



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

BTMB

ABT4304 : BIOREACTORS- PAPER TWO

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) Name any four types of submerged bioreactors (2 marks)
- b) Highlight any four basic points of consideration while designing a fermenter (4 marks)
- c) Outline the requirements in sparger adequate for good performance (4 marks)
- d) Explain the function of the neutralizing agents in bioreactors (5 marks)
- e) Give the pros and cons of using batch systems (5 marks)
- f) Differentiate between
 - (i) Continuous operations and Semi-continuous fermentations (2 marks)
 - (ii) Batch operations and fed batch operations (2 marks)
 - (iii) Bubble column reactors and air lift reactors (2 marks)
- g) State four factors affecting oxygen transfer during fermentation (4 marks)

Question TWO

- (i) Discuss Airlift Bioreactors (14 marks)
- (ii) Describe types of semi continuous fermentations (6 marks)

Question THREE

Discuss Stirred tank bioreactors (20 marks)

Question FOUR

- i) Discuss the considerations that improve productivity of bioreactor (12 marks)
- ii) Discuss the disposable bioreactor (8 marks)

Question FIVE

- (i) Discuss the air sterilization system (15 marks)
- (ii) Describe the effects of impeller speed (5 marks)