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Matric number: 17/ENG06/038

Department: MECHANICAL

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Question 1

1a) Given (M/Z ) = 105

Maximum carbon atom = 105/12 =8.75 = 9 approximately

Since the mass per charge ratio is odd it is possible for nitrogen to be present in the compound

CxHYN then taking the carbon atoms to be 7

H = 105-(84+14)

=7

Compound 1 –C7H7N

IND – (2x7)+2-7+1/2 = 5

Removing 4 atoms of hydrogen add one atom of oxygen

C6H3NO

IND – (2x7)+2-3+1/2 = ­7

1b) organic compounds are important because all living organisms contain carbon

1c)

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| --- | --- | --- | --- |
| |  | | --- | | HOMOCYCLIC COMPOUNDS |   1. They contain only one type of atom including carbon itself.  2. Contain atoms of the same element bonded to each other forming a ring.  3. Examples include benzene, cyclohexane, toluene, cyclohexanol, etc. | |  | | --- | | HETEROCYCLIC COMPOUNDS |   They contain at least different types of atom  Contain atoms of at least two different elements bonded to each other forming a ring.  Examples include pyran,azocine, thiocane, etc. |

Question 2

2a) = =0.20

ii) ==0.5

iii) = = 0.7

b) A: Aldehyde (alkanal)

B: Unsaturated hydrocarbon

c) 2, 4-Dinitrophenylhydrazine test is employed for **ALDEHYDES** and **KETONES**

d) Rx – Alkyl halides - CH3CL , CH3CH2Br

RcooR – Esther – CH3CH2COOCH3, CH3CH2CH2COOCH3

ROH – Alkanol - CH3OH , CH3CH2OH

RCHO – Alkanal – CH3CHO, CH3CH2CHO

RCOOH – Alkanoic acid – CH3COOH, CH3CH2COOH

R- NH2 – Amides –CH3NH2, CH3CH2NH2

R – CO – Acetones –CH3CO, CH3CH2CO

RCOX – Acidic halides - CH3COCL, CH3CH2OBr

RCONH2 – Amides – CH3CONH2, CH3CH2CONH2