MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

THIRD YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (BIOLOGY)

SZL 303: ESSENTIALS OF MOLECULAR BIOLOGY

DATE: 11/11/2020 **TIME: 8:30 – 10:30 AM**

INSTRUCTIONS

1. Answer Question 1 (compulsory) and **any two** questions in Section B.
2. Clearly and cleanly illustrate your answer as appropriate.

SECTION A: COMPULSORY

QUESTION ONE (30 MARKS)

a) Outline the characteristics of plasmids (3 marks)

b) Explain the lysogenic cycle of phage replication (3 marks)

c) outline three practical applications of molecular biology (3 marks)

d) Outline the differences between a DNA and an RNA molecule (3 marks)

e) Explain the functions of neucleoplasm (3 marks)

f) Explain "redundancy" of the genetic code (3 marks)

g) Explain any three types of gel used in electrophoresis (3 marks)

h) Differentiate between Northern and Southern blotting (3 marks)

i) Explain the structural components of a nucleotide (3 marks)

j) Explain the formation of a rDNA molecule (3 marks)

SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)

QUESTION TWO (20 MARKS)

a) Differentiate between transcription and translation (12 marks)

b) Explain how GMOs may be formed (8 marks)

QUESTION THREE (20 MARKS)

Discuss the synthesis of a polynucleotide chain

QUESTION FOUR (20 MARKS)

Discuss a laboratory technique for the separation of macromolecules like DNA, RNA or proteins

QUESTION FIVE (20 MARKS)

a) Illustrate the structure of a named bacteriophage (10 marks)

b) Explain bonding between the complimentary strands of a DNA molecule (10 marks)