



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN ANALYTICAL CHEMISTRY

DAC 14S

ACH2303 : VACUUM AND GLASS BLOWING TECHNOLOGY

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 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.

Question ONE

- (a) Describe the following types of vacuum. (i) *Low* (ii) *Medium* (iii) *High* (9marks)
- (b) List EIGHT examples of *finishing operations* that are done on newly made glass products. (8marks)
- (c) State FOUR properties of glass that make it have very many uses. (8marks)
- (d) Explain TWO operations that are involved in glass *annealing* process. (5marks)

Question TWO

- (a) (i) State TWO important sources of *lime (CaO)* that is used in glass making. (3marks)
- (ii) How is *MgO* introduced into the Batch during glass making. (2marks)
- (b) State the *color* that is imparted by the following oxides in glass.

- (i) Mixture of NiO and CoO . (ii) SeO . (iii) Fe_2O_3 . (iv) CoO . (4marks)
- (c) List and state the use of THREE furnaces that are used in annealing of glass. (6marks)

Question THREE

- (a) FIVE tools that are used for glass blowing. (5marks)
- (b) State the properties of *Borax* that is used in glass marking. (10marks)

Question FOUR

- (a) List THREE compounds that are used for *removing bubbles* during glass making. (3marks)
- (b) State the properties of the following type of glasses:
- (i) *Fused Silica*. (ii) *Lead*. (iii) *Borosilicate*. (12marks)

Question FIVE

- (a) Define (i) *Pressure*. (ii) *Vacuum*. (iii) *Full vacuum*. (5marks)
- (b) State the SI units of (i) *Pressure*. (ii) *Vacuum*. (4marks)
- (c) Explain the creation process of *Torrillian vacuum*. (3marks)
- (d) Write equation for thermal decomposition of the following compounds and name the product.
- (i) $Ca(HCO_3)_2$ (ii) $Mg(HCO_3)_2$. (3marks)