



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

## UNIVERSITY EXAMINATION FOR:

BACHELOR IN INDUSTRIAL MICROBIOLOGY AND BIOTECHNOLOGY

AAB 4206: MICROBIAL GENETICS PAPER II

SPECIAL SUPPLEMENTARY EXAMINATION

**SERIES:** SEPT. 2017

**TIME:** 2 HOURS

**DATE:** SEPT. 2017

### 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.**

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### Question ONE

- Outline any TEN differences between DNA and RNA (5 marks)
- Using a suitable diagram, describe the mechanism of natural transformation in bacteria (8 marks)
- State any FIVE significance of crossing over (5 marks)
- Outline the importance of transposable elements (6 marks)
- Describe the processes involved in the regulation of chromatin structure (6 marks)

### Question TWO

- Describe the FOUR types of mutation suppressors (8 marks)
- Describe the following mutagens
  - Radiation (6 marks)

ii) Temperature (2 marks)

iii) Intercalating agents (4 marks)

(c) **Question THREE**

(a) Using a suitable example, describe the production of recombinants by means of independent assortment

(6 marks)

(b) Explain the EIGHT factors that affect the frequency of crossing over (8 marks)

(c) Describe the functions of the three types of RNA (6 marks)

**Question FOUR**

(a) Using appropriate diagram describe the base excision mechanism of DNA mutation repair in a cell (6

marks)

(b) With an aid of a suitable diagram outline the steps involved in a lysogenic bacteriophage infection (8

marks)

(c) Describe the THREE types of *E. coli* plasmids (6 marks)

**Question FIVE**

Describe;

(a) the process of transposition of insertion sequences into the target DNA (10 marks)

(b) the post-transcriptional gene regulation in eukaryotes (10 marks)