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(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS 2020/2021 ACADEMIC YEAR

FOURTH YEAR SECOND SEMESTER SUPPLEMENTARY/SPECIAL EXAMINATIONS

FOR THE DEGREE OF BACHELOR OF SCIENCE IN BIOLOGY

COURSE CODE: SBL 421

COURSE TITLE: MOLECULAR BIOLOGY

DATE: 10TH JANUARY 2022 TIME: 11.00 -1.00 PM

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) Differentiate between constitutive and inducible enzymes. (4 Marks)
- b) Describe the relationship between DNA, mRNA and proteins. (5 Marks)
- c) Define a gene as a:-
- i). A unit of function (2 Marks)
 - ii). A unit of recombination (2 Marks)
- d) Highlight the events that occur during the translation. (4 Marks)
- e) Describe the term a nucleotide. (5 Marks)
- f) Describe the structural composition of an RNA molecule. (4 Marks)
- g) DNA is anti-parallel double helix. Explain the statement. (4 Marks)

QUESTION TWO

- a) State functions of mRNA, tRNA and rRNA. (6 Marks)
- b) Describe two structural changes that occur during chromosomal mutation. (4 Marks)
- c) Describe the dispersive replication. (10 Marks)

QUESTION THREE

- a) Outline the process of transcription in eukaryotes. (10 Marks)
- b) Describe how a cell regulates uptake of lactose. (10 Marks)

QUESTION FOUR

- a) Describe the structure and function of a mitochondria. (10 Marks)
- b) Explain gene control under the following systems :-
- i. Inducible system (5 Marks)
 - ii. Repressible system (5 Marks)

QUESTION FIVE

a) Define the term DNA recombination.

(2 Marks)

b) Explain five mechanisms of DNA repair.

(10 Marks)

c) Discuss four types of chromosomes based on the location of the centromere.

(8 Marks)