



Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF PURE AND APPLIED SCIENCES
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF
TECHNOLOGY IN APPLIED CHEMISTRY
BTAC12S/BTAC13S₂

ACH 4203: CHEMISTRY OF AROMATIC COMPOUNDS

SEMESTER EXAMINATION

DECEMBER 2013 SERIES

2 HOURS

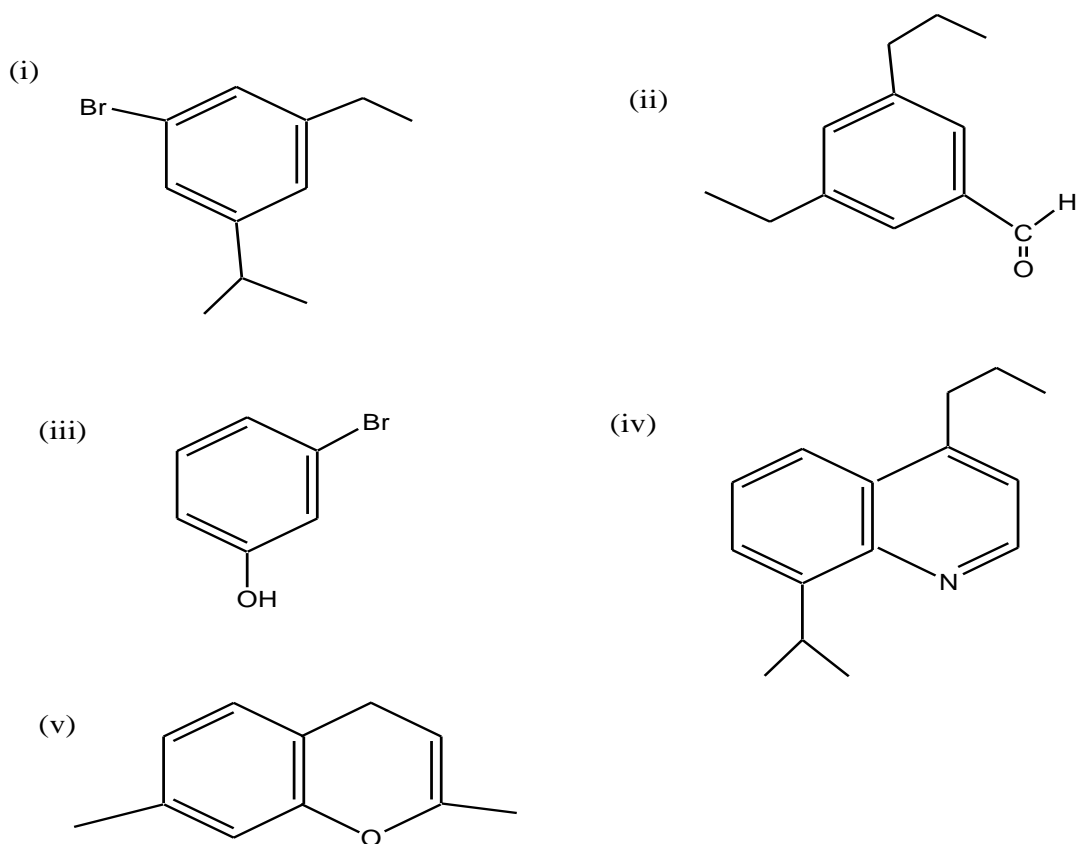
Instructions to candidates:

