



Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF **PURE AND APPLIED SCIENCES**

DIPLOMA IN ANALYTICAL CHEMISTRY

(DAC 10J)

ACH 2307 : ORGANIC CHEMISTRY III

SPECIAL/SUPPLEMENTARY: EXAMINATIONS

SERIES: FEBRUARY 2013

TIME: 2 HOURS

INSTRUCTIONS:

You should have the following for this paper

- *Answer booklet*

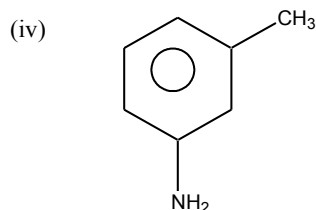
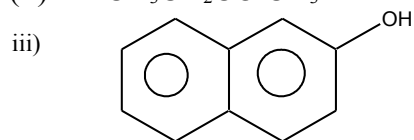
This paper consists of **FIVE** questions.

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

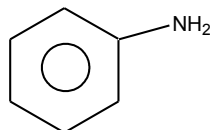
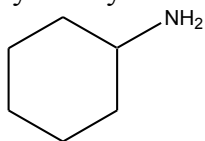
This paper consists of 4 PRINTED pages

Question ONE

a) Name the compounds shown below using IUPAC system



b) Explain why cyclohexylamine is more reactive than aniline towards methyl iodide



(4marks)

c) Draw and name the isomers of $\text{C}_4\text{H}_{10}\text{O}$ that are alcohols

(4marks)

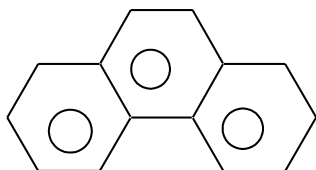
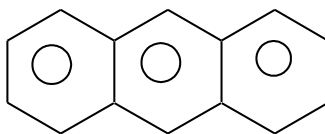
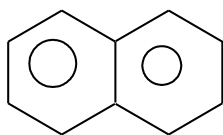
d) (i) Arrange the following in order of decreasing reactivity towards nucleophile addition.
 $(\text{CH}_3)_2\text{C}=\text{O}$, CH_3CHO , $\text{H}_2\text{C}=\text{O}$

(1mark)

(ii) Account for the order in (a) above

(3marks)

e) (i) Name the following compounds

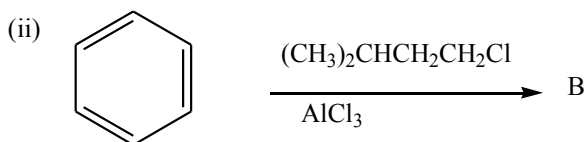
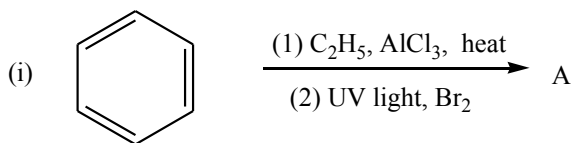


(3marks)

(ii) Explain why Naphthalene is more reactive than benzene.

(4marks)

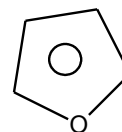
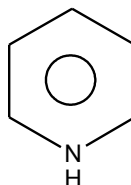
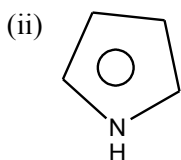
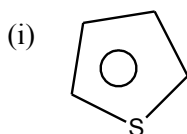
f) Identify with reasons the major products in the following reactions



g) State the meaning of the word electrophile (1mark)

Question TWO

a) Name the following compounds



(4marks)

b) Explain why pyridine behaves like benzene in its reactions (2marks)

c) Describe any TWO tests that can be used to distinguish between aldehydes and ketones.

(6marks)

d) Give the structural formula and IUPAC names of all the isomeric forms of Nitroaniline

(3marks)

Question THREE

a) Define the following of terms

(i) Monomer (1mark)

(ii) Addition polymerization (2marks)

(iii) Condensation polymerization (2marks)

b) Outline any FOUR advantages of synthetic polymers. (4marks)

c) Deduce with reasons the compound expected to have the highest boiling in the following pairs.

(i) $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$ and $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$ (2marks)

(ii) $(\text{CH}_3)_3\text{N}$ and $\text{CH}_3\text{CH}_2\text{NHCH}_3$ (2marks)

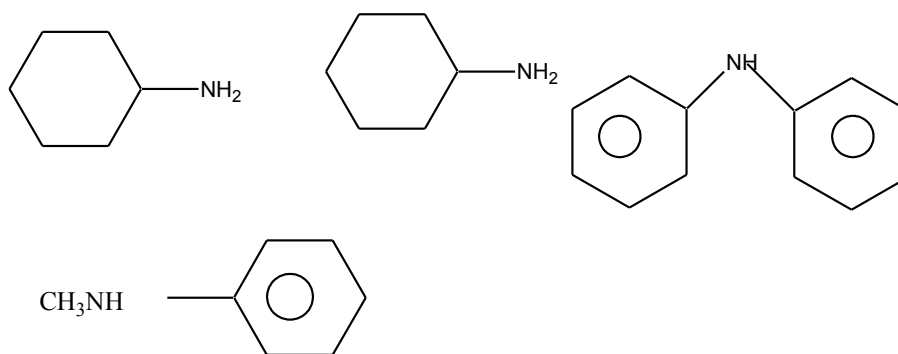
d) Outline TWO applications of alkanes. (2marks)

Question FOUR

a) (i) Draw the structures of the isomers of dichlorobenzene (1 ½ marks)

(ii) Give acceptable names for the isomers in a(i) above (1 ½ marks)

b) Arrange the following dimines in order of increasing basicity. State reason(s)



c) When a cold solution of benzene diazonium of phenol in sodium hydroxide a yellow precipitate is formed.

- Give the structure and name of the compound formed **(2marks)**
- Name the type of reaction in (c) (i) above **($\frac{1}{2}$ mark)**
- State with reasons the feature of the molecular structure responsible for the colour **(2 $\frac{1}{2}$ marks)**

d) The nitration of methyl benzene takes place at a lower temperature that does the nitration of benzene. Explain **(2marks)**

Question FIVE

- Define the following terms
 - Nucleophile **(1mark)**
 - Electrophilic aromatic substitution **(3marks)**
- Describe the general mechanism of electrophilic aromatic substitution **(3marks)**
- Outline a mechanism for the reaction between benzene and 2-diloropropane. **(4marks)**
- Explain how you would distinguish between primary, secondary and tertiary alcohols **(5marks)**