



# TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

BACHELOR OF TECHNOLOGY IN INDUSTRIAL MICROBIOLOGY &  
BIOTECHNOLOGY

ABT 4203: MICROBIAL PHYSIOLOGY

END OF SEMESTER EXAMINATION

**SERIES:** 2016

**TIME:** 2 HOURS

**DATE:** Pick Date Dec 2016

## 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) Differentiate between:-
- i) Obligate chemolithotrophs and facultative chemolithotrophs. (2 marks)
  - ii) Substrate level phosphorylation and oxidative phosphorylation. (2 marks)
  - iii) Nitrifying bacteria and nitrogen fixing bacteria (2 marks)
  - iv) Homolactic and heterolactic fermentation (2 marks)
- b) Describe fermentation of pyruvate in microorganisms. (5 marks)
- c) Name FOUR biosynthetic intermediates generated in the TCA cycle. (4 marks)
- d) List the THREE classes of the component biomolecules of the ETC. (2 marks)
- e) Define the following:-
- i) Anapleurotic reactions (1 mark)
  - ii) Reverse electron transfer (1 mark)

- f) State the THREE enzymes that are replaced in the TCA cycle by the reductive TCA cycle (3 marks)
- g) Outline FOUR characteristics of enzymes (2 marks)

**Question TWO**

- (a) Using illustrations, describe the Entner Duodoroff pathways in microorganisms. (10 marks)
- (b) Discuss classification of micro-organisms with respect to their oxygen requirement. (10 marks)

**Question THREE**

- (a) Discuss the process of cyclic and non-cyclic photophosphorylation in cyanobacteria. (10 marks)
- (b) Describe the bacterial growth curve and the attendant morphological and physiological alterations. (10 marks)

**Question FOUR**

Discuss bacterial growth culture media. (20 marks)

**Question FIVE**

Discuss primary and secondary metabolites in microorganisms. (20 marks)