



TECHNICAL UNIVERSITY

OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE AND APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

BACHELOR OF TECHNOLOGY IN APPLIED CHEMISTRY (INDUSTRIAL AND ANALYTICAL OPTION)

BTAC 15S SEPT 2015

ACH 4103

INTRODUCTION TO INDUSTRIAL CHEMISTRY

END OF SEMESTER EXAMINATION

SERIES:

TIME:2 HOURS

DATE:

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 question

Do not write on the question paper.

Paper Two

Question one

A. Draw a simple flow- sheet for a three effect evaporator with a parallel feed system **4 Marks**

B. Discus :-

i. properties of solution which should be consider when designing Evaporator **6 Marks**

ii. factors which influences the rate of Drying **3 marks**

B. [outline different methods of assessing Mixing Effectiveness](#)

4 marks

- C. Organic compound distil in steam at 99 ° C and external pressure of 760 mmHg and produce distillate containing 20% by mass of organic compound. Calculate RMM of organic compound ven vapour pressure of water as 733mmHg. **4 marks**
- D. With the help of equation outline two laboratory method of hydrogen peroxide **5 mark**
- E. Define (a) Vapour pressure (b) Bound water **4 marks**

Question two

- A. With the help of a diagram briefly describe the working of falling film Evaporator **6 marks**
- B. State Rittingers law as used in size reduction **3 marks**
- C. Sketch a well label diagram of a distiller with rectification and stripping **3 marks**
- D. Differentiate between propeller and paddles **4marks**
- E. Discuss briefly different role of industrial chemist **4marks**

QUESTION THREE

- A. State purpose of:-
 i. Size Reduction
 ii. Agitation **6 marks**
- B. Outline :-
 i. limitation of cooling crystallization **4 marks**
 ii. different classes of unit operations **4 marks**
- C. With the help of a diagram Describe the working of **Thickeners** **6 marks**

QUESTION FOUR

- A. **With the help of equation State Crushing efficiency as used in size reduction** **2 Marks**
- B. Differentiate between
 i. circulation evaporation and double effect evaporation **4 marks**
 ii. Continuous filtration and discontinuous filtration **4 marks**
- C. Sketch a diagram and describe the working of
 i. Centrifugal filter **5marks**
 ii. steam distillation unit **5 marks**

QUESTION FIVE

- A. With the help of a diagram briefly describe the working of
 i. Tray dryer **5 marks**
 ii. Tumbling mills **4 marks**
- B. Define the following terms:-
 i. Sedimentation
 ii. Boiling point
 iii. Entrainment **6 marks**
- C. Discuss any five factors which should be considered when a selecting a plant site **5 marks**