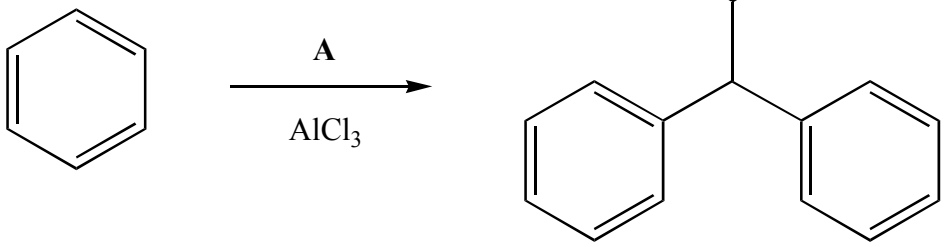
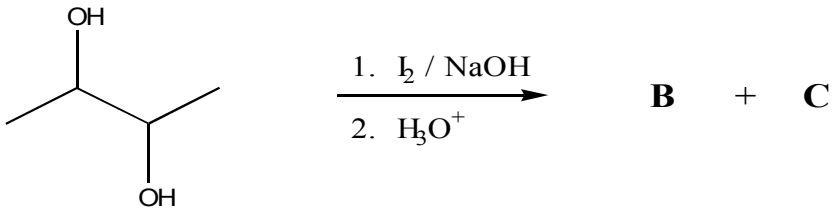
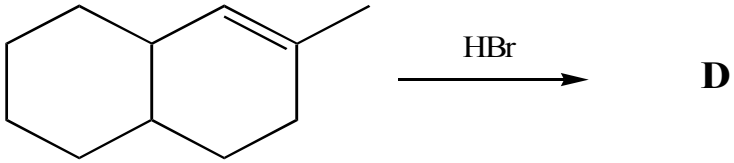
# Immanuel Lutheran College
# S7 Chemistry Test 1 (2006 - 2007)

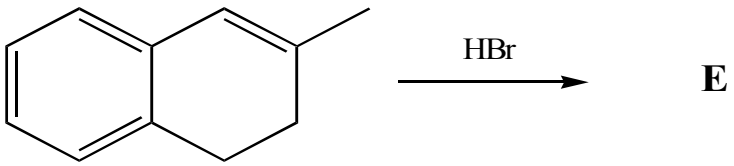
**Time allowed : 105 minutes** **Total marks : 60 marks**

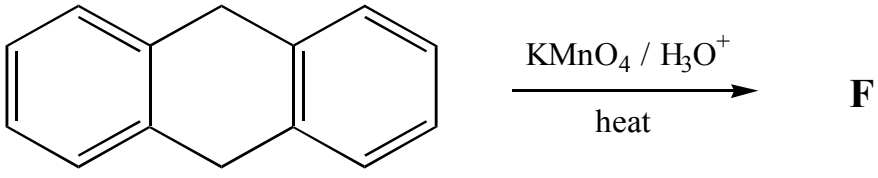
1. Identify **A** to **I** in the following reactions. (For **B to I**, give ***only*** the structures of the major organic products)

(a) 

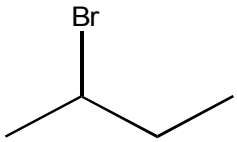

(b) 


(c) 

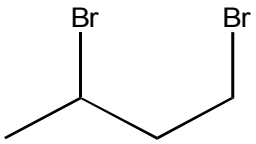

(d) 


(e) 

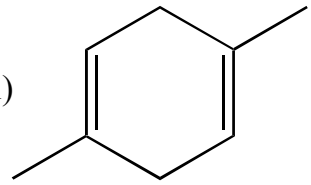
1.