This paper consists of **FIVE** questions

Answer question **ONE** (compulsory) and any other **TWO** questions

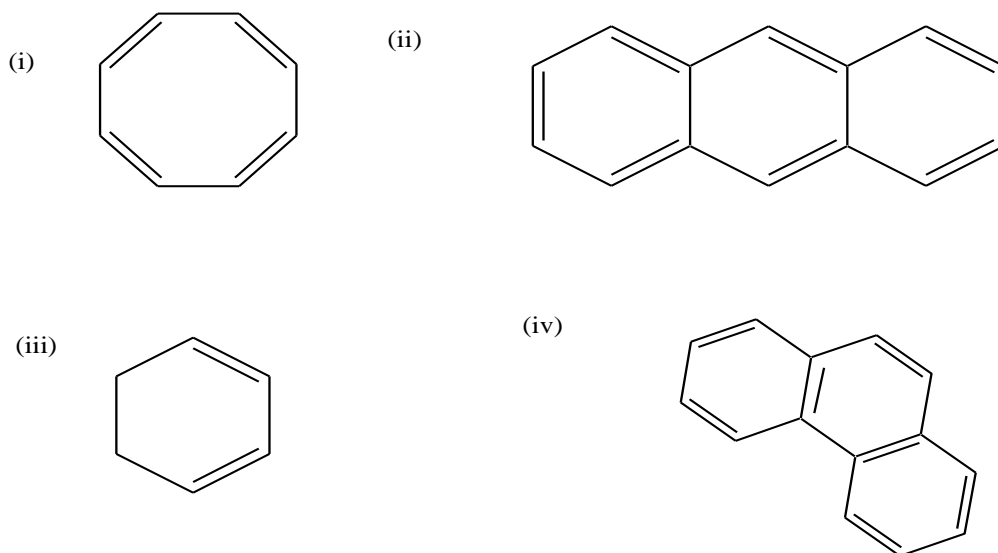
QUESTION ONE

- a) Provide the systematic name for each of the following Compounds:



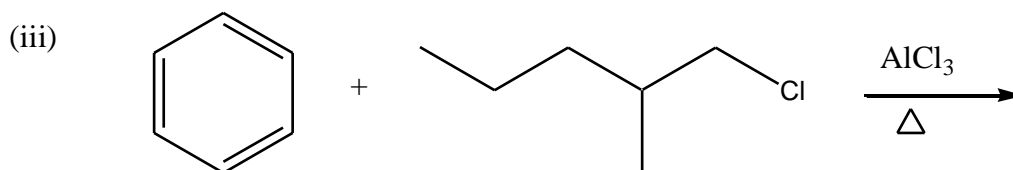
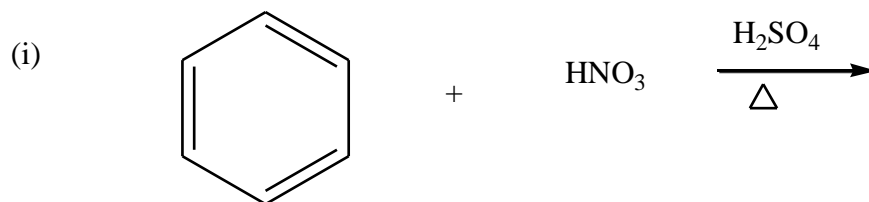
(2marks each 10 total)

b) Classify each of the following compounds as aromatic or antiaromatic. Show how you arrive at your conclusion.



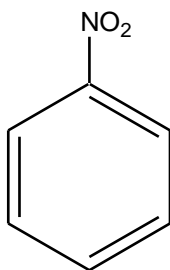
(1mark each, 4total)

c) Complete the following reactions by showing the major product.

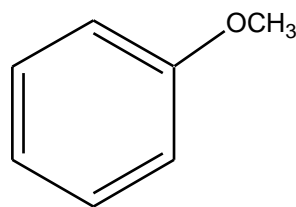


(2marks each, 6total)

d) Account for the difference in reactivity towards electrophiles between the following compounds.

