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**MATRIC NUMBER:** 17/MHS01/223.

**DEPARTMENT:** MBBS.

**QUESTION 1**

1. Mass total = 105

Mass of carbon & hydrogen=105 – 14= 91

91/12=7r7

7 carbon atoms

7 hydrogen atoms

1 nitrogen atom = C7H7N (possible molecular formula)

\* Assuming oxygen is present

 mass total-mass of oxygen+mass of nitrogen =

 105-16+14=75

 75/12= 6r3

 C6H3ON (possible molecular formula)

**b**. **Importance of organic compounds.**

1. Food: Carbohydrate, Proteins, Fats, vitamins, Enzymes, etc.

2. Clothes: - Cotton, Silk, Wool, Nylon, Rayon, Dacron, etc.

3. Fuels: - coal, Wood, Natural gas, Petrol, etc.

4. Medicines: - Penicillin, Streptomycin, Chloromycetin, Sulphadiazine, Morphine, Aspirin, Iodoform, Cocaine, etc.

5. Explosives: - Nitroglycerine, Nitrocellulose, T.N.B, T. N.T, etc.

6. Dyes: - Indigo, Malachite green, Alizarin, etc.

7. Insecticides: - D.D.T, Gammexane, Malathion, etc.

8. Household and other common articles: - soaps, cosmetics, perfumes, detergents, paper, rubber, plastics, leather, resins, inks, paints, varnishes, photographic films, etc.

**c. Differences between homocyclic compounds and heterocyclic compounds.**

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| --- | --- |
| **Homocyclic Compounds** | **Heterocyclic Compounds** |
| They are used as cleaning agents and antiseptic | They are used as dyes, pesticides etc. |
| Their ring structure consists of only carbon atoms. | Their rings contain at least one non-carbon atom |
| Absence of other atoms aside carbon | Other atoms are called heteroatoms such nitrogen, oxygen |
| They are sub-divided into alicyclic homocyclic and aromatic homocyclic | It is sub-divided into alicyclic and aromatic heterocyclic |
| Examples of such compounds include phenol, toluene, Naphthalene, anthracene | Examples of such compounds are tetrahydrofuran, piperidine, pyridine, furan, DNA nucleotide bases. |

**QUESTION 2**

1. Solvent front = 12.2cm

Band A = 2.4 cm

Band B = 5.6 cm

Band C = 8.9 cm

R*f* = (band x) cm/ (solvent front) cm

R*f* of band A= 2.4cm/12.2cm = 0.196

R*f* of band B= 5.6cm/12.2cm = 0.45

R*f* ofband C=8.9cm/12.2cm =0.72

1. Since substance A gave a positive result by producing a dark grey precipitate to Tollens test, it is an aldehyde. Substance B decolourized bromine therefore it is an unsaturated compound. Either an alkene or alkene.
2. 2,4-Dinitrophenylhydrazine test is employed for aldehydes and ketones.
3. **Functional groups of organic compounds and two examples of each.**

|  |  |
| --- | --- |
| Functional groups  | Examples |
| Alkane  | butane(C4H10), propane(C3H8) |
| Alkene | But-1-ene (C₄H₈), prop-1-ene(C3H6) |
| Alkyne | Propyne(CH₃C≡CH), Ethyne (C2H2) |
| Alkanols | 1-pentanol (C₅H₁₁OH), Propa-1-nol (C3H7OH) |
| Alkanones |  Butanone (CH₃COCH₂CH₃), Propanol (CH3COCH2CH3) |
| Aldehyde | Propanal (CH₃CH₂CHO), Butanal (C3H7CHO) |
| Carboxylic acid | Propanoic acid ( C₂H₅COOH), Butanoic acid (C3H7COOH) |