(f) 


$\xrightarrow[C_2H_5OH,\ heat]{KOH}$ **G**

(g) 

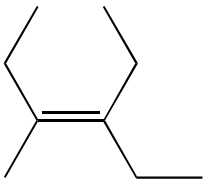
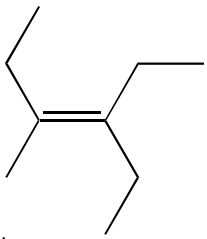

$\xrightarrow[C_2H_5OH,\ heat]{KOH}$ **H**

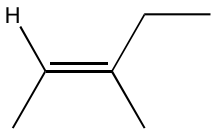
(h) 

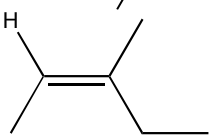
$\xrightarrow[2.\ H_3O^+]{1.\ O_3\ ,\ Zn}$ **I**

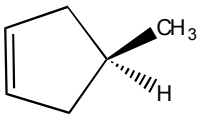
(9 marks)

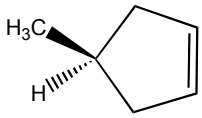
2. (a) For each of the following pairs of molecules, identify their relationship as geometrical isomeric, structural isomeric, enantiomeric, or identical.

(i)  and 

(ii) 

and 

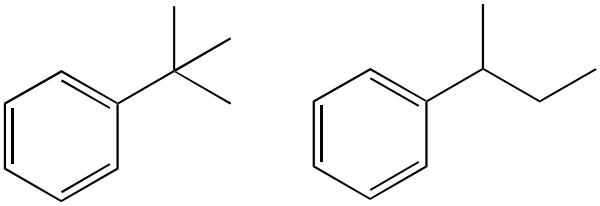

(iii) 

and 


(3 marks)

(b) Outline a chemical test which would allow you to distinguish between the following compounds. Describe what you would observe in the test.

(i) 

(ii) 

(4 marks)

2. (c) Suggest **TWO** reasons for the unreactivity of chlorobenzene towards nucleophilic substitution.

(2 marks)

3. An optically active compound **A**, $C_{10}H_{13}OH$, reacts rapidly with HBr to give **B**, $C_{10}H_{13}Br$, which is optically inactive. **B** reacts with hot KOH to give **C**, $C_{10}H_{12}$. Ozonolysis of **C** gives an aromatic ketone **D**, $C_8H_8O$, and an aldehyde **E**, $C_2H_4O$, as the only products.

(a) Deduce the structures of the compounds **A** to **E**.

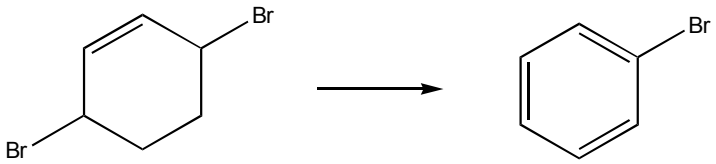
(b) Give a systematic name for **A.**

(c) Explain why **B** produced is optically inactive.

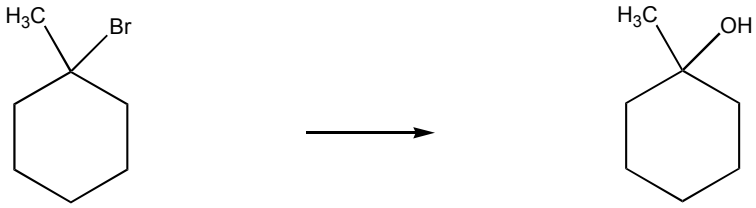
(11 marks)

4. Suggest a synthetic route, *in not more than four steps*, for the following conversions in the laboratory. Give the reagent(s) and conditions for each step and the structures of all intermediates.

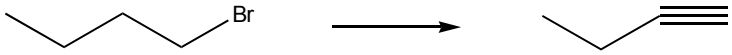
(a)



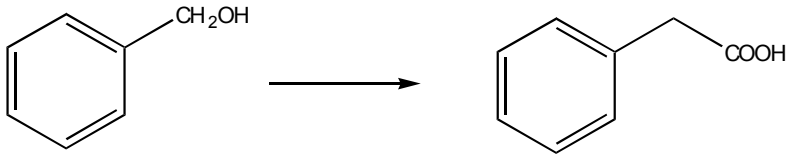

(b)




(c)




(d)




(11 marks)

5. Write an essay on the preparation of halogenoalkanes.
Your essay should include a brief discussion on **THREE** different kinds of reaction mechanisms involved.

(20 marks)

**- End of Paper -**