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**MATRIC NO: 17/MHS01/161**

**DEPARTMENT: MEDICINE AND SURGERY**

A. Molar mass of nitrogen= 14

Molar mass of carbon= 12

105-14=91

91/12= 7.58

The number of moles of carbon is 7

7\*12=84

91-84=7

First possible formula=

Oxygen is introduced to find the second possible formula of the molecular ion.

105-14=91

91-16=75

75/12=6.25

Number of moles of carbon atoms is 6

6\*12=72

75-72=3

Second possible formula of the compound is

B. Importance of Organic Compounds:

i) Organic compounds are important because they serve as the basis for all carbon-based life on earth, create energy production in biological life, atmospheric depletion and release hydrocarbon energy.

ii) Proteins, lipids and carbohydrates are necessary to sustain biological processes such as metabolism, respiration and blood circulation.

iii) In the medicinal field, organic compounds are indispensable. Antibiotics, sulpha drugs, alkaloids, aspirin, iodoform etc. are composed of organic compounds.

iv) The chemical substances that make up our bodies are organic; DNA, proteins and enzymes.

v) Ancient life forms buried beneath the surface of the earth turned into hydrocarbons that form the basis of humanity’s mechanical energy consumption. Crude oil is fe refined into gasoline, diesel, kerosene, propane and natural gas to provide fuel for automobiles and heating systems.

C. Differences between Homocyclic and Heterocyclic Compounds

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| --- | --- |
| Homocyclic Compounds | Heterocyclic Compounds |
| 1. They are cyclic compounds having atoms of the same element as ring members | They are cyclic compounds having atoms of different elements as ring members including carbon atoms |
| 2. Examples include benzene, cyclohexane, toluene, cyclohexanol, etc. | Examples include pyran, azocine, thiocane, etc. |

**QUESTION 2**

A) R.F=distance travelled by the centre of a spot/ distance travelled by solvent front

i)2.4/12.2 = 0.197

ii) 5.6/12.2 = 0.459

iii) 8.9/12.2= 0.730

B) A is an aldehyde

B is an alkene

C) 2,4- dinitrophenylhydrazine is used to test for carbonyl groups associated with aldehydes and ketones.

D) Functional groups and examples:

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| Functional groups | Examples |
| 1. Alkene | Ethylene, propene |
| 2. Alkane | Methane, pentane |
| 3. Alkyne | Acetylene, octyne |
| 4. Aldehyde | Acetaldehyde, butyraldehyde |
| 5. Carboxylic acid | Acetic acid, butyric acid |
| 6. Ester | Ethyl acetate, methyl ethanoate |
| 7. Ether | Dimethyl ether, ethyl methyl ether |