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**Matric no: 17/MHS01/026**

**CHEM 102**

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

1. What are the importance of organic compounds
2. Differentiate between homocyclic and heterocyclic compounds

**QUESTION 2**

1. If the distance of the solvent front is 12.2 cm. 2.4cm, 5.6 cm and 8.9cm are distances of the different bands respectively. Calculate the Retardation factor of the available bands.
2. Two organic compounds were labelled A and B. A gave a positive test result (dark grey precipitate) to Tollens test and B decolourizes Bromine water. Suggest the family to which these organic compounds belong.
3. 2,4-Dinitrophenylhydrazine test is employed for .............................................................
4. List 7 functional groups of organic compounds giving two examples of each group.

 ANSWER

**QUESTION 1A**

Suggest possible formula for a molecular ion (m/2) of 105

N=14amu 105-14=91

91/12=7.5

Add enough it’s to make up the rest of the mass

 7H’s gives C7NH7

(2(7.5)+2-7)/2 =5

12×7=84 , 1×14

105-(84+14)=7

Adding an O atom (-CH4 when adding O )

C7NH7 =C6NOH3

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

QUESTION1 B

**- In nucleic acids**

Nucleic acids are essential biopolymers for all life forms (DNA is included in this category).

They are composed of many elements but mainly coal and hydrogen, although there are also oxygen atoms in their sugars.

**2- In carbohydrates**

Carbohydrates play an important role in living organisms. Polysaccharides serve to store energy and as structural components in plants and arthropods, for example. A type of saccharide is important in the molecules that make up the DNA

**3- As the basis of food**

Food materials are created from carbon compounds via carbohydrates, proteins and fats. All the food we consume is reconstituted material and extracts of plants or animals.Organic molecules make up a large portion of the human diet and are found in all food consumed by an individual. It requires a large number of organic molecules needed to keep cells and tissues healthy.

**4- In lipids**

It consists of a group of molecules that occur in nature like fats, waxes, sterols, monoglycerides and triglycerides, among others. The main functions of lipids include storing energy, signaling lipid and acting as a structural component of cell membranes.

Lipids have applications in the cosmetics industry and in the food industry, as well as nanotechnology.

**5- In metabolism**

The three main purposes of metabolism are energy / fuel conversion as energy for cellular processes, energy / fuel conversion to build blocks for proteins, lipids, nucleic acids, and some carbohydrates, as well as the elimination of nitrogenous.

**QUESTION 1C**

|  |  |
| --- | --- |
| Homocyclic compound  | Heterocyclic compound |
| Homocyclic compound are cyclic compounds atoms of the same element as ring memebers | Heterocyclic compouns are compounds having atoms of the different element as ring members including carbon atom |
| Ring contains atom of the same element  | Ring contain atoms of different element  |
| Contain atom of the same element bonded to each other forming a ring  | Contain atoms of at least two different elements bonded each other forming a ring . |

No2

**QUESTION 2A**

Retardation factor= distance moved by substance/distance moved by solvent front

Let band A=2.4cm, B=5.6cm, C=8.9cm solvent front=12.2cm

RfA = 2.4/12.2

 =0.197

RfB = 5.6/12.2

 =0.459

Rfc =8.9/12.2

 =0.729

**QUESTION 2B**

A- +ve to tollen test

B - +ve to bromine test

A is an alkanal

B is an alkene

**QUESTION2C**

2,4-Dinitrophenylhydrazine test is employed for identifying alkanone and alkanal compound

**QUESTION 2D**

|  |  |
| --- | --- |
| Functional group | Examples |
| Ketones  | 3- pentanone ,hexanone |
| Amines | Propanamine |
| Ester | Methyl propnoate |
| Hydroxyl | Hexan-3-ol, butanol |
| Aldehyde  | Propanal, hexanal |
| Alcohol | Propanol |
| Halogen | Chloromethane, bromoethane |