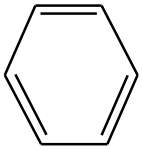
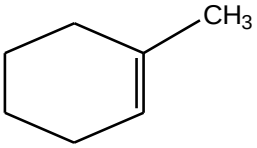
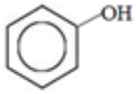
ORGANIC CHEMISTRY WEEKEND QUESTIONS

1. Complete the following organic reactions and outline the accepted reaction mechanism.

(a)  $\xrightarrow{Br_2 / Fe}$ *(3½ marks)*

(b)  $\xrightarrow[\text{warm}]{\text{dilute } H_2SO_4}$ *(2½ marks)*

(c)  $+ CH_3CH_2Br \xrightarrow[\text{heat}]{NaOH_{(aq)}}$ *(03 marks)*

(d) $CH_3\,CH_2CH_2Br + KOH \longrightarrow$ *(03 marks)*

(e)  $\xrightarrow[\text{ethanol}]{\text{Fuming sulphuric acid}}$ *(3 ½ marks)*

(f) $CH_3CH = CH_2 \xrightarrow[\text{heat}]{Cl_2 / H_2O}$. *(3 ½ marks)*

(g) $CH_3\overset{\overset{OH}{|}}{C}HCH_2CH_3 \xrightarrow[170^0C]{\text{Conc } H_2SO_4}$ *(03 marks)*

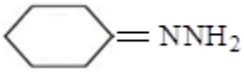
(h) $CH_3\overset{\overset{Br}{|}}{\underset{\underset{CH_3}{|}}{C}}CH_3 \xrightarrow[\text{Ethanol}]{\text{KOH / Heat}}$ *(03 marks)*

(i) $CH_2 = CH_2 \xrightarrow{Cl_2 / H_2O}$ *(03 marks)*

(j) $CH_3CH = CH_2 \xrightarrow[\text{Warm}]{H+ / H_2O}$

2. Write equations to show how the following synthesis can be carried out

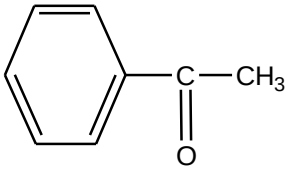
(a) $CH_3CH_2C \equiv CH$ to $CH_3CH_2\underset{Cl}{C}HCH_3$ *(03 marks)*

(b)  from cyclohexen *(03 marks)*

(c) $CH_3\underset{Br}{C}HCH_3$ to $CH_3\underset{OH}{C}HCH_2SO_3Na$ *(03 marks)*

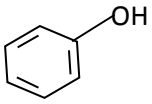
(d) $CH_3CH_2CH_2OH$ to $CH_3\overset{OH}{C}H_2CHCH_3$ *(3½ marks)*

(e) Propanamide from Ethanol *(03 marks)*

(f)  from benzene *(2½ marks)*

(g) Propan – 2 – ol to propanal. (3½ marks)

(h) $CH_3C{\equiv}CH$ from propan-2-ol *(4 ½ marks)*

(b)  from benzene *(03 marks)*

(c) $CH_3CH_2C \equiv CH$ from ethanol *(06 marks)*

(e) $CH_3\ CO_2H$ from ethene. *(2 ½ marks)*

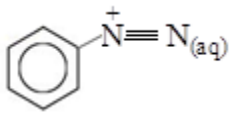
(d) $CH_3CO_2CH_3$ from bromoethane *(04 marks)*

3. Name a reagent that can be used to distinguish between the following pairs of ions. In each case, state what would be observed if each ion is separately treated with the reagent you have named.

(a) $HCO_3^-{}_{(aq)}$ and $CO_3^{2-}{}_{(aq)}$ *(03 marks)*

Reagent ……

Observation……

(b)  and $CH_3CH_2\overset{+}{N}\equiv N_{(aq)}$ *(03 marks)*

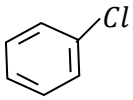
Reagent ……

Observation……

(c) $NO_2^-{}_{(aq)}$ and $NO_3^-{}_{(aq)}$ *(03 marks)*

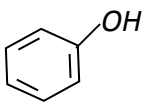
Reagent ……

Observation ……

(d)  and $CH_3CH_2CH_2Cl$ *(03 marks)*

Reagent:……

Observation:……

(e)  and $CH_3\overset{OH}{C}HCH_3$ *(03 marks)*

Reagent:……

Observation:……

(f) $SO_3^{2-}{}_{(aq)}$ and $SO_4^{2-}{}_{(aq)}$ *(03 marks)*

Reagent ……

Observation ……