



e- 1-propanol and acidified potassium dichromate. (.....)

f- propanone and lithium aluminium hydride. (-----)

g- hex-3-ene and cold aqueous  $\text{KMnO}_4$ . (-----)

h- benzoic acid and ethanol, reflux and  $\text{H}_2\text{SO}_4$ . (-----)

i- pent-2-ol and hot concentrated sulphuric acid. (-----)

j- propyl butanoate and hot sodium hydroxide. (-----)

2) Draw the structural formulae for the following organic compounds: (15 marks)

a- phenyl benzoate:

b- tetrachloromethane:

c- 3,4-dibromohexanone:

d- 2-hydroxypropanoic acid:

e- butanedioic acid:

f- ethanoyl chloride:

g- 1,2-benzenedicarboxylic acid:

h- octanal:

i- propanamide:

j- 2-amino-4-hydroxypent-3-enoic acid.

- 3) Starting with 1-butanol, describe all possible reactions involved to convert this primary alcohol into 2,3-dibromobutane. State reaction conditions for each step. (8 marks)

4) Starting with propyne how can you prepare 2,2-diodopropane? (2 marks).

5) starting with pent-1-ene describe how it could be converted into:  
a- 1-bromopentane. b- 2-bromopentane (5 marks).

6) Describe a test to identify the presence of a double bond in a compound. (3 marks).

7) Explain why carboxylic acids have relatively high boiling points as compared with hydrocarbons with similar number of carbon atoms. (2 marks).