



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

**FOURTH YEAR SUPPLEMENTARY/SPECIAL EXAMINATION FOR
BACHELOR OF SCIENCE IN BIOLOGY**

SBT 418: MICROBIAL GENETICS

DATE: 6/3/2023

TIME : 2.00 – 4.00 PM

INSTRUCTIONS

1. Answer Question 1 (compulsory) and **any two** questions
2. Use clean well labelled diagrams wherever appropriate.

QUESTION ONE (30 MARKS)

- | | | |
|----|---|---------|
| a) | Briefly describe the replica plate method of testing for successful mutants | (3 mks) |
| b) | Explain the antiparallel nature of a DNA double helix | (3 mks) |
| c) | Illustrate the synthesis of cDNA from a mRNA template | (3 mks) |
| d) | Outline three causes of induced mutations | (3 mks) |
| e) | Explain three ways of making a bacterial cell competent for transformation | (3 mks) |
| f) | Briefly explain the role of the F factor plasmid in bacteria | (3 mks) |
| g) | Explain three types of point mutations | (3 mks) |
| h) | Illustrate phosphodiester linkage in DNA | (3 mks) |
| i) | Distinguish between | |
| j) | Purines and pyrimidines | (3 mks) |
| k) | Nucleotides and nucleosides | (3 mks) |
| l) | DNA and RNA | (3 mks) |

QUESTION TWO (20 MARKS)

Discuss the process of gene expression

QUESTION THREE (20 MARKS)

Discuss the semi-conservative DNA replication

QUESTION FOUR (20 MARKS)

Discuss the regulation of prokaryotic gene expression

QUESTION FIVE (20 MARKS)

Discuss the concept of biofilm formation

(10 mks)

Discuss the transfer of genetic material through transduction

(10 mks)