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(Knowledge for Development)

KIBABII UNIVERSITY
UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR
FIRST YEAR SECOND SEMESTER
MAIN EXAMINATIONS
FOR THE DEGREE OF BACHELOR OF (EDS, BIO, BAB, BBC)

COURSE CODE: SBT 123

COURSE TITLE: GENERAL GENETICS

DATE: Friday 16th July, 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 2 printed pages. Please Turn Over
KIBU observes ZERO tolerance to examination cheating



QUESTION ONE.

- a) Briefly describe the structure of higher eukaryotic genes. (5 Marks)
- b) Describe the basic organisational features of an operon in a prokaryote. (5 Marks)
- c) Explain the genetic code (5 Marks)
- d) With examples distinguish between the purine and pyrimidine bases with respect to structure. (5 Marks)
- e) Differentiate between Paracentric inversion and Pericentric inversion in chromosomal mutation. (5 Marks)
- f) Damage that results in distortion of the DNA helix is often repaired by the *base excision repair pathway* that involves at least five distinctive steps. State the steps of this pathway. (5 Marks)

2. a) What are the karyotypes associated with each of the following syndromes in humans, and what are the primary sexual phenotypes associated with each: (6 Marks)
 - i. Turner syndrome
 - ii. Klinefelter syndrome
 - iii. Trisomy-X
 - b) In a dihybrid cross, a plant with a yellow seed color and round shape was crossed with a plant with a green seed color and a wrinkled seed shape. Determine the genotypes and phenotypes of the progeny using a punnet square (Both white color (W) and the smooth shape (S) are dominant). (10 Marks)
 - c) Use relevant Mendelian laws of inheritance to explain the outcome of the cross in b) above. (4 Marks)
3. Discuss the processes of transcription and translation in protein synthesis in a eukaryotic cell. (20 Marks)
 4. Describe in details the DNA replication. You may accompany your description with diagrams where necessary. (20 Marks)
 5. a) Describe the chromosomal organization in a eukaryotic cell? (10 Marks)
 - b) In tabular form provide the differences between a gene and a Genome. (10 Marks)