Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF **PURE AND APPLIED SCIENCES**

DIPLOMA IN ANALYTICAL CHEMISTRY
(DAC 12S)

ACH 2207: CHEMISTRY OF AROMATIC COMPOUNDS

SEMESTER: EXAMINATIONS

SERIES: DECEMBER 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 **5 PRINTED** pages*

Question ONE

a) Give the IUPAC names of the following

b) Explain the meaning of the following terms giving examples in each case.

(i) Activating group **(2marks)**

(ii) Deactivating group **(2marks)**

(iii) Ortho – directing **(2marks)**

c) Outline any THREE characteristic features of Aromatic compounds **(6marks)**

d) I. Draw the structures of the following compounds

(i) Naphalene

(ii) Authracene

(iii) Phenanthrene

(iv) 3-Nitronaphthalene

(v) 2-Naphthol

(vi) 1,4 – Naphthoguinone

(vii) Quinone

(7marks)

II. Distinguish between the following

(i) Electrophite and Nucleophile **(2marks)**

(ii) Homolytic and Heterolytic fission **(2marks)**

(iii) Aromatic and Anti-aromatic compound **(2marks)**

Question TWO

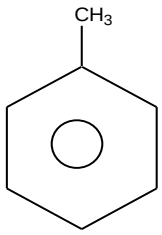
a) Outline any FIVE properties of benzene **(5marks)**

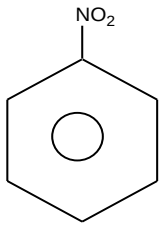
b) (i) State any TWO reagents needed for nitrification of benzene **(1mark)**

(ii) Outline the mechanism for the nitration of benzene. **(5marks)**

(iii) State the role of Conc. H_2SO_4 in the reaction **(1mark)**

c) Which of the two compounds below is move reactive. Give reason(s) for your answer.





Question THREE

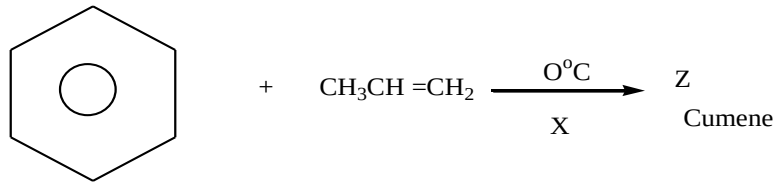
a) Define the following

(i) Fiedel-crafts Alkylation **(1 ½ marks)**

(ii) Lewis acid **(1mark)**

(iii) Acylation **(½ mark)**

b) Complete the following equation by naming X and drawing the structure of Z

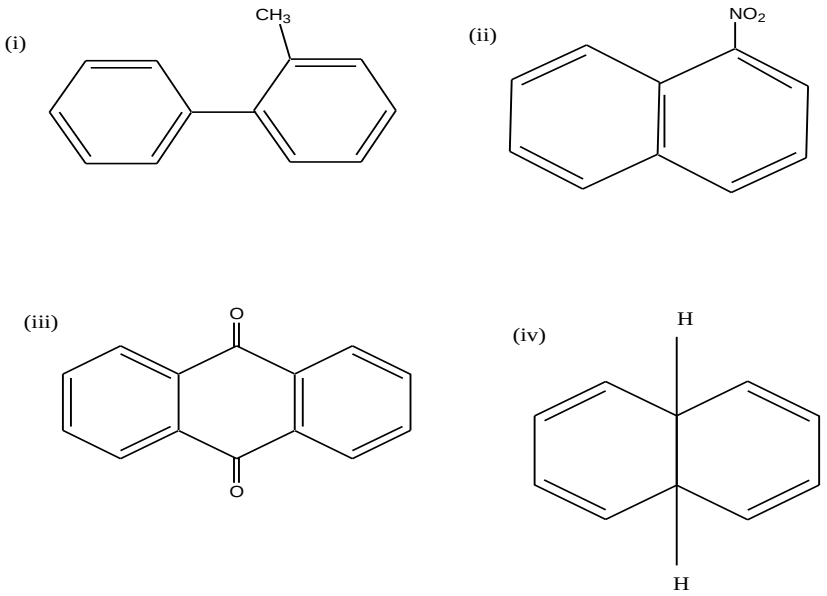


(2marks)

