Name: Oyedepo Oluwafimayomi Deborah

Department: Medicine and surgery

Matric number: 19/MHS01/373

Course code: CHM 102

Course title: General chemistry II

1(i) $CH_2=C(OH)HCHO$

Functional groups present:

(a) C-C (Alkane)

(b) C=C (Alkene)

(c) -OH (Alkanol)

(d) -CHO (Aldehyde)

(ii) $C_6H_5CH(NH_2)COCH_3$

Functional groups present:

(a) C-C (Alkane)

(b) $-NH_2$ (Amine)

(c) C=O (Ketone)

(iii) $CH_3C=CHCH(OH)CHO$

Functional groups present:

(a) C-C (Alkane)

(b) C=C (Alkene)

(c) -OH (Alkanol)

(d) -CHO (Aldehyde)

2. Specific rotation = $\frac{\text{Observed rotation}}{\text{Concentration in g/cm}^3 \times \text{Path length of sample cell in dm}}$

If 0.856g of tartaric acid was diluted to $10cm^3$ with water,

xg of tartaric acid will be diluted to $1000cm^3$

$$\frac{x \times 10cm^3}{10cm^3} = \frac{0.856g \times 1000cm^3}{10cm^3}$$

$$x = 85.6g$$

∴ Mass concentration (concentration in g/cm^3 = $85.6g/cm^3$

Observed rotation = $+1.0°$

Path length of sample in dm = 1.0dm

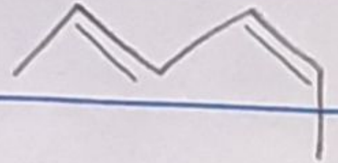
$$\text{specific rotation} = \frac{+1.0°}{85.6 \times 1} = 0.0117° g^{-1} cm^3 dm^{-1}$$

3(i) Hexa-2,4-diene

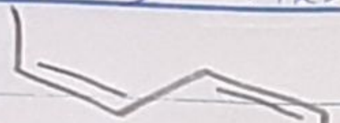
a The four possibilities are (E,E), (E,Z), (Z,E) and (Z,Z) but (E,Z) and (Z,E) are identical so there are 3 geometric isomers

a. (2E, 4E)-hexa-2,4-diene

b. (2E, 4Z)-hexa-2,4-diene



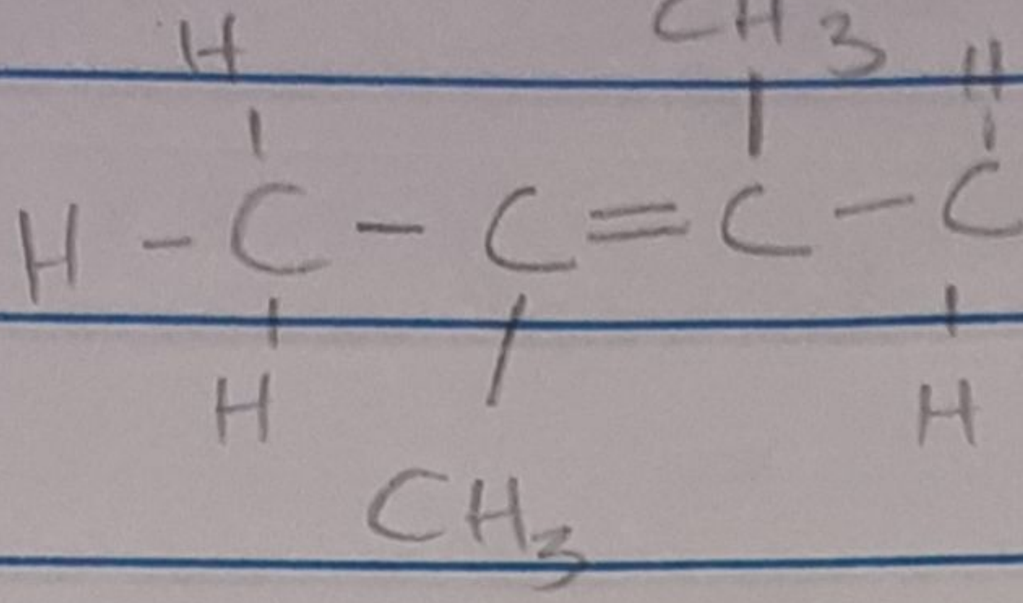
c. (2Z, 4Z)-hexa-2,4-diene



(iii) 2,3-Dimethyl but-2-one

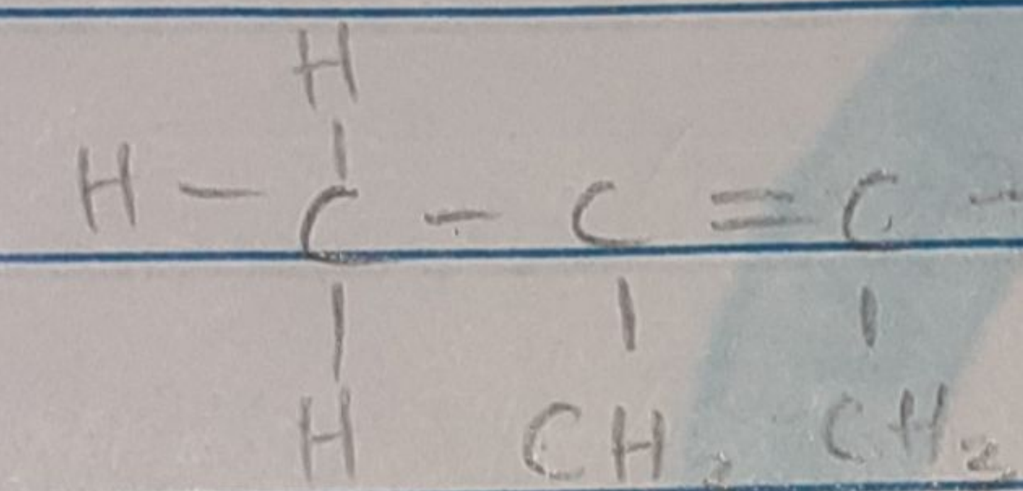
The possible geometric isomers are:

a.



trans-2,3-Dimethyl but-2-ene

b



Cis-2,3-Dimethyl but-2-ene