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 2106

COURSE TITLE: ANIMAL GENETICS AND BREEDING

DATE: 1ST APRIL, 2022   TIME: 0830-1030

INSTRUCTIONS TO CANDIDATES

Answer **ALL** questions

Question 1

Briefly discuss in sequential process setting up a breeding program in animal genetics (20 marks)

Question 2

Suppose that in a population of peacocks the phenotypic variance for tail length is 2.5 and the slope of the father – offspring regression for this trait is 0.2. From a long-term captive population, you also have data from a line of completely inbred individuals. In this line the phenotypic variance among individuals is 0.50. Assume that there are no shared environmental effects (Ves) and no epistatic variance (V_I) for this trait. (Given $h_2 = 0.4$) (20 marks)

a) What is the total genetic variance for tail length? (4 marks)

b) What is the additive genetic variance? (4 marks)

c) What is the dominance genetic variance? (4 marks)

d) What is the environmental variance? (4 marks)

e) What is the expected phenotypic covariance among full sibs? (4 marks)

Question 3

Write short notes on mating systems (20 marks).

Question 4

a) Define the term "heterosis" (2 marks)?

b) Using an example, describe how you would estimate average heterosis, where the first generation (F1) is superior to mid parent value (18 marks).

Question 5

Discuss various important reproductive