(*Knowledge for Development*)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS 2020/2021 ACADEMIC YEAR

FOURTH YEAR SECOND SEMESTER MAIN EXAMINATIONS

FOR THE DEGREE OF BACHELOR OF SCIENCE IN BIOLOGY

COURSE CODE: SBL 421

COURSE TITLE: MOLECULAR BIOLOGY

DATE: THURSDAY 14th, October 2021. **TIME:** 2:00 -4:00 p.m.

INSTRUCTIONS TO CANDIDATES

Answer Question one (1) and any other two (2) Questions. Question one is compulsory and carries 30 marks, the other Questions carry 20 marks each.

TIME: 2 Hours

This paper consists of 3 printed pages. Please Turn Over 

KIBU observes ZERO tolerance to examination cheating

QUESTION ONE

a) Using an illustration, describe the morphology of a chromosome. (5 Marks)

b) Describe the term Central Dogma. (4 Marks)

c) State the significance of a DNA in living organisms. (4 Marks)

d) Highlight four enzymes involved in DNA replication. (4 Marks)

e) State four functions of a chromosome. (4 Marks)

f) Describe three effects of gene mutations citing relevant examples. (3 Marks)

g) Classify chromatin found in the DNA protein complex. (4 Marks)

h) State the contributions of Franklin Rosalind in Molecular Biology. (2 Marks)

QUESTION TWO

a) Explain the events that occur during the process of transcription. (10Marks)

b) Using a relevant example, describe the term enzyme repression. (10 Marks)

QUESTION THREE

a) Describe the roles of repressor and operator genes in gene regulation. (8 Marks)

b) Write short notes on the following:-

i. Ribonucleic Acid (6 Marks)

ii. Introns (2 Marks)

iii. Promoter gene (4 Marks)

QUESTION FOUR

a) Describe five types of gene mutations in the DNA of an organism. (10 Marks)

b) Write out the base sequence of mRNA formed from a DNA strand with the following sequence. ATGTTCGAGTACCATGTAAC (2 Marks)

c) Describe four characteristics of the genetic code. (8 Marks)

QUESTION FIVE

a) Describe an experiment which proves that replication is semi-conservative.

(10 Marks)

b) Discuss the structural composition of a DNA molecule. (10 Marks)