



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (BIOLOGY)

SBT 418: MICROBIAL GENETICS

DATE: 23/10/2020

TIME: 2:00 – 4:00 PM

INSTRUCTIONS

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

SECTION A: COMPULSORY

QUESTION ONE (30 MARKS)

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

SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)

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)