



# 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) Chemoorganotrophs and chemolithotrophs            | (2 marks) |
| ii) Oxygenic and anoxygenic photosynthesis           | (2 marks) |
| iii) Nitrification and denitrification               | (2 marks) |
| iv) Facultative anaerobes and aerotolerant anaerobes | (2 marks) |

b) Name TWO sources and THREE fates of pyruvate in microbial metabolism.

(5 marks)

c) Name the end products of the Entner Doudoroff pathways in microorganisms. (2 marks)

d) Name the reductive TCA cycle enzymes that replace the following TCA cycle enzymes:-

- |                                 |          |
|---------------------------------|----------|
| i) Succinate dehydrogenase      | (1 mark) |
| ii) Ketoglutarate dehydrogenase | (1 mark) |

- iii) Citrate synthase (1 marks)
- e) Define the following:-
- i) Methanogenesis (1 mark)
  - ii) Chlorosome (1 mark)
- f) Name TWO key intermediates in the hydroxypropionate pathway. (2 marks)
- g) State FOUR classes of enzymes (2 marks)
- h) Giving examples, distinguish between primary and secondary metabolites in microorganisms. (4 marks)

### Question TWO

- (a) Using illustrations, describe the oxidative phase of the Hexose Monophosphate pathway. (10 marks)
- (b) Discuss the methods used by microorganisms to take up nutrients. (10 marks)

### Question THREE

Discuss microbial growth requirements. (20 marks)

### Question FOUR

- (a) Describe the methods used in measuring microbial growth. (10 marks)
- (b) Illustrate the relationship between carbohydrate, fat and protein catabolism. (20 marks)

### Question FIVE

Discuss the energy classes of microorganisms. (20 marks)