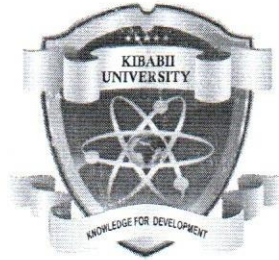


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(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS 2017/2018 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER MAIN EXAMINATIONS

**FOR THE DEGREE OF BACHELOR OF SCIENCE IN BIOLOGY,
BACHELOR OF SCIENCE IN BIORESOURCE MANAGEMENT,
BACHELOR OF EDUCATION SCIENCE AND BACHELOR
AGRICULTURE EDUCATION AND EXTENSION**

COURSE CODE: SBT 223

COURSE TITLE: MICROBIAL GENETICS

DATE: THURSSDAY 2nd August 2018

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 2 printed pages. Please Turn Over



KIBU observes ZERO tolerance to examination cheating

QUESTION ONE

- a) Define the term a gene. (2 Marks)
- b) State four structural differences between DNA and RNA. (4 Marks)
- c) State the function of deoxyribonucleic acid (DNA) molecule. (2 Marks)
- d) State four causes of chromosomal mutation. (4 Marks)
- e) Explain the role of variation in breeding. (2 Marks)
- f) Draw a labelled diagram of a t-RNA (2 Marks)
- g) Write out the base sequence of mRNA formed from a DNA strand with the following sequence. ATGTTTCGAGTACCATGTAACG. (2 Marks)
- h) State two advantages of possessing two sets of chromosomes. (4 Marks)
- i) State two features of a genetic code. (2 Marks)
- j) Differentiate between the following terms:- (2 Marks)
- i. Dominant gene and recessive gene. (2 Marks)
 - ii. Continuous variation and discontinuous variation. (2 Marks)
 - iii. Gene and Alleles. (2 Marks)

QUESTION TWO

- a) Outline five reasons why *Drosophila melanogaster* is a suitable research tool in microbial genetics. (10 Marks)
- b) Define the term transposon. (2 Marks)
- c) Discuss the composition of the Deoxyribonucleic Acid. (8 Marks)

QUESTION THREE

- a) Describe the various DNA repair mechanisms in micro-organisms. (8 Marks)
- b) Describe enzyme induction in gene control citing an example. (8 Marks)
- c) Describe the principle behind blotting as a molecular technique. (4 Marks)

QUESTION FOUR

- a) Describe the stages involved in DNA isolation. (10 Marks)
- b) Using a well labelled diagram, describe the genetic constitution of HIV. (10 Marks)

QUESTION FIVE

- a) Discuss two mechanisms of gene transfer in micro-organisms. (14 Marks)
- b) Describe three applications of genetics in the field of agriculture. (6 Marks)