



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

**UNIVERSITY EXAMINATION FOR:**

**DIPLOMA IN ANALYTICAL CHEMISTRY**

**DAC 14S**

**ACH 2209: CHEMISTRY OF AROMATIC COMPOUNDS**

**END OF SEMESTER EXAMINATION**

**SERIES: APRIL 2016**

**TIME: 2 HOURS**

**DATE:** Pick Date Select Month Pick Year

## Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

**Do not write on the question paper.**

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## Question ONE

- (a) (i) Draw the five possible structures of benzene  $C_6H_6$ . (5marks)  
(ii) Benzene has m.p.t. of  $6^0c$  while methylbenzene has m.p.t of  $-95^0c$ . Explain. (2marks)
- (b) State and explain the two problems that are associated with Kekulé structure of benzene. (6marks)
- (c) Write electrophilic substitution reaction mechanism of naphthalene. (8marks).
- (d) (i) Phenol is a derivative of benzene but it cannot be made by direct reaction of  $-OH$  on benzene. Explain. (2marks).  
(ii) How can phenol be made from benzene. (7marks).

## Question TWO

- (a) Write the four hybrid contributing resonance structures of anthracene. (4marks)
- (b) (i) State Huckel  $4n+2$  rule of aromatic compounds. (3marks)
- (ii) Name and draw structures of two Phenol derivatives that are used as antiseptics nowadays. (4marks)
- (c) Explain the reason why Phenol
- (i) is no longer used as an antiseptic. (1 marks)
- (ii) is a stronger acid than aliphatic alcohols. (3marks)

## Question THREE

- (a) Explain why phenol is more soluble in NaOH than in water. (6marks)
- (b) How can one distinguish between Benzene and Phenol in the lab using a simple chemical test. (5marks)
- (c) write four resonance structures of naphthalene. (4marks)

## Question FOUR

- (a) Naphthalene is more reactive than benzene towards electrophilic attack. Explain (4marks)
- (b) Write equation for reaction of naphthalene with the following reagents and name the Products.
- (i) ozone and then water. (5marks)
- (ii) Hydrogen in Na/ethanol at 351k. (2marks)
- (c) State 4 uses of naphthalene. (4marks)

## Question FIVE

- (a) Write equations for synthesis of anthracene from benzene and phthalic anhydride using the following reagents. Name the Intermediates and final products.
- (i)  $\text{AlCl}_3/\text{heat}$ ,  $\text{H}_2\text{SO}_4/100^\circ\text{C}$ , then Zn (6marks)
- (b) Explain how dimerisation of anthracene occurs. (7marks)
- (c) Write the names of the two structures of sulphonated products of anthracene (2marks)