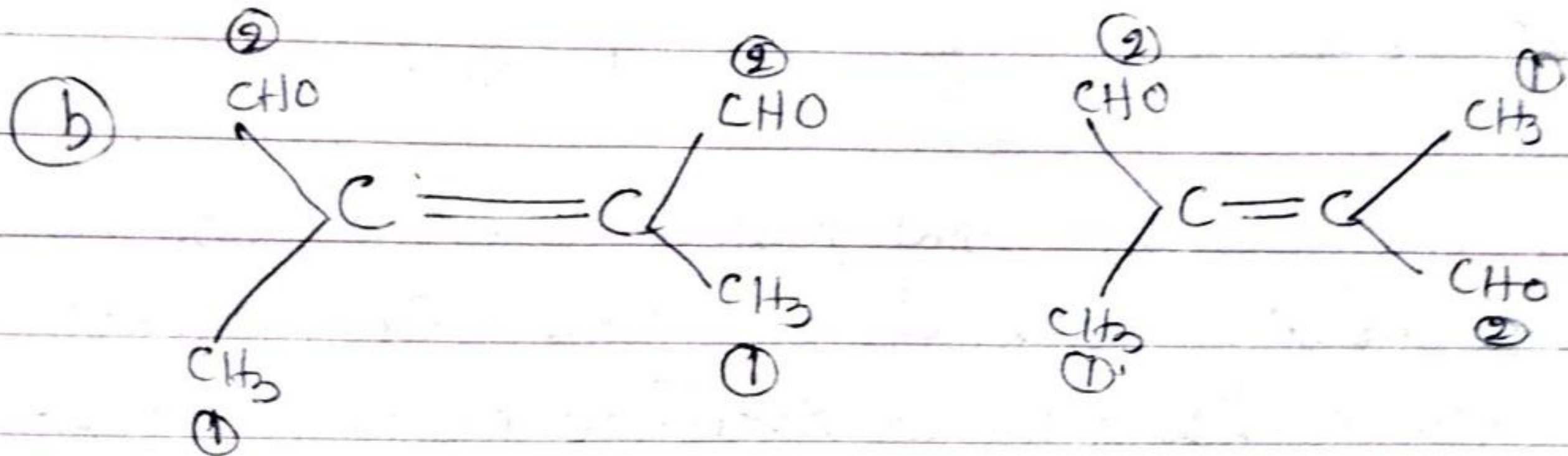


Ans



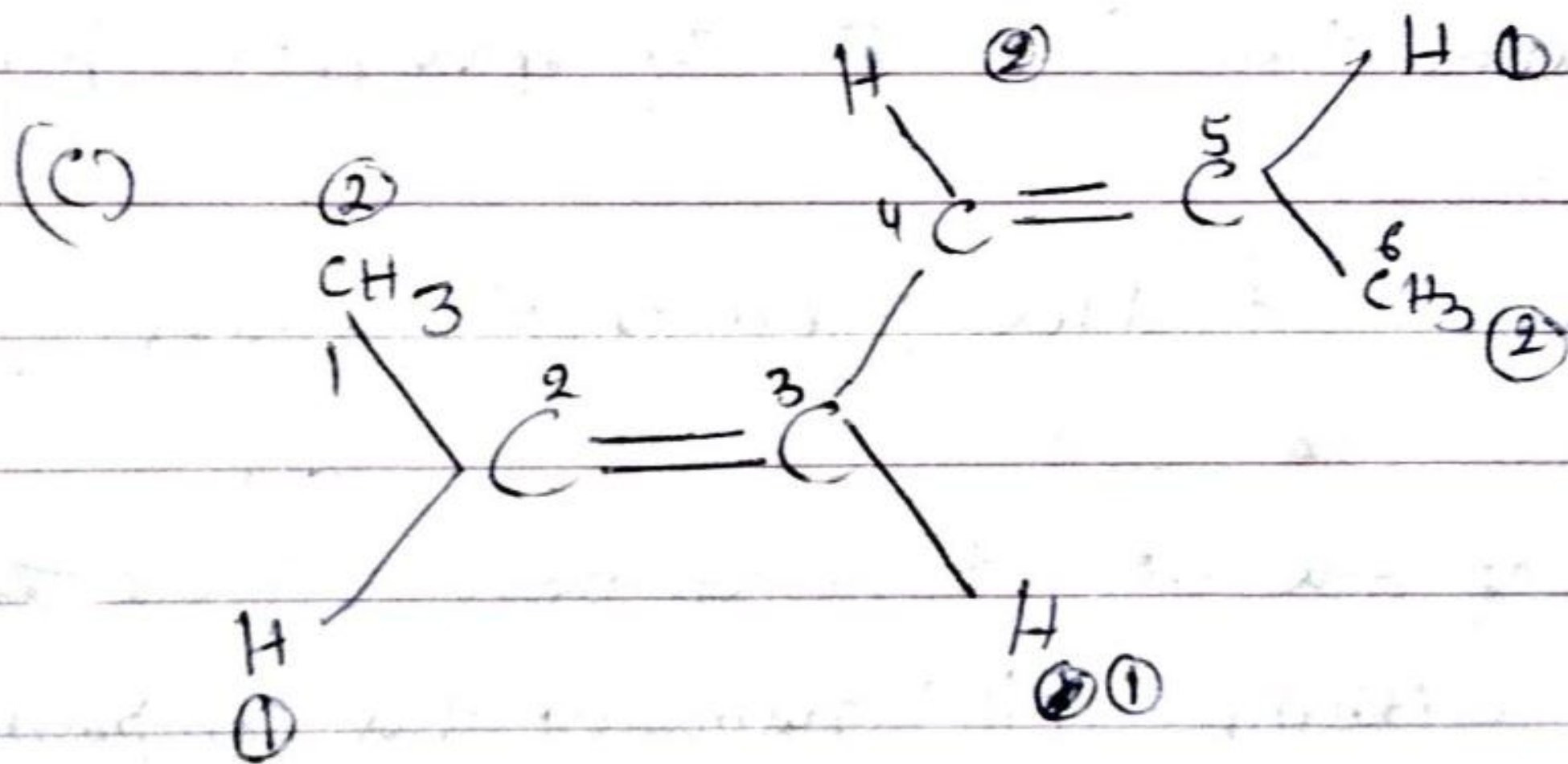
cis or (Z) - 1-bromo
- 2-chloro
ethene

trans or (E) - 1-bromo
- 2-chloroethene

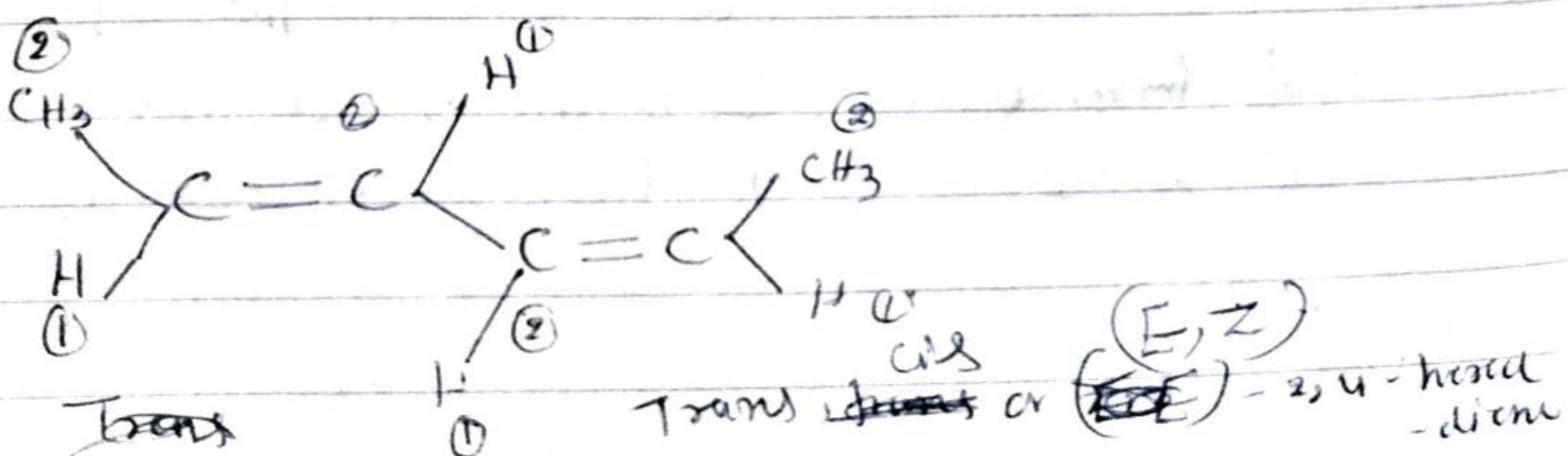


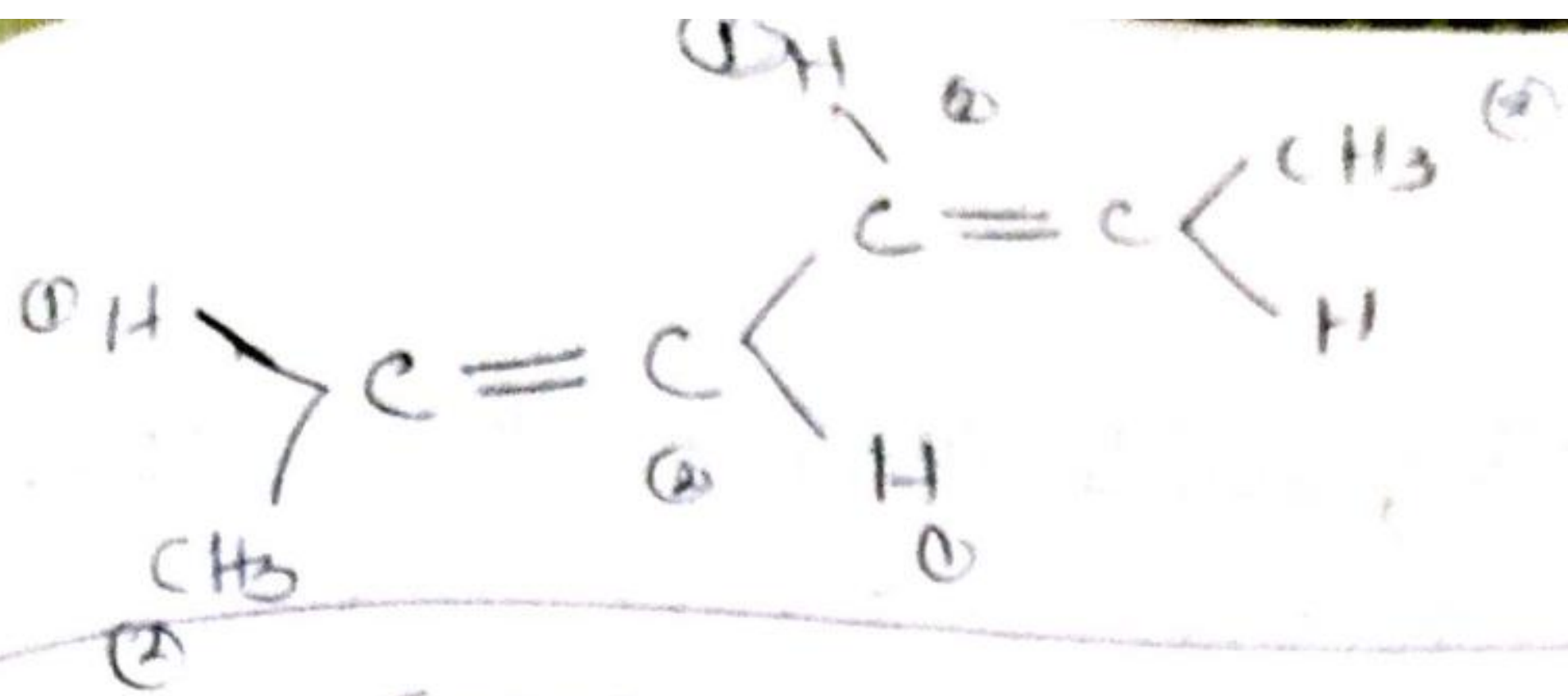
cis or (Z) - 2,3-dimethyl-
