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**QUESTION 1**

**A)** Fragment at m/z =105

Step1- if the mass of the molecular ion is odd it contains at least one nitrogen N= 14 atoms 105-14=91

Step2- determine max NC’S

91/12 = 7.5 C7NH?

Sep3- add enough H’s to make up the rest of the madd

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

Step4- add an O atom

C7NH9→C6N0H3

(2(6.5) + 2−3)/2=5.5 ~6.

B) 1) it is used as a cleansing agent in industries.

2) it is used as a sterilizing agent, examples are phenol and formaldehyde

3) it is also used to make valuables e.g. graphite , diamonds , petroleum etc

4) it is used to make explosives e.g. T.N.T, nitrocellulose, nitroglycerine

5) insecticides are also produced with organic compounds e.g. D.D.T, malathion, gammexane.

6) organic compounds are used to generate energies e.g. petroleum, coal.

7) it is used as dyes e.g. alizarin, indigo etc 8) it is also used to produce drugs to fight against diseases 9) it is used to make fibres which occur in the food we eat and the clothes we wear

**C)**

|  | **Homocyclic compounds** | **Heterocyclic**  **Compounds** |
| --- | --- | --- |
| 1 | It ring contains only one type of atom | It ring contains at least two different types of atoms including carbon |
| 2 | For it atomic composition of ring, it has 100% carbon atoms in their ring | For its atomic composition of ring, it has mainly carbon and in addition heteroatoms e.g. oxygen ,sulphur or nitrogen are found in their ring |
| 3 | It has a sub-division of alicyclic homocyclic and aromatic homocyclic | It has a sub-division of alicyclic heterocyclic and aromatic heterocyclic |
| 4 | It’s examples ate toluene, phenol, naphthalene and anthrscene | Its examples are furan, phyrole, phyridine, tetrahydrofuran |

**QUESTION 2**

1. **RF=**  distance moved by the substance ÷ distance moved by the solvent front
   1. **Rf =** 2.4cm ÷ 12.2 cm = 0.196cm
   2. **Rf=** 5.6cm ÷12.2cm=0.459cm
   3. **Rf**= 8.9cm ÷12.2 cm= 0.7295cm

1. **i) A=**  aldehyde (alkanal)

**ii) B=** Alkenes.

1. It is employed for aldehyde and ketones

|  |  |  |
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|  | **FUNCTIONAL GROUP** | **EXAMPLES** |
| **1** | **-COOH** | **Ethanoic , propanoic** |
| **2** | **-CHO** | **Methanal ,butanal** |
| **3** | **-OH** | **Propanol, methanol** |
| **4** | **-NH2** | **Methylamines , proplyamine** |
| **5** | **-C=O** | **Propanone , ethanone** |
| **6** | **-COOR** | **Ethyl ethanoate , proply ethanoate** |
| **7** | **-O-** | **Diethyl ether, dimethyl ether** |