



# 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 12J

### AAB 4206: MICROBIAL GENETICS

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 terminologies in the context of microbial genetics
- (i) Transposable element
  - (ii) Pyrimidine dimmers
  - (iii) Genetic recombination
  - (iv) Degenerate code
  - (v) Transduction
- (5 marks)**
- b) Briefly discuss the operon and its components as a unit of gene expression **(5 marks)**
- c) Enlist the properties that make plasmids important cloning vectors **(5 marks)**
- d) Describe nonsense mutation **(5 marks)**

e) Discuss the mechanisms of transposition (5 marks)

f) With examples, explain codon bias (5 marks)

## QUESTION TWO

a) Explain the role played by R plasmids in traditional antibiotic therapies (10 marks)

b) Describe how enteropathogenic *Escherichia coli* attain virulence to cause diarrhea (10 marks)

## QUESTION THREE

Discuss molecular basis of mutation with regard to:-

a) DNA repair (10 marks)

b) Base pair substitution (10 marks)

## QUESTION FOUR

a) Explain the mode of action of nucleotide base analogs as chemical mutagens (10 marks)

b) Discuss the role of ionized radiation in mutagenesis (10 marks)

## QUESTION FIVE

a) Discuss specialized transduction as a mechanism of genetic exchange (10 marks)

b) Describe how transformation aids DNA uptake during genetic exchange (10 marks)