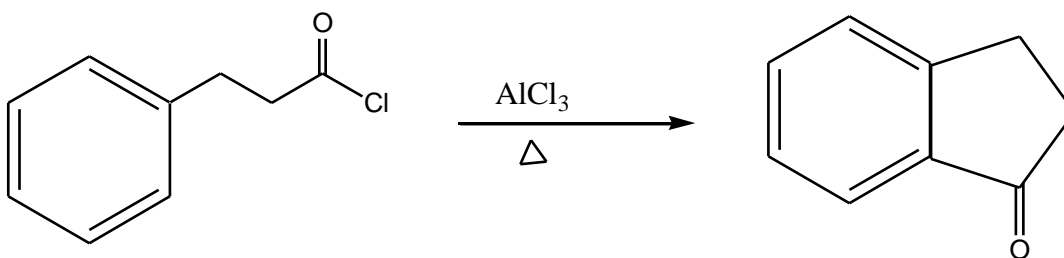


and



(4marks)

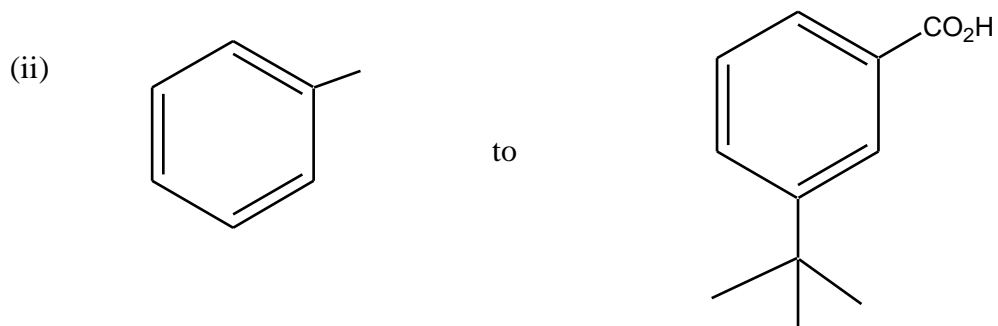
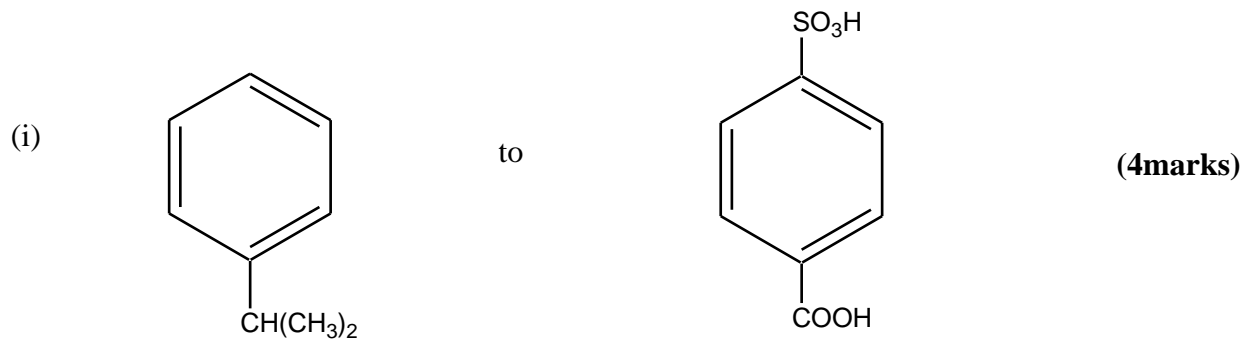
e) Using curly arrows, propose a mechanism for the following reaction



