



MAASAI MARA UNIVERSITY

**REGULAR UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR
SECOND YEAR FIRST SEMESTER**

**SCHOOL OF NATURAL RESOURCE AND
ANIMAL SCIENCES**

**BACHELOR OF SCIENCE IN ANIMAL HEALTH
AND PRODUCTION**

COURSE CODE: AHP 1208-1

COURSE TITLE: PRINCIPLE OF GENETICS

DATE: 7TH APRIL, 2022

TIME: 0830-1030

INSTRUCTIONS TO CANDIDATES

Answer **ALL** questions

Question 1

Briefly discuss Gregor Mendel's laws of principles of inheritance in animal genetics (20 marks).

Question 2

- a) Discuss the difference between genotypes and phenotypes and label the three types of genotypes (10 marks).
- b) Draw a well labelled Punnett square used in animal genetic and breeding, using an example, predict outcomes of a Punnett square (10 marks).

Question 3

- a) Using a well labelled diagram, describe the structure of DNA showing the different parts making the structure (12 marks).
- b) Briefly discuss the following terms "transcription" and "translation" in gene expression process (8 marks).

Question 4

In fruit flies, *Drosophila* spp., the gene for eye colour is carried on the X chromosome. The allele for red eyes is dominant over its recessive allele, white eyes.

- a) If a white-eyed female is mated with a red-eyed male, what will be the appearance of their offspring? (4 marks)
- b) If the daughters from this cross are mated with their father, what types of offspring would be expected and the probability of each? (16 marks)

Question 5

- a) Briefly discuss the concept of population genetics under Hardy-Weinberg Law (5 marks).
- b) If the genotypic frequencies in a population are $MM=0.83$, $MN=0.16$ and $NN=0.01$, what would be the expected mating outcome to occur between MM individuals? Comment on the mating outcome (15 marks).

Question 6

- a) Briefly discuss the two (2) theories of genes cross over during over during cell division process highlighting their significance (10 marks).
- b) Discuss five (5) factors affecting genes cross over during cell division (10 marks).

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