**NAME: OZIORO PEACE DOUTIMI**

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Assignment title: General chemistry

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**Question 1**

**A**. Suggest possible formulas for a molecular ion (m/z) of 105.

ANS

Step 1- if the mass of the molecular ion is odd it contains at least one nitrogen N=14 atoms 105-14=91

Step 2- determine max NC”S

91/12=7.5 C7NH?

Step 3- add enough H”s to make up the rest of the mad

7\*12=84

1\*14=14

105-(84+14)=7

7H”S gives C7NH7

(2n+2-7)/2=2(7.5)+2-7/2=5.25

Step 4- add an O atom

C7NH9-C6NOH3

(2(6.5)+2-3)/2=5.5=6.

**B**. What are the importance of organic compounds.

ANS

Organic compounds have versatile bonding patterns and are part of all organisms. They are important because all living organisms contain carbon. The three macromolecules of life are carbohydrates, fats and proteins.

1. Feul. 5. Dyes

2. Food. 6. Explosives

3. Medicines. 7. Insecticides

4. clothes

**C.** Differentiate between homocyclic and heterocyclic compounds.

ANS

Homocyclic or carbocyclic compounds contain rings which are made up of only one kind of atoms, I. e carbon atoms. Cyclic compounds that contain one or more atoms other than that of carbon atoms in their rings called heterocyclic compounds.

Homocyclic compounds contain atom of the same element but Heterocyclic compounds contain different elements

Homocyclic compounds having same element as ring members while Heterocyclic are different

Examples of Homocylic are benzene, cyclohexanol while for Heterocyclic are azocide, pyran

**Question 2.**

**A.** If the distance of the solvent front is 12.2cm, 2.4cm, 5.6cm and 8.9cm are distances of the different bands respectively. Calculate the retardation factor of the available bands.

ANS

R. f of the band: distance travelled by the band

distance travelled by the solvent

R. f of the first band: 24 = 0.2

12. 2

R. f of the second band: 5.6

12.2 =0.45

R. f of the third band: 8.9

12.2 =0.729

**B.** Two organic compounds were labelled A and B. A gave a positive result (dark grey precipitate) to Tollens test and B decolourizes Bromines water. Suggest the family to which these organic compounds belong.

ANS

A- belong to the family of the aldehyde, aromatic aldehyde and alpha hydroxyl ketone functional and B- belongs to the alkene or alkyne family

**C.** 2,4-Dinitrophenylhydrazine test is employed for………

ANS

Functional group is ketone and aldehydes

In the treatment of Psychotic and Psychoneurotic

**D.** List 7 functional groups of organic compounds giving two examples of each group.

ANS

1. Alkanes functional group e. g propane and pentane

2. Alkenes functional group e. g ethane and propene

3. Ketone functional group e. g 3-butanone and 4-pentanone

4. Alkynes e . g ethyne and heptyne

5. Ester functional group e. g methyl ethanoate and methyl propanoate

6. Aldehydes e. g ethanol and pentanal

7. Carboxylic acid e. g benzoic acid and prop ionic acid