Name: OWOSHO BASHIRAT BOLATOKO

Department: Medicine and Surgery

Level: 100 Level

matric number: 19/MHS01/371

Chemistry 102:

1.) Name the functional groups in each of the following molecules;

(i.) $CH_2=C(OH)HCHO$ ⟶ Aldehyde [-CHO]; Hydroxyl [OH]

ii) $CH_6H_5CH(NH_2)(OCH_3$ ⟶ Carbonyl group [-C=O] Amine [$-NH_2$]

iii) $CH_2=CHCH(OH)CHO$ ⟶ Hydroxyl group (-OH) Aldehyde (-CHO)

2.) A 0.856g sample of pure (2R, 3R) tartaric acid was diluted to $10cm^3$ with water and placed in a 1.0 dm^3 polarimeter tube. The observed rotation at 25°C was +1.0°C. Calculate the Specific rotation of (2R, 3R) - tartaric acid.

Solution:

Specific rotation = Observed rotation in degrees / Concentration in gcm^{-3} × path length of Sample cell in dm^3

Observed rotation $= +1.0^\circ$

Concentration in $g\,cm^{-3} = 0.0856\,g\,cm^{-3}$

$0.856\,g$ in $10\,cm^3$

$\therefore$ in $1\,cm^3$ (per cm^3) $= 0.856\,g \div 10\,cm^3 = 0.0156\,g\,cm^3$

path length of sample cell in $dm^3 = 1.0\,dm^3$

$\therefore$ Specific rotation $= \dfrac{+1.0^\circ}{0.0856\,g\,cm^{-3} \times 1.0\,dm^3} = +11.682\,g^{-1}\,cm^3\,dm^{-1}$

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

i) Hexa-2,4-diene

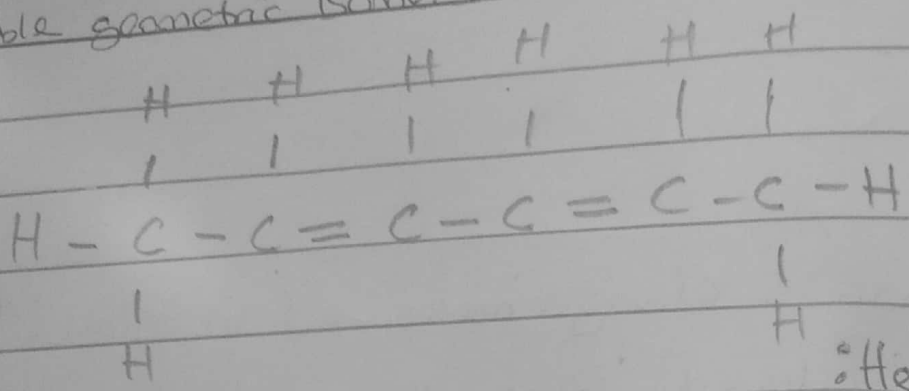
ii.) 2,3-dimethyl-but-2-ene.

Solution

i) Hexa-2,4-diene [$CH_3CH=CHCH=CHCH_3$]

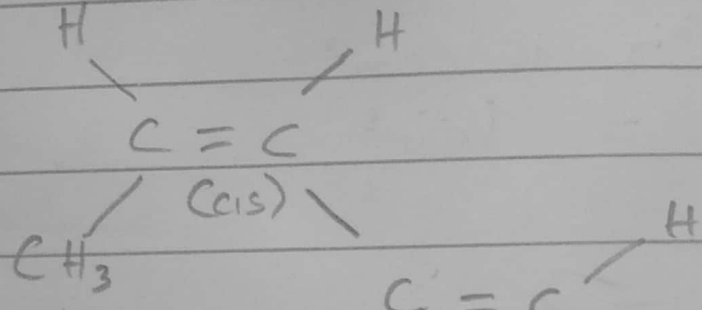
possible geometric isomers

I:



: Hexa-2,4-diene

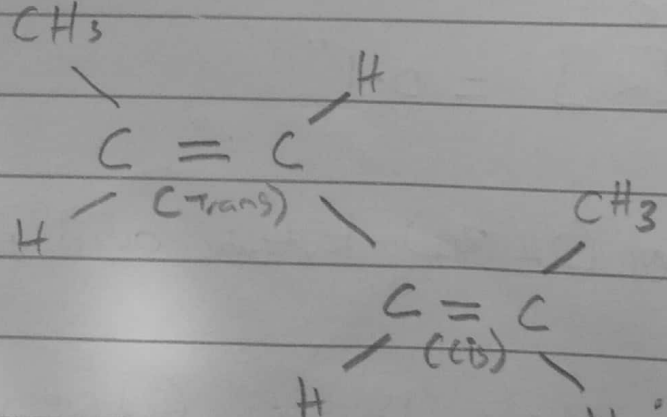
II:



