



# Technical University of Mombasa

*Faculty of Applied and Health Sciences*

DEPARTMENT OF **PURE AND APPLIED SCIENCES**

DIPLOMA IN ANALYTICAL CHEMISTRY

(DAC 11M)

**ACH 2304: APPLIED ANALYTICAL CHEMISTRY I**

**SPECIAL/SUPPLEMENTARY: EXAMINATIONS**

**SERIES: OCTOBER 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 3 PRINTED pages*

### Question ONE

- a) Why is soft soap more preferred than soap for general cleaning purpose (5marks)
- b) Explain the purpose of adding each of the following ingredients during soap make process. (6marks)
- (i) Sulphur
  - (ii) Linolin
  - (iii) Mercury iodine
  - (iv) Lemon grass oil
- c) State the characteristics of a good quality toilet soap. (4marks)
- d) (i) Differentiate between polar and non-polar compounds. (5marks)
- (ii) Give TWO examples of each compounds

### Question TWO

- a) List FIVE factors that are considered during cleansing action of soap. (5marks)
- b) (i) Show how alkyl benzene sulphate may be prepared from alkyl benzene
- (ii) Write equations for all side reactions (20 rxns) that take place during its preparation. (7marks)
- c) Explain the WELSH process for preparation of alcohol from olefin (8marks)

### Question THREE

- a) Complete the following equations giving the products (8marks)
- (i)  $\text{RNH}_2 + 3\text{CH}_3\text{Cl} \rightleftharpoons$
  - (ii)  $\text{R}_2\text{NH} + 2\text{CH}_3\text{Cl} \rightleftharpoons$
  - (iii)  $\text{N}(\text{CH}_3)_3 + \text{CH}_3\text{CH}_2\text{Cl} \rightleftharpoons$
  - (iv)  $\text{C}_{12}\text{H}_{25}\text{Cl} + \text{N}(\text{CH}_3)_3 \rightleftharpoons$
- b) State (2marks)
- (i) Two main functions of a shampoo. (2marks)
  - (ii) Two requirements of a good shampoo. (2marks)
- c) State the use of each of the following during shampoo manufacturing process. (8marks)
- (i) Na Toluene sulphate
  - (ii) Disodium salt of EDTA
  - (iii) Formaldehyde
  - (iv) Propylene stearate
  - (v) Lemon Juice
  - (vi) Zn Pynithione
  - (vii) Egg albumin
  - (viii) Amine oxide

### Question FOUR

- a) Define cosmetic (2marks)

- b) Explain the TWO ways of manufacturing mascara **(8marks)**
- c) Explain the lipstick manufacturing process. **(6marks)**
- d) Give a reason why mercury compounds are restricted by regulation in the manufacture of cosmetics. **(4marks)**

**Question FIVE**

- a) Explain the meaning of the following
  - (i) BOD (Biochemical oxygen demand)
  - (ii) COD chemical oxygen demand **(4marks)**
- b) State TWO uses of COD during waste water treatment process **(2marks)**
- c) Give a brief account of both Anaerobic process and Aerobic process that occurs during decomposition of organic matter **(10marks)**
- d) Name the three types of Biodegradable organic matter that is found in municipal waste water. **(4marks)**