MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

THIRD YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN BIOLOGY

SZL303 ESSENTIALS OF MOLECULAR BIOLOGY

DATE: 25/7/2019 **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

QUESTION ONE

a) Describe the Okazaki fragment giving its significances (3 marks)

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

c) Briefly describe the basic structure of mRNA. Use diagram where possible (3 marks)

d) Using a simple equation describe the formation of the aminoacyl-Trna (3 marks)

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

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 (3marks)

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

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

j) Briefly discuss three salient features of a Eucaryotic promoter regions (3 Marks)

SECTION B

QUESTION TWO

a) Discuss DNA replication (10 Marks)

b) In the context of RNA discuss the Nucleotides. Use structures where necessary (10 Marks)

QUESTION THREE

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

Discuss the principles and procedures of any two Nucleic acid based hybridization experiments (20 Marks)

QUESTION FIVE

a) Describes the stages involved in the elongation and termination stages of protein translation (10 marks)

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