Question FOUR

a) Outline TWO limitations of Friedel crafts alkylation. **(2marks)**

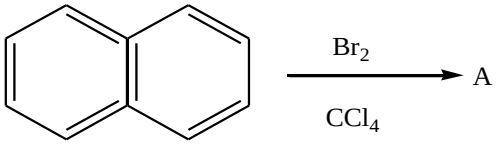
b) Name the following compounds



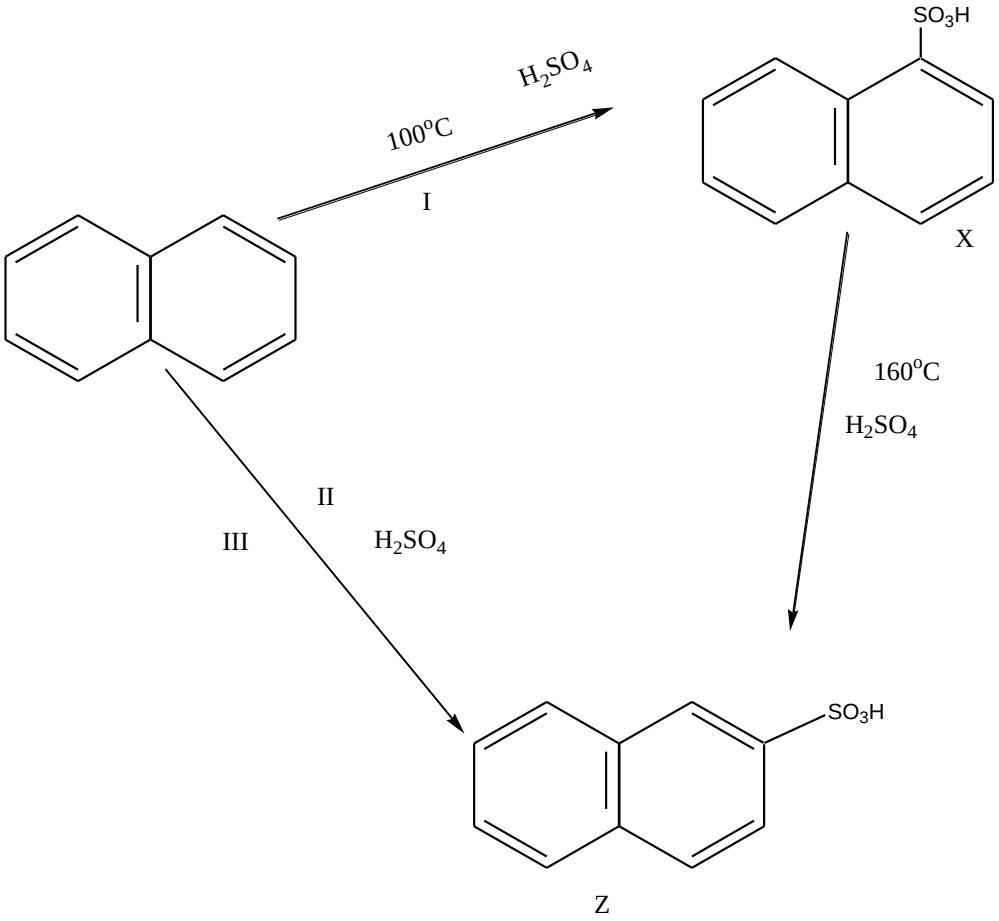
(4marks)

c) Give reason(s) why biphenyl are move reactive than benzene. **(2marks)**

d) Complete the following equations



e) Study the reaction



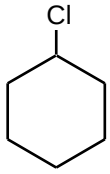
(i) Name the conditions I, II and III **(3marks)**

(ii) Name the resulting compounds X and Z **(3marks)**

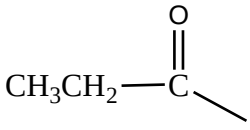
Question FIVE

a) What product is formed when benzene is treated with each organic halide in the presence of $AlCl_3$

(i) $(CH_3)_2CHCl$ **(1mark)**

(ii) 

(1mark)

(iii) 

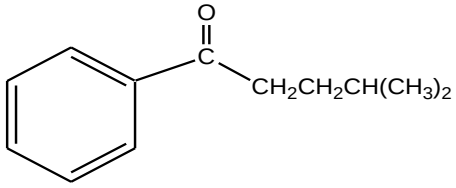
(1mark)

b) Write a mechanism for the product formed in

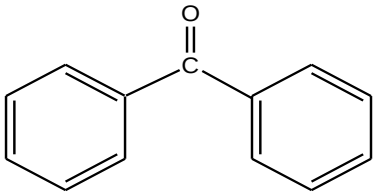
(i) a(i) **(3marks)**

(ii) a(iii) **(3marks)**

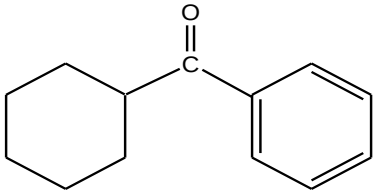
c) What acid chloride would be needed to prepare each of the following ketones from benzene using friedel –crafts acylation

(i) 

(2marks)

(ii) 

(2marks)

(iii) 

(2marks)