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  Question 1  
  a) Suggest possible formulas for a molecular ion (m/z) of 105.  
  Answer
* C7NH7
* C6H3NO  
    
  b) What are the importance of organic compounds  
  Answer  
  1. In nucleic acids  
  Nucleic acids are the most important of all biomolecules. They are found in abundance in all living things, where their function is to create and encode. They are composed of many elements but mainly coal and hydrogen, although there are also oxygen atoms in their sugars  
    
  2. Hydrocarbon  
  Hydrocarbons are organic compounds that are made up entirely of hydrogen and carbon. The prominent use of hydrocarbons is as a source of fuel, in their solid form hydrocarbons can take the form of asphalt.  
    
  3. As the basis of food  
  Food materials are created from carbon compounds via carbohydrates, proteins and fats. Organic molecules make up a large portion of the human diet and are found in all food consumed by an individual   
    
  4. Metabolism   
  Metabolism is usually divided into two categories catabolism, which is the decomposition of organic matter and breakdown of glucose by cellular respiration. And in anabolism, which is the construction of component of cells such as proteins and nucleic acids  
    
    
  c) Differentiate between homocyclic and heterocyclic compounds

|  |  |
| --- | --- |
| **HOMOCYCLIC** | **HETEROCYCLIC** |
| 1. HOMOCYCLIC compounds are cyclic compounds having atoms of the same element as ring members | They are compounds having atoms of the different elements as ring members including carbon atoms |
| 1. Contains atoms of the same element bonded to each other forming a ring | Contains atoms of at least two different elements bonded to each other forming a ring |
| 1. Ring contains atoms of same element | Ring contains atoms of different elements |

* QUESTION 2

a) If the distance of the solvent front is 12.2 cm. 2.4cm, 5.6 cm and 8.9cm are distances of the different bands respectively. Calculate the Retardation factor of the available bands.

Answer

Rf = Ds/Df

Df =12.2

Ds= 2.4cm, 5.6cm, 8.9cm

* 1. For 2.4

Rf=2.4/12.2

=0.196

* 1. For 5.6

Rf=5.6/12.2

=0.459

* 1. For 8.9

Rf=8.9/12.2

=0.729

b) Two organic compounds were labelled A and B. A gave a positive test result (dark grey precipitate) to Tollens test and B decolourizes Bromine water. Suggest the family to which these organic compounds belong.

Answer

A is an aldehyde

B is an alkene  
  
c) 2, 4-Dinitrophenylhydrazine test is employed for qualitative detection of the carbonyl functionality of a ketone or aldehyde functional group.  
  
d) List 7 functional groups of organic compounds giving two examples of each group.  
Answer

* Alkane: methane, propane
* Alkene: Ethene ,propene
* Alkyne: propyne, ethyne
* Ester: ethanol, Methanol
* Ether: dimethyl either, diethyl ether
* Amine: Histidine,tyrosine
* Carboxyl: Pentanoc acid, benzoic acid