: ~~Cis-1,trans-4dimethy~~

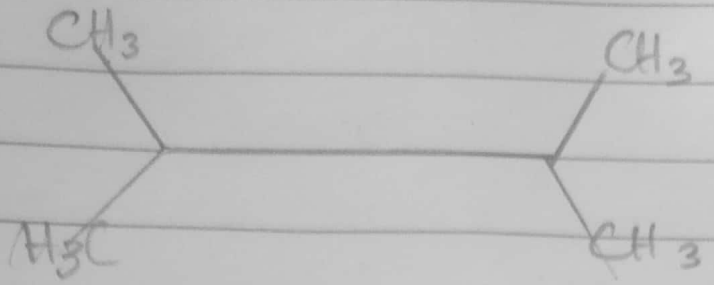
: Cis-1,trans-4dimethyl but-2-ene

III:



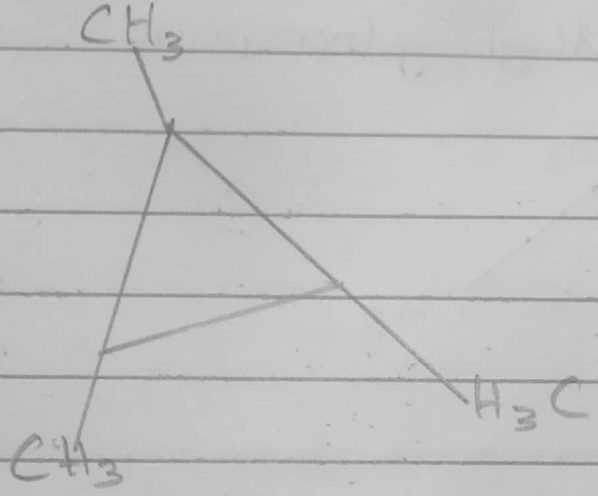
H : Trans-1,Cis-4-dimethyl but-2-ene

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

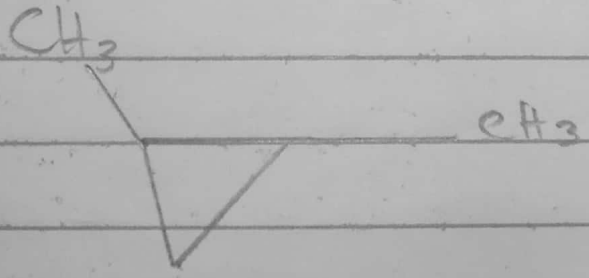


possible Geometric isomers

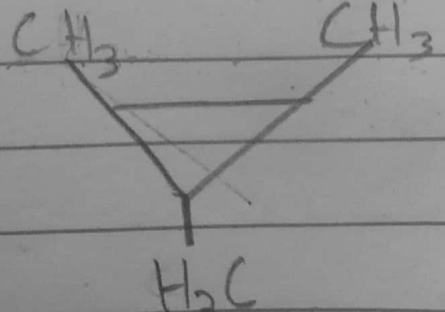
I: 1-cis-2-trans-3-trimethyl cyclopropane.



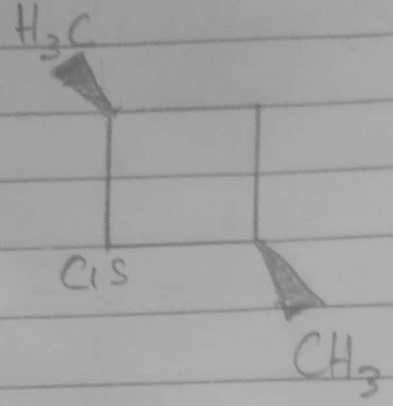
II: 1-methyl-trans-2-ethyl Cyclopropane.



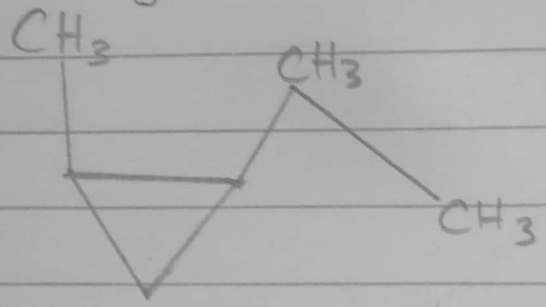
III: Cis-1,2,3-trimethyl Cyclopropane.



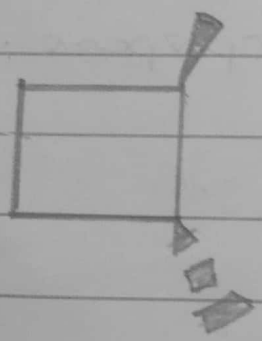
14.) Cis - 1,3 - dimethyl cyclobutane



15.) Cis - 1 - methyl - 2 - ethyl Cyclopropane.



16.) Trans - 1,2 - dimethyl cyclobutane



(ii) Trans - 1,3 - dimethyl cyclobutene.