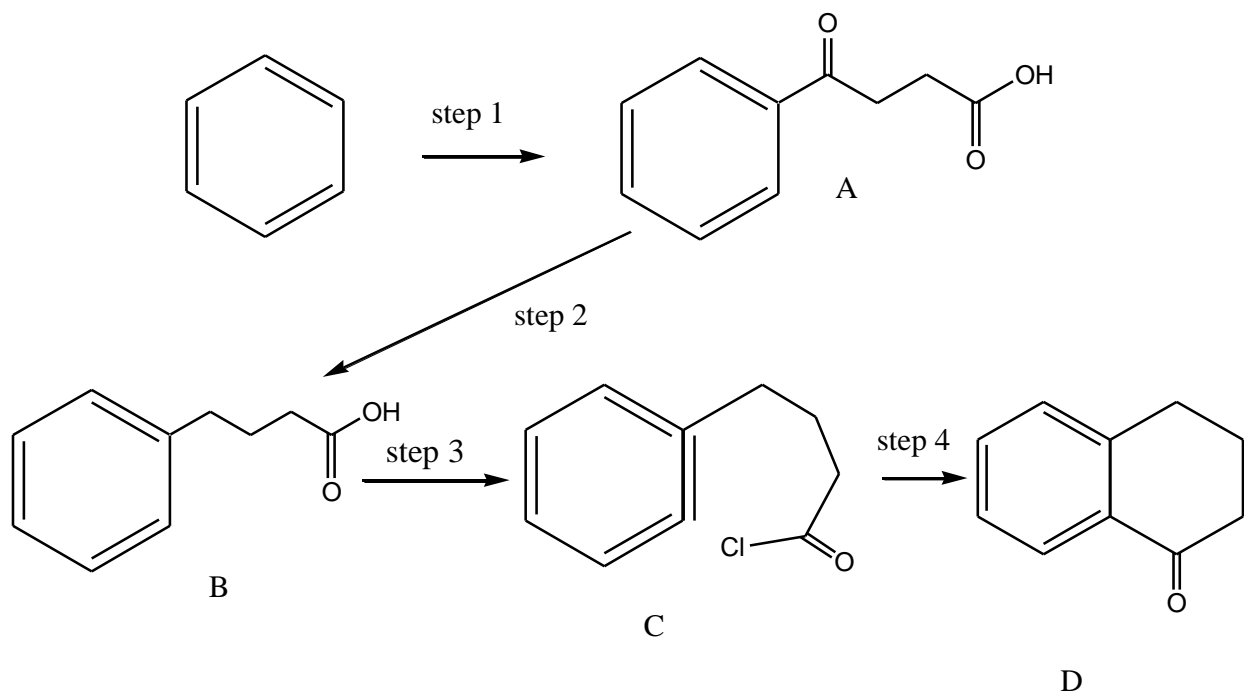
(6marks)

QUESTION TWO

- a) Suggest a suitable series of reaction steps for carrying out each of the following transformations starting from the given compound:



- b) A standard synthetic sequence for building a six-membered cyclic ketone onto an existing aromatic ring is shown in outline as follows:



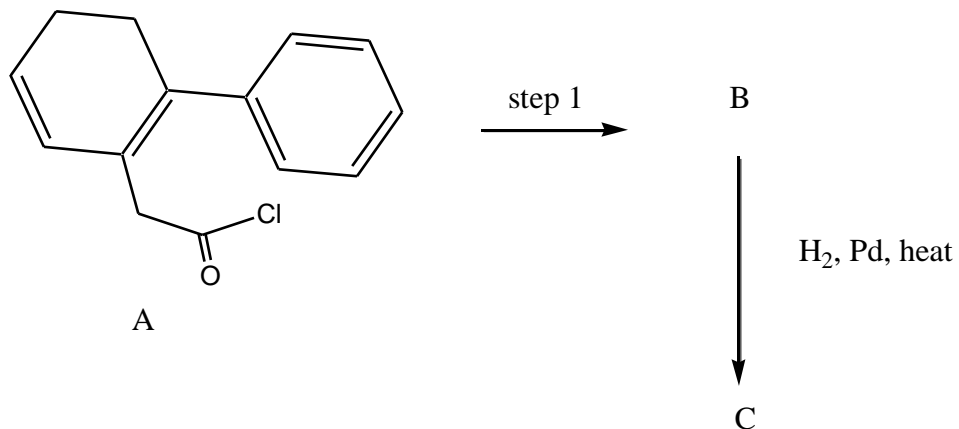
- (i) Suggest the reagents necessary for step 1,2,3 and 4. **(4marks)**
 (ii) Propose a mechanism for the formation of D from C in step 4. **(4marks)**

