

Department: Mechatronics

College: Engineering

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

C_xH_yN then taking the carbon atoms to be 7

$$H = 105 - (84 + 14)$$

$\equiv 7$

Compound 1 $\text{C}_7\text{H}_7\text{N}$

IND ó (2x7) +2-7+1/2 = 5

Removing 4 atoms of hydrogen add one atom of oxygen

$$\text{C}_6\text{H}_3\text{NO}$$

IND ó (2x7) +2-3+1/2 = 7

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

1c)	Homocyclic compounds	Heterocyclic compounds
	They contain only one type of atom	They contain at least different type of atom including carbon itself

Question 2

[illegible]

ii) $\frac{2 \text{ } 2222222 \text{ } 2 \text{ } 2222 \text{ } 22 \text{ } 2222222222}{2 \text{ } 2222222222 \text{ } 2 \text{ } 22222 \text{ } 22 \text{ } 2222222222 \text{ } 22222222} = \frac{2.2}{22.2} = 0.5$

[illegible]

b) A: Aldehyde (alkanal)

B: Unsaturated hydrocarbon

c) Aldehydes and Ketones

d) Rx ó Alkyl halides - CH_3Cl , $\text{CH}_3\text{CH}_2\text{Br}$

RcooR ó Esther ó $\text{CH}_3\text{CH}_2\text{COOCH}_3$, $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOCH}_3$

ROH ó Alkanol - CH_3OH , $\text{CH}_3\text{CH}_2\text{OH}$

RCHO ó Alkanal ó CH_3CHO , $\text{CH}_3\text{CH}_2\text{CHO}$

RCOOH ó Alkanoic acid ó CH_3COOH , $\text{CH}_3\text{CH}_2\text{COOH}$

R- NH₂ ó Amides óCH₃NH₂, CH₃CH₂NH₂

R ó CO ó Acetones ó CH_3CO , $\text{CH}_3\text{CH}_2\text{CO}$

RCOX ó Acidic halides - CH_3COCl , $\text{CH}_3\text{CH}_2\text{OBr}$

RCONH₂ ó Amides ó CH₃CONH₂, CH₃CH₂CONH₂