-butene-dial

trans or (E) - 2,3-dimethyl-
-butene-dial

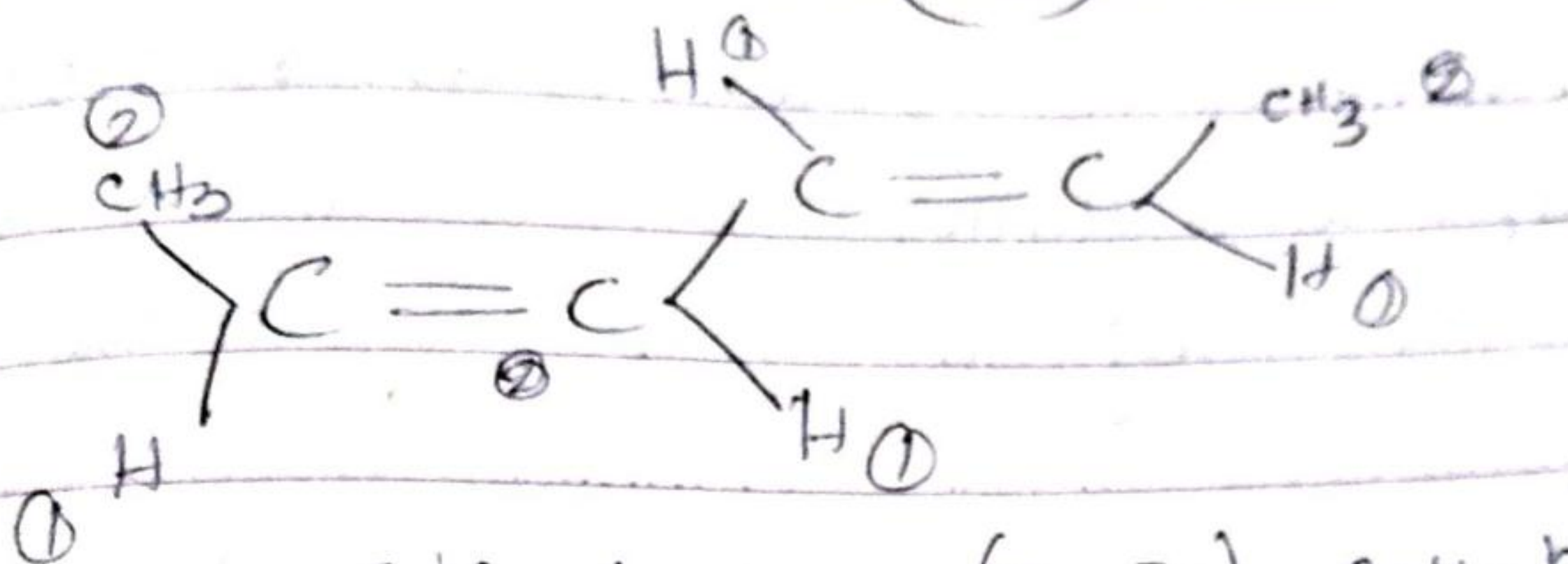


cis, cis or (Z, Z) - 2,4-hexadiene





Trans-trans or (E,E) - 2,4-hexadiene



cis-trans or (Z,E) - 2,4-hexadiene

To name the config. in (c) the following procedure is ~~adopted~~ adopted —

(i) cis and trans, and z and E are listed in the same way as the C's are numbered,

(ii) When config. about one C=C bond is determined -CH=CH·CH₃ is considered as one substituent and H as another, and certainly -CH=CH·CH₃ has priority over H. Thus when CH₃ and -CH=CH are on the same side of the double bond is designated as Z, if otherwise, E.

(iii) cis and trans designations are given when the two H's one on each atom of C=C bond are on the same side or opposite side of the double bond respectively.