

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**FIRST YEAR EXAMINATION FOR THE AWARD OF DEGREE
OF BACHELOR OF SCIENCE**

BOTA 111: GENERAL GENETICS

STREAMS: BSC (AGED) Y1S1 (SB)

TIME: 2 HOURS

DAY/DATE: MONDAY 1/12/2014

2.30 P.M. – 4.30 P.M.

**INSTRUCTIONS: ANSWER ALL QUESTIONS IN SECTION A AND TWO
QUESTIONS IN SECTION B**

SECTION A: SHORT ANSWER QUESTIONS

1. (a) Differentiate between the following terms. [3 marks]
 - (i) Co-dominance and incomplete dominance
 - (ii) Euploidy and polyploidy
 - (iii) Lethal alleles and epistasis
- (b) Explain why haemophilia disease affect more males than females. [2 marks]
2. Suggest five ways in which knowledge of genetics can contribute in improving the quality of human life. [5 marks]
3. (a) Explain Mendel's first law of inheritance [2 marks]
- (b) Predict the probability that selfing an F1 plant from a Mendel's dihybrid cross ($Rr \times Yy$) will produce an off-spring with $rr yy$ genotype. [3 marks]
4. Describe briefly the DNA structure. [5 marks]
5. A black body male fruit fly () is crossed with gray body female. Half of the off-spring are gray bodied and half are black bodied. If the allele for gray body is dominant, what are the genotypes of the parents? Show your working. [5 marks]

6. (a) State the significance of translation. [2 marks]
(b) State three types of RNA and their roles. [8 marks]

SECTION B: ESSAY QUESTIONS (40 MARKS)

7. Write an essay on gene mutations
8. Describe the process of DNA replication
9. (a) The expected proportions of white, brown and pied rabbits in a population are 0.36, 0.48 and 0.6 respectively. In a sample of 400 rabbits there were 140 white, 240 brown and 20 pied. Are the proportions in that sample of rabbits different from what is expected? [12 marks]
- (b) Describe the stages of prophase 1 cell division. [8 marks]
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