**Name: OGU DIVINE KELECHI.**

**Department: MEDICINE AND SURGERY.**

**College: MEDICAL AND HEALTH SCIENCES.**

**Course code: CHM IO2-GENERAL CHEMISTRY 2**

**Matric number: 17/MHS01/233.**

**ANSWERS**

Question 1

(a). The possible formulas for the molecular ion of (m/z) 105include the following;

1. C7H5O.
2. C8H4.
3. C5H18S.
4. C6H19N.
5. C3H7OSN.

(b). organic compounds are very important constituents of nature. These compounds are so important that most of the human, animal and even natural activities would be affected if they are not present. Some of their importance is as follows;

1. All organisms contain carbon. This includes all plants and animals in existence. Our body is composed of millions of carbon atoms intertwined in a covalent bond.
2. Carbon is also a constituent of the three basic macro molecules of life. These three macro molecules include carbohydrate ( CH2O), fats and oil (CHO) and proteins (CHON).
3. All the food we eat which are plants and animal extracts also constituent of carbon since they are composed of one or more of the above listed elements.
4. Diamond which is very important in making of jewelries and other accessories is an allotrope of carbon.
5. Plastics are also composed of carbon atoms. Plastics are very important substances as they are used in producing products like plates, cups e.t.c.
6. Natural gases and petroleum are mostly composed of organic compounds.

(c).

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| Homocyclic compounds | Heterocyclic compounds |
| These are molecules that are or contain ring structures that consist of only carbon atoms within the ring. | These are compounds or groups that consist of ring structures that contain at least one non-carbon atom in the ring. |
| Examples include; benzene, toluene, anthracine and naphthalene. | Examples include; furan, pyran, thiophene and thine. |

**Question 2**

(a)i. retardation factor of band A = ==

ii. Retardation factor of band B = = = .

iii. Retardation factor of band C = = =

(b). compound A belongs to the family aldehyde (alkanals) whereas compound B belongs to the family alkenes.

(c). Aldehyde and Ketones.

(d).i. Alkanes : ethane (C2H6) and hexane (C6H14).

ii. Alkenes: butene (C4H8) and octene (C8H16).

iii. Alkynes: octyne (C8H14) and hexyne (C6H10).

iv. Alkanols: methanol (CH3OH) and propanol (C3H7OH).

v. Alkanals: ethanal (C2H4CHO) and heptanal (C7H13CHO).

vi. Ketones: butanone (C4H8CO) and hexanone (C6H12CO).

vii. Alkyl: nonyl (C9H19) and ethyl (C2H5).