# Technical University of Mombasa

***Faculty of Applied and Health Sciences***

DEPARTMENT OF **PURE AND APPLIED SCIENCES**

DIPLOMA IN ANALYTICAL CHEMISTRY
(DAC 12S)

## ACH 2211 : PHOTOGRAPHY, CRYOGENIC, GLASS BLOWING & VACUUM

**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 **3 PRINTED** pages*

**Question ONE**

(a) (i) Explain vacua **(2marks)**

(ii) By using pressure speed graphs show the following

I. Rotary vane pumps (single stage **(2marks)**

II. Rotary vane pumps (two stage **(2marks)**

III. Root (blower) pump **(2marks)**

IV. Diffusion pumps **(2marks)**

(b) (i) Draw a line charts representation of vacua indicate the pressure range of each **(5marks)**

(ii) Explain pump connections **(5marks)**

(c) (i) Mention different types of glass **(5marks)**

(ii) Explain working principles of hot cathode gauge **(5marks)**

**Question TWO**

(a) Name the gauge and all parts labelled on the gange given below parts a, b, c, d, e, f, g, l , s, w, n **(10marks)**

(b) Describe methods to detect leakage **(10marks)**

**Question THREE**

(a) Describe different things needed to make a vacuum **(10marks)**

(b) Write in full

(i) MFP, and explain what it means **(6marks)**

(ii) Explain throughout and pump down time **(4marks)**

**Question FOUR**

a) Draw well labelled diagram of Bourdon gauge. **(8marks)**

b) Describe the working principle of Bourdon gauge **(12marks)**

**Question FIVE**

a) Explain why rotary sliding vane pump work in oil **(3marks)**

b) (i) Draw a well labelled block diagram incorporating diffusion pump. **(7marks)**

(ii) Name two types of commonly used diffusion pumps **(2marks)**

(iii) Outline errors commonly encountered in glass manometer gauge **(8marks)**