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**DEPARTMENT:** Medicine and Surgery

1a. $^{m}/\_{z}$ = 105

Since $^{m}/\_{z }$= 105 is odd , it contains at least one nitrogen

N=14amu

105-14=91

Number of carbon atoms = $\frac{91}{12}$ =7.5

 $C\_{7}NH\_{x}$

X= 105-[(7×12) + (14×1) ]

X=7

 $C\_{7}NH\_{7}$

 $\frac{\left(2×7.5\right)+ 2-7}{2}$ =5

Addition of Oxygen; $C\_{7}NH\_{7}$ → $C\_{6}NOH\_{3}$

1b. **Importance of Organic Compounds**

i. organic compounds are the main components of the food we eat. E.g in carbohydrates and proteins, they are the main building blocks.

ii. Organic compounds are used in making drugs medicines and are the main components of drugs e.g. penicillin, aspirin etc.

iii. In industries and laboratories, organic solvents are used as cleansing agents to clear impurities.

iv. organic compounds are the main components of valuables found in the world like diamond, petroleum etc.

v. Most of the sterilizing agents and disinfectants like phenol are made up of organic compounds.

Ic**. Difference Between Homocyclic and Heterocyclic Compound**

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| Homocyclic Compound | HeterocyclicCompound |
| 1. they have 100% carbon atoms in their rings | They have mainly carbon and in addition heteroatoms such as nitrogen, oxygen and sulphur in their rings. |
| 2. Their rings contain only one type of atom. | Their rings contain at least two different types of atoms including carbon.  |
| 3. They are divided into alicyclic and aromatic homocyclic compound. | They are divided into alicyclic and aromatic heterocyclic compound. |

2a. $R\_{f}$= $\frac{distance moved by substance}{distance moved by solvent front}$

Distance moved by solvent front = 12.2cm

 - $R\_{f2.4}$ = $\frac{2.4}{12.2}$

 $R\_{f2.4}$ =0.197

- $R\_{f5.6}$ = $\frac{5.6}{12.2}$

 $R\_{f5.6}$ = 0.459

 - $R\_{f8.9}$ = $\frac{8.9}{12.2}$

 $R\_{f8.9}$ = 0.730

2b. compound A is an Aldehyde

 Compound B is an alkene

2c. 2,4-Dinitrophenylhydrazine test is employed for Ketones and Aldehydes

2d.

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| Functional group  | Examples |
| Alkanoic Acids (RCOOH) | Ethanoic acid(C$H\_{3}$COOH), butanoic acid $(H\_{7}OOH)$ |
| Esters (RCOOR) | Methyl ethanoate($CH\_{3}COOCH\_{3}$), Methyl methanoate ($HCOOCH\_{3}$), |
| Alkanal (RCHO) | Methanal(HCHO) , Pentanal ($C\_{4}H\_{9 }CHO$) |
| Alkanol(ROH) | Propanol ($C\_{3}H\_{7 }OH$), Butanol($C\_{4}H\_{9 }OH$) |
| Amides (RCON$H\_{2}$) | Ethanamide ($CH\_{3}CONH\_{2}$), Butanamide ($C\_{2}H\_{5}CH\_{2}CONH\_{2}$) |
| Amines (RN$H\_{2}$) | Methylamine ($CH\_{3}NH\_{2}$), Ethlyamine ($C\_{2}H\_{5}NH\_{2}$) |
| Alkanone | Propan-2-one ($CH\_{3}COCH\_{3}$), Butan-2-one ($CH\_{3}COC\_{2}H\_{2}$)  |