



Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF **PURE AND APPLIED SCIENCES**

DIPLOMA IN ANALYTICAL CHEMISTRY

(DAC 10J)

ACH 2302: PHOTOGRAPHY, CRYOGENIC, GLASS BLOWING VACUUM

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

Question ONE

- (i) a) State the FIVE classes of vacua and give their approximate ranges. **(5marks)**
b) Explain FIVE properties of gases considered when making a vacuum. **(5marks)**
- (ii) a) Define leak rate in a vacuum system **(4marks)**
b) Explain the working principles of liquid column ganges. **(6marks)**
- (iii) Explain the following
a) Pump down time **(2 ½ marks)**
b) Through-put **(2 ½ marks)**
- (iv) Explain TWO advantages and TWO disadvantages of mercury over oil as pump fluids. **(5 marks)**

Question TWO

- a) Draw a labeled diagram of a pirani gauge and describe briefly how it is used to measure pressure. **(10 marks)**
- b) Give an account of gas ballasting in pressure pumps **(5 marks)**

Question THREE

- a) With the aid of labeled sketches, describe and differentiate between a fractionating and a non – fractionating diffusion pump. **(11 marks)**
- b) Explain the sensitivity of the quadratic scale is McLeod gange. **(4 marks)**

Question FOUR

- a) Discuss procedures used in cleaning up of vacuum system. **(12 marks)**
- b) Write in full and explain the concept of MFP **(3 marks)**

Question FIVE

Discuss the working principle of McLeod gauge. **(15 marks)**