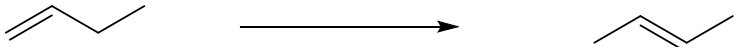
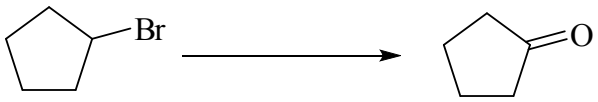
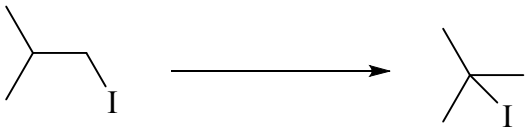
CHEM1102 Problem Sheet 6 (Week 7)

1. Give the reagents required to carry out the following chemical conversions. Draw constitutional formulas for any intermediate compounds. More than one step is necessary in each case.

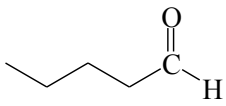
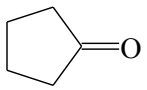
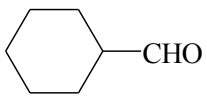
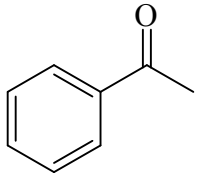
(a) 

(b) $H_2C{=}CH_2 \longrightarrow (CH_3CH_2)_4N^{\oplus}\,Br^{\ominus}$

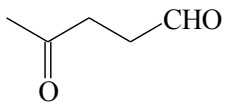
(c) 

(d) 

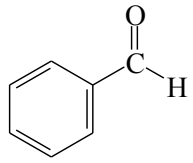
2. Identify the following compounds as an aldehyde or a ketone. Then draw the formula of the major organic products formed on oxidation with acidified potassium dichromate solution and reduction with sodium borohydride followed by aqueous acid. If there is no reaction, write "NR".

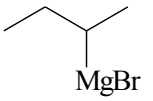
	Starting Material	Functional Group	Oxidation Product	Reduction Product
(a)				
(b)				
(c)				
(d)				

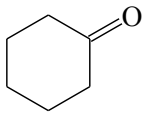
(e)

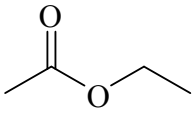
3. Draw the constitutional formula of the major organic product formed in the following reactions. If there is no reaction, write "NR".

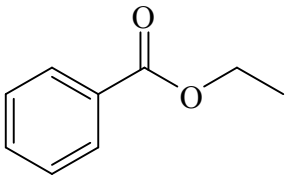
(a)  $\xrightarrow[2)\ H^{\oplus}/\ H_2O]{1)\ CH_3MgI}$

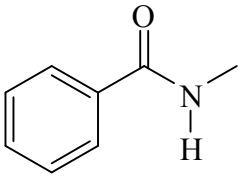
(b)  $\xrightarrow[2)\ H^{\oplus}/\ H_2O]{1)\ CO_2}$

(c)  $\xrightarrow[2)\ H^{\oplus}/\ H_2O]{1)\ CH_3CH_2CH_2MgBr}$

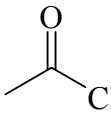
4. Identify the functional group in each of the starting materials below and give the constitutional formula of the major organic product(s) formed in the hydrolysis reactions shown.

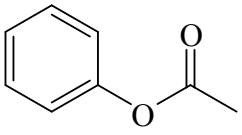
(a)  $\xrightarrow[\text{heat}]{\text{dilute HCl}}$

(b)  $\xrightarrow[\text{heat}]{\text{dilute HCl}}$

(c)  $\xrightarrow[\text{heat}]{\text{conc. HCl}}$

(d) $(CH_3CO)_2O$ $\xrightarrow[\text{heat}]{\text{dilute NaOH}}$

(e)  $\xrightarrow{\text{water}}$

(f)  $\xrightarrow[\text{heat}]{\text{dilute NaOH}}$