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***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) homocyclic compounds heterocyclic

 They contain only one type of atom They contain at least different type of atom including

 carbon itself

Question 2

2a) = =0.20

ii) ==0.5

iii) = = 0.7

b) A: Aldehyde (alkanal)

 B: Unsaturated hydrocarbon

c) 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