

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE AWARD OF DIPLOMA
IN AGRICULTURE AND RURAL DEVELOPMENT

BOTA 0111: GENETICS

STREAMS: DIP (AGRI & RURAL DEVT) Y1S1

TIME: 2 HOURS

DAY/DATE: WEDNESDAY 11/12/2019

11.30 A.M. – 1.30 P.M.

INSTRUCTIONS:

- Answer ALL questions in section A and any TWO in section B
- Do not write anything on the question paper
- Use illustrations where appropriate to enhance your answers

SECTION A (30 MARKS)

1. Define the following terms: [5 marks]
 - (i) Locus
 - (ii) Hybrid
 - (iii) Monoploid
 - (iv) Homozygote
 - (v) Lethal genes
2. (a) A garden pea plant bearing round seeds is crossed with another bearing round seeds.
 - (i) Write the genotypes of these parent plants. [1 mark]
 - (ii) Using a Punnett square, predict the phenotypes of the F₂ generation.

[4 marks]

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3. A researcher mated a creeper cock with a creeper hen. Instead of the expected Medelian phenotypic ratio, she obtained a different ratio;
- (i) In a Punnett square, show the cross the researcher carried out. [2 marks]
 - (ii) Write the phenotypic ratio the researcher obtained. [1 mark]
 - (iii) Explain the reason for that ratio. [2 marks]
4. (a) Name two sex-linked traits occurring in human beings. [2 marks]
- (b) Explain why sex-linked traits are more common in men than in women. [3 marks]
5. With the aid of a well labeled diagram, describe the structure of a chromosome. [5 marks]
6. (a) Give the alleles of the gene controlling coat colour in rabbits. [1 mark]
- (b) A Dorset ram was crossed to a Suffolk ewe and the results (offspring) are shown in the table below. Study and complete the table by showing the genotypes and horn condition of the offspring. [4 marks]

<i>Genotype</i>	<i>Male</i>	<i>Female</i>
h^+h^+	horned	
	horned	hornless
	hornless	

SECTION B (40 MARKS)

- 7. Explain the structure of DNA. [20 marks]
 - 8. Write an essay on sex determination in *Drosophila*. [20 marks]
 - 9. Describe the functioning of the gene that controls the A, B, AB and O blood types in human beings. [20 marks]
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