



Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF **PURE AND APPLIED SCIENCES**

DIPLOMA IN ANALYTICAL CHEMISTRY

(DAC 11M)

ACH 2207: CHEMISTRY OF AROMATIC COMPOUNDS

SPECIAL/SUPPLEMENTARY: EXAMINATIONS

SERIES: February 2013

TIME: 2 HOURS

INSTRUCTIONS:

You should have the following for this paper

- *Answer booklet*

This paper consists of **FIVE** questions.

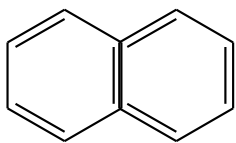
Answer Question **ONE (compulsory)** and any other **TWO** questions

This paper consists of 4 PRINTED pages

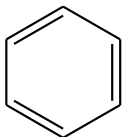
Question ONE

a) Give IUPAC names for the following

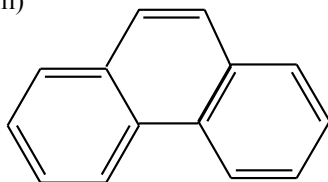
(i)



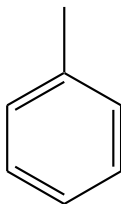
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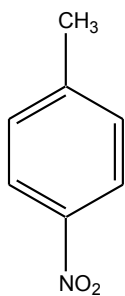
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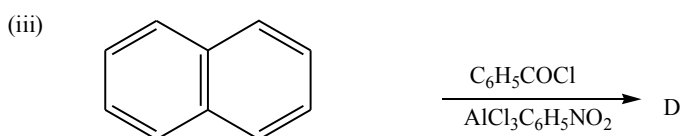
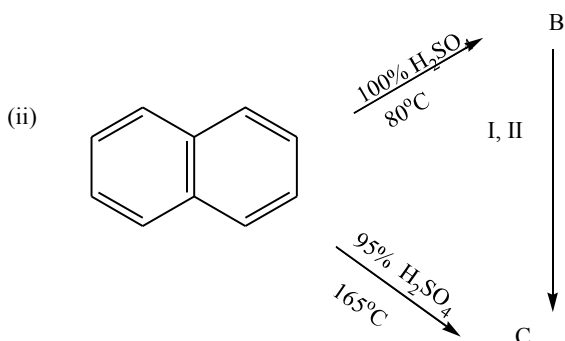
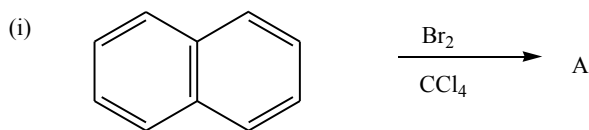
(iv)



(v)



b) Complete the following equations



(iv) The conditions I and II (2marks)

c) Explain the meaning of the following

(i) Electrophile (1mark)

(ii) Nucleophile (1mark)

(iii) Biphenyls (1 ½ marks)

(iv) Friedel crafts Acylation (2marks)

d) (i) Outline the mechanism for (i) Friedelcrafts alylation of benzene using ethanoyl chloride and AlCl_3 at 80°C (6marks)

(ii) Friedel crafts alkylation of Benzene with 2-chloropropane and AlCl_3 as a halogen career.

(6marks)

e) State any TWO applications of benzene derivatives (1mark)

Question TWO

a) Distinguish between activating and deactivating groups (4marks)

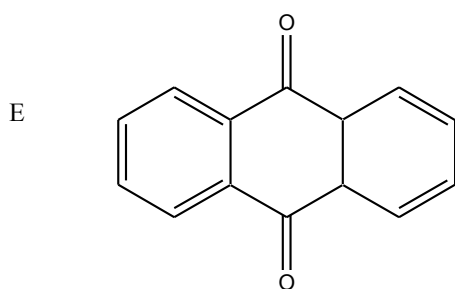
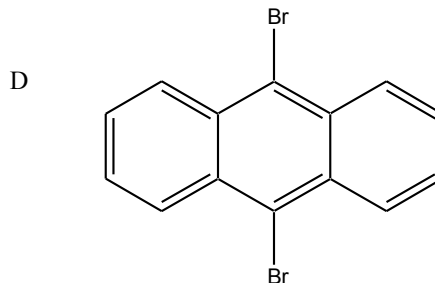
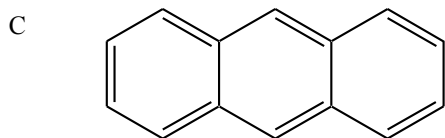
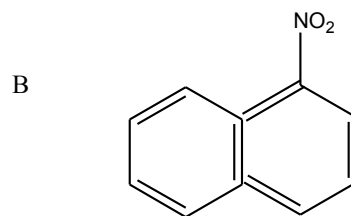
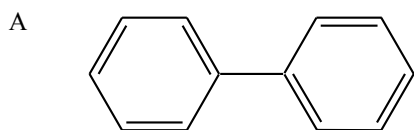
b) Name FOUR activation of groups and arrange then in order of their activating power and explain this order. (4marks)

c) Give reason(s) why benzene is said to be stable. (2marks)

d) Outline TWO physical properties of benzene (1mark)

Question THREE

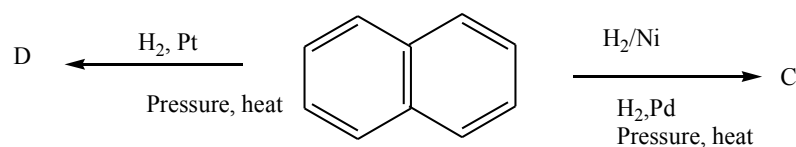
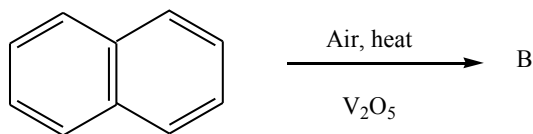
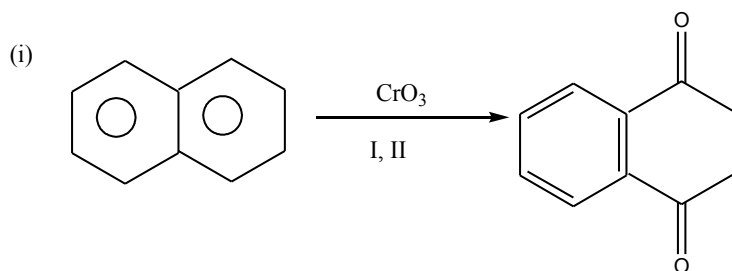
a) Name the following compounds



(5marks)

b) Explain the following

- I. A is more reactive to electrophilic aromatic substitution than benzene. (2marks)
- II. Write equations for the following
 - (i) Bromination of naphthalene in presence of CCl_4 (2marks)
 - (ii) State the other condition required for this reaction (1mark)
- III. (i) Complete the following equations giving the appropriate names



(2marks)

Question FOUR

- a) Outline the limitations of Friedel crafts alkylation and acylation (10marks)
- b) Explain the synthetic applications Friedel-Crafts alkylation (5marks)

Question FIVE

- a) Draw the structures of the following organic compounds (5marks)
- Thiophene
 - Pyridine
 - Pyrole
 - Furan
 - Tetrahydro furan
- b) Write two equations to show the effect of substituent groups in the benzene ring (4marks)
- c) (i) State TWO Lewis acids commonly used in friedel –crafts alkylation (1mark)
- (ii) Describe the general mechanism for electrophilic Aromatic substitution (5marks)