



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
SBT 2415: MICROBIAL GENETICS
SPECIAL/SUPPLEMENTARY EXAMINATION

October 2013 SERIES

2 HOURS

Instructions to candidates:

This paper consist of **FIVE** questions

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

Question ONE

(a) Define the following terms :

(i) Conjugation

(ii) Transversion

(iii) Suppressor mutation

(iv) Transcription

(v) Transduction

(5marks)

(b) Discuss insertion sequence as a transposable element

(5marks)

(c) Describe the THREE main steps involved in the central dogma of molecular biology.

(5marks)

(d) Describe THREE possible consequences of frame shift mutations

(5marks)

- (e) Explain how *Deinococcus radiodurans* is capable of survival in environments contaminated by radioactive materials **(5marks)**
- (f) Enlist the major steps of cloning with lambda replacement vectors **(5marks)**

Question TWO

Discuss the molecular basis of mutation with regard to:

- (i) Base pair substitution **(10marks)**
- (ii) DNA repair **(10marks)**

Question THREE

- (a) With examples, explain the mode of action of nucleotide based analogues as chemical mutagens **(15marks)**
- (b) Describe codon biasness **(5marks)**

Question FOUR

- (a) Discuss site-directed mutagenesis as a molecular biology tool **(10marks)**
- (b) Discuss the mechanism of DNA transfer during conjugation **(10marks)**

Question FIVE

- (a) Explain the role of transposition in microbial evolution **(10marks)**
- (b) Discuss the role of radiation in mutagenesis **(10marks)**