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OFFICE OF THE DEPUTY PRINCIPAL
ACADEMICS, STUDENT AFFAIRS AND RESEARCH

UNIVERSITY EXAMINATIONS

2020 /2021 ACADEMIC YEAR

FOURTH YEAR SECOND SEMESTER REGULAR EXAMINATION

FOR THE DEGREE OF BACHELOR OF SCIENCE IN MICROBIOLOGY

COURSE CODE: **MIC 414**

COURSE TITLE: **MOLECULAR GENETICS**

DATE: **12TH JULY, 2021** **TIME:** **08.00AM – 11.00AM**

INSTRUCTIONS TO CANDIDATES

- **SEE INSIDE**

THIS PAPER CONSISTS OF 3 PRINTED PAGES **PLEASE TURN OVER**

REGULAR – MAIN EXAM

MIC 414: MOLECULAR GENETICS

STREAM: BSc Microbiology **DURATION: 3 Hours**

INSTRUCTIONS TO CANDIDATES

i. *Answer **ALL** questions from section A and any **THREE** from section B.*

ii. *Diagrams should be used whenever they serve to illustrate the answer.*

iii. *Do not write on the question paper.*

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SECTION A (24 MARKS)

Question One

a) Describe two factors affecting enzyme activity. (4 Marks)

b) Write short notes on the following:-

i. Transposon (2 Marks)

ii. Activation energy (2 Marks)

iii. Plasmids (2 Marks)

c) Genetic code is degenerate. Explain (2 Marks)

Question Two

a) State two properties of a specialized transducing particle. (2 Marks)

b) Describe the biochemical properties of hydrolases and lyases enzymes. (4 Marks)

c) Explain the process of feedback inhibition of metabolic pathways. (6 Marks)

SECTION B (36 MARKS)

Question Three

a) Give an account of two methods of detection of mutations in microorganisms. (6 Marks)

b) Describe the mechanism of conjugation as a means of gene transfer. (6 Marks)

Question Four

Using Griffith's experiment, account for the principle of transformation. (12 Marks)

Question Five

a) Explain the relationship between gene and protein in molecular biology. (4 Marks)

b) Highlight the events that occur during translation process. (8 Marks)

Question Six

a) Explain the roles of activators, inducers, and repressors in gene regulation. (6 Marks)

b). Describe three mechanisms of catalysis. (4 Marks)

Question Seven

a) Tryptophan is one amino acid that the bacterium *E. coli* can either ingest from the environment or synthesize. Explain how it is regulated within a bacterium cell. (8 Marks)

b) Outline two applications of bacterial gene mapping. (4 Marks)

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