c) Draw the structure corresponding to the following IUPAC name

- (i) P-nitroaniline **(2marks)**
 (ii) 2-bromonaphthalene **(2marks)**

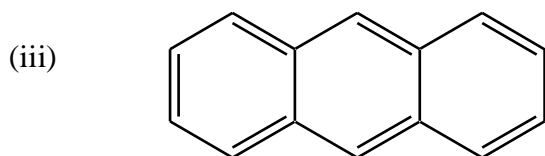
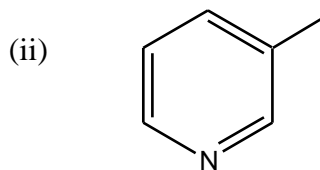
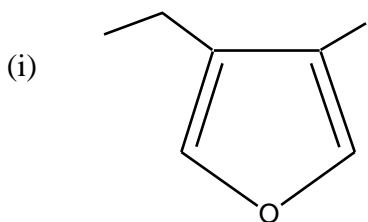
QUESTION THREE

a) Study the reaction scheme below for the formation of C from A



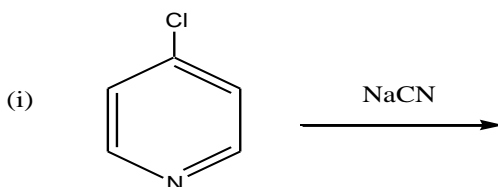
- (i) Name the type of reaction in step 1 and give the reagents needed to get B from A. **(2marks)**
- (ii) Give the structures of products B and C. **(4marks)**
- (iii) Propose using curly arrows a mechanism for the formation of B from A in step 1 above. **(4marks)**

b) Provide the systematic name for each of the following compounds

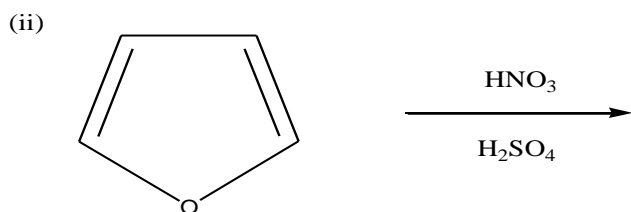


(6marks)

c) Draw the structure of the major product in each of the following reaction :



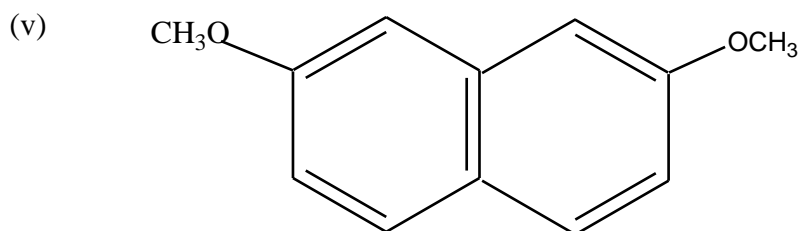
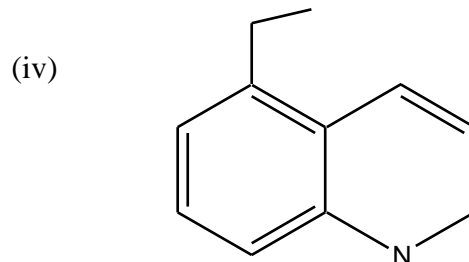
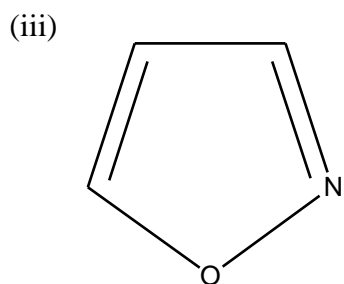
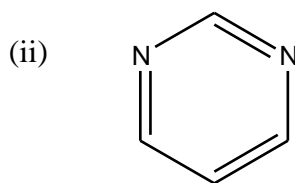
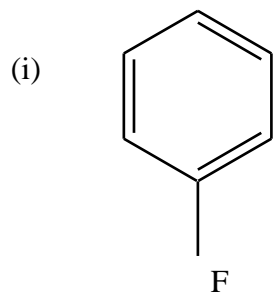
(2marks)



