MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE IN BIOLOGY

SZL 303: ESSENTIALS OF MOLECULAR BIOLOGY

DATE: 17/4/2019 **TIME: 8.30-10.30 AM**

INSTRUCTIONS

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

SECTION A

QUESTION ONE (30 MARKS)

a) Describe the Okazaki fragment and state its significances (3 marks)

b) Describes the process of ligation and insertion of genes in a plamid (3 marks)

c) Describe briefly the basic structure of mRNA. Use diagram where possible (3 marks)

d) Describe using a simple equation the formation of the aminoacyl-tRNA (3 marks)

e) Describe Watson and Crick Model of DNA (3 marks)

f) Identify the salient features of the polymerisation stage of transcription (3 marks)

g) Describe the Wobbling phenomenon in RNA translations giving a specific example (3 marks)

h) Explain why The genetic codes are degenerate. Briefly discuss (3 marks)

i) Describe the biological significance of the DNA directed RNA synthesis (3 marks)

j) Describe three salient features of a Eucaryotic promoter regions (3 marks)

SECTION B

QUESTION TWO (20 MARKS)

a) Discuss DNA replication (10 marks)

b) Discuss nucleotides in the context of RNA citing examples (10 marks)

QUESTION THREE (20 MARKS)

a) Discuss plasmids and their importance in genetic cloning (10 marks)

b) Design an experiment to explain the phenomenon of semi-conservativeness of DNA replication (10 marks)

QUESTION FOUR (20 MARKS)

Discuss the principles and procedures of any two Nucleic acid based hybridization experiments

QUESTION FIVE (20 MARKS)

a) Describes any animal based biotechnology techniques used to produce transgenic organisms (10 marks)

b) Discuss the post-translation modification of protein as a regulatory mechanism (10 marks)