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**MATRIC NUMBER : 17/MHS01/144**

**COURSE CODE : CHM 102**

1. **Suggest possible formulas for a molecular ion (m/z) of 105.**
2. Given **105**, since its **105** it is odd and it has a nitrogen To find hydrogen deficiency

 Taken N=**14amu** **= (2N + 2-H)**

 Therefore, **105-14=91** **2**

 To find the mass number of carbon **= [2(7.6) +2-7]**

 Therefore, **91÷12=7.6** **2**

 Therefore**, 7** is the number of mole for carbon. **= 15.2-5**

 For hydrogen **2**

 **7×12=84**, therefore **91-84=7** **= 5.1**

 Therefore**, 7** is the number of mole for hydrogen

 The formula is **C7NH7**

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| Oxygen was introduced To find hydrogen deficiency Therefore, **105-14=91 = (2N + 2-H)**Taking **O=16 2**Therefore, **91-16=75 = [2(6.25) + 2-3]****75÷12=6.25 2**Therefore**, 6×12=72 = 12.5-1**Therefore **72** is the number of carbon atom **2****75-72=3 = 5.75**Therefore **3** is the number of hydrogen atom  The formula is **C6NOH3**  |

1. **What are the importance of organic compounds.**
	1. Ethanol is an essential material in the beverage industry
	2. Food materials are produced from carbon compounds.
	3. Important in medicine for production of drugs
	4. Used in industries for production of antiseptic
	5. They are important constituents of crude oil therefore used as fuels for automobiles.
2. **Differentiate between homocyclic and heterocyclic compounds**

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| **Homocyclic compounds**  | **Heterocyclic compounds**  |
| 1.Homocyclic compounds are cyclic compounds having atoms of the same element as ring members.  | 1.Heterocyclic compounds are cyclic compounds having atoms of the different elements as ring members including carbon atoms.  |
| 2. Phenol, toluene, naphthalene, and anthracene. | 4.Tetrahydrofuran, piperidine, pyridine, furan and pyrrole. |

**Question2**

1. **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.**

 Solution.

Using the formula:

Retardation Factor= Distance moved by substances.

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| Distance moved by solvent fro |

 To find A=2.4cm, B= 5.6cm and C=8.9cm. GIVEN THAT THE SLOVEN FRONT IS 12.2cm

To find a=2.4cm

RF= A = 2.4cm = 0.20

 12.2cm 12.2cm

To find b= 5.6cm

RF= B = 5.6cm =0.46

 12.2 12.2cm

To find c= 8.9cm

RF= C = 8.9cm =0.73

 12.2cm 12.2cm

**B. two organic compound were labelled A and B. A gave a positive test result (dark grey precipitate) to tollens test and B decolorizes bromines water. Suggest the family to which these organic compounds belong.**

Answer.

A=‘’Aldehydes’’

B= Bromine water is able to be decolorized by unsaturated compounds like ‘’alkenes’’ and ‘’alkynes’’.

**C. 2, 4-dinitrophenylhydrazine test is employed for** carbonyl functionality for a ketone or aldehyde functional group.

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

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| **FUNCTIONAL GROUP** | **Examples**  |
| -C-H (alkanes) | Methane, Decane,Pentane, Hexane e.t.c |
| >C=C< (alkenes) | But-1-ene , Propene, Ethene, But-2-ene. |
| -C≡C- (alkynes) | Propyne , 1-Butyne , 2-Pentyne |
| -OH (alkanols) | Methanol , Ethanol, Octanol, Heptanol. |
| -COOH (alkanoic acids) | 2-Ethylhexanoic acid, Decanoic acid, Formic acid. |
| -NH2 (amines) | Methylamines, ethylamines etc.  |
| -COOR (Ester) | Ethyl ethanoate , butyl acetate. |