(2marks)

QUESTION FOUR

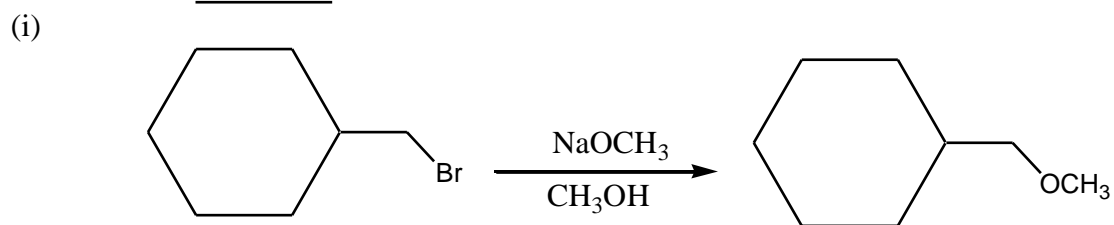
a) Name the following compounds



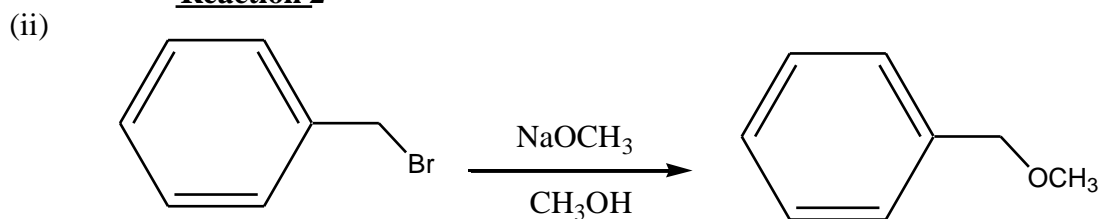
(10marks)

b) Which of the following reactions will have the faster rate and give a better yield of product? Justify your choice.

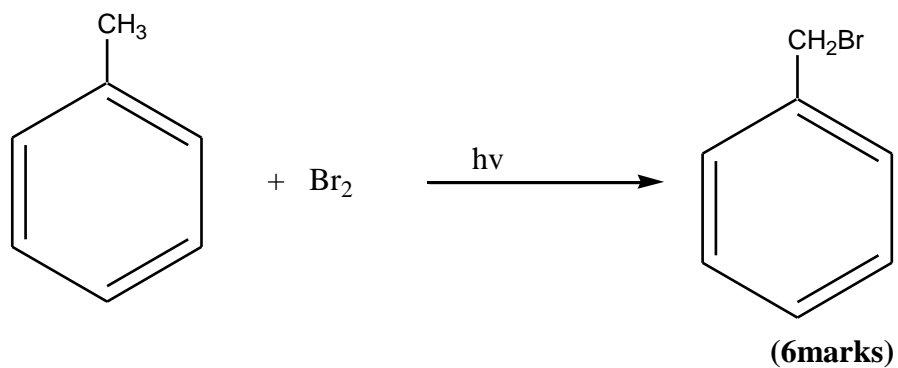
Reaction 1



Reaction 2



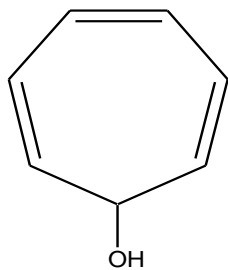
c) Propose using curly arrows, a mechanism for the following reaction.



QUESTION FIVE

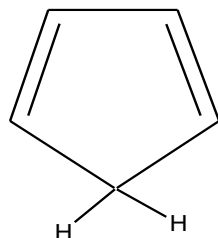
a) How would you convert the following compounds to aromatic compounds?

(i)



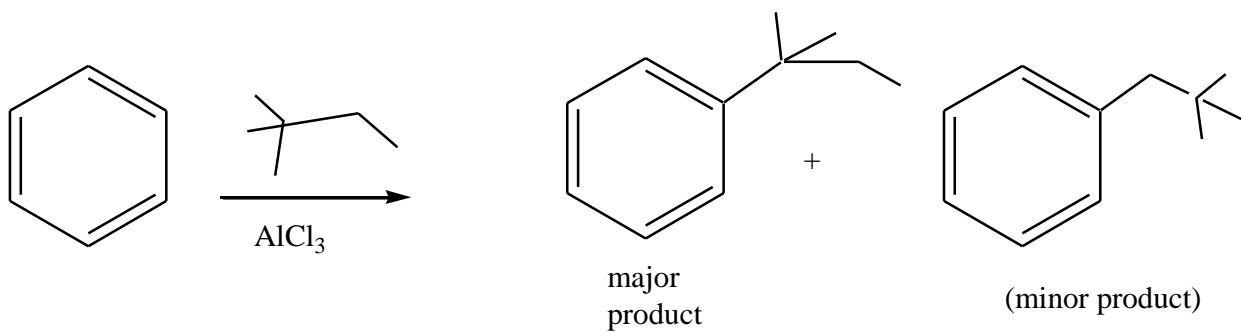
(4marks)

(ii)



(4marks)

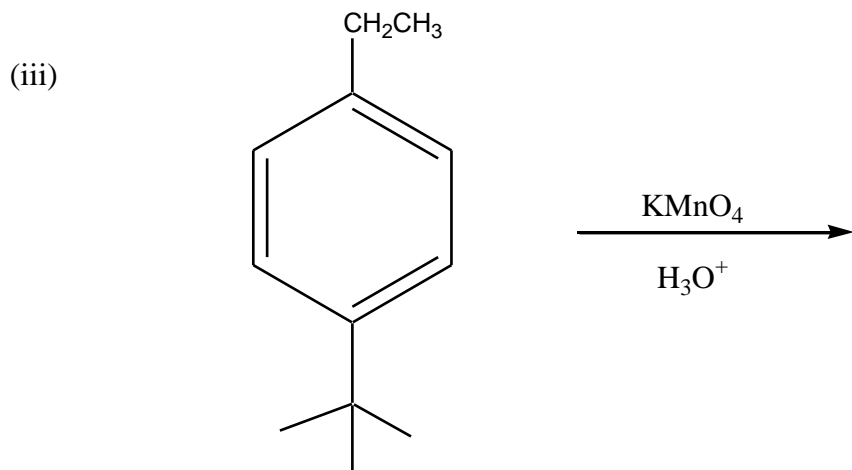
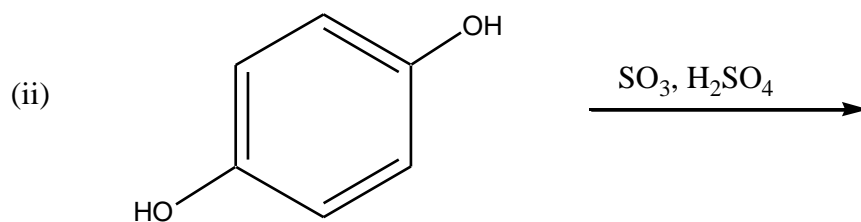
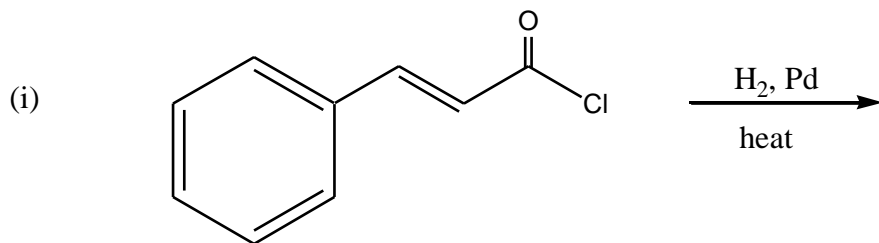
b) Study the reaction below



Propose a mechanism for the formation of the major product.

(6marks)

c) Complete the following reactions by indicating the major product.



(6marks)