



MACHAKOS UNIVERSITY

University Examinations 2019/2020 academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN BIOLOGY

SBT 418: MICROBIAL GENETICS

DATE:

TIME:

INSTRUCTIONS

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

SECTION A

QUESTION ONE (30 MARKS)

- a) Distinguish between the following terms
 - i. Nucleotide and nucleoside (2 marks)
 - ii. Transformation and transduction (2 marks)
- b) Outline three structural differences between DNA and RNA (3 marks)
- c) Outline the roles of DNA polymerase I and DNA polymerase III (2 marks)
- d) Describe the roles of plasmids in the transfer of genetic information (3 marks)
- e) Explain two ways of making a cell competent (3 marks)
- f) Explain the significance of quorum sensing (3 marks)
- g) Illustrate a replicating double stranded DNA molecule (3 marks)
- h) Describe the formation of phosphodiester bond during DNA synthesis (3 marks)
- i) Explain three types of point mutations (3 marks)
- j) Explain why a DNA double helix is anti parallel (3 marks)

SECTION B

QUESTION TWO (20 MARKS)

Discuss the semi conservative nature of DNA replication

QUESTION THREE (20 MARKS)

- a) Discuss two ways in which successful mutations can be checked (10 marks)
- b) Discuss five causes of induced mutations (10 marks)

QUESTION FOUR (20 MARKS)

Discuss the regulation of bacterial gene expression

QUESTION FIVE (20 MARKS)

- a) Discuss with illustrations the process of gene expression (15 marks)
- b) Differentiate between eukaryotic and prokaryotic gene expression (5 marks)