MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN BIOLOGY

SBT 418: MICROBIAL GENETICS

DATE: 14/3/2022 **TIME : 8:30 – 10:30 AM**

INSTRUCTIONS

1. Anwer Question 1 (compulsory) and **any two** questions in Section B.
2. Use clean well labelled diagrams wherever appropriate.

SECTION A

QUESTION ONE (30 MARKS)

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

SECTION B

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)

a) Discuss the concept of biofilm formation (10 marks)

b) Discuss the transfer of genetic material through transduction (10 marks)