



# Technical University of Mombasa

Faculty of Applied and Health Sciences

**DEPARTMENT OF PURE AND APPLIED SCIENCES**

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF  
TECHNOLOGY IN INDUSTRIAL MICROBIOLOGY AND BIOTECHNOLOGY  
**BTMBT 12S**

**AAB 4203: MICROBIAL PHYSIOLOGY**

SEMESTER EXAMINATION

DECEMBER 2013 SERIES

2 HOURS

Instructions to candidates:

This paper consist of **FIVE** questions

Answer question **ONE** (compulsory) and any other **TWO** questions

## QUESTION ONE

- a) Define the following terms; chemoautotrophs and photometerotrophs. Give examples of each. **(4marks)**
- b) Explain the role of lipids in cell physiology **(3marks)**
- c) Differentiate between catabolic reactions and anabolic reactions **(4marks)**
- d) Explain enzyme specificity and efficiency. **(5marks)**
- e) Describe the process of Amino acid and protein biosynthesis **(6marks)**
- f) Distinguish between different types of respiration. **(4marks)**
- g) Explain feedback inhibition concept. **(4marks)**

## QUESTION TWO

- a) Define ribozyme and explain how they work. **(6marks)**
- b) Describe the chemical reactions of glycolysis **(10marks)**
- c) Discuss the net ATP output in glycolysis and any other beneficial product. **(4marks)**

## QUESTION THREE

- a) Outline how microorganisms synthesize polysaccharides with special reference to glycogen and peptidoglycan. **(10marks)**
- b) Determine how much ATP could be obtained;
  - (i) From the complete oxidation of one molecule of glucose. Account. **(4marks)**
  - (ii) Explain how a molecule of butterfat containing one glycerol and three 12 carbon chains fatty acids is oxidized. **(6marks)**

## QUESTION FOUR

Discuss the electric transport chain (system) under the following headlines:

- (i) Site it take place in prokaryotic cells **(1mark)**
- (ii) Carriers classes and molecules **(9marks)**
- (iii) The mechanism of chemiosmotic ATP generation. **(10marks)**

## QUESTION FIVE

- a) Define anaerobic respiration **(2marks)**
- b) Distinguish Lactic fermentation from Alcohol fermentation and give relevant applications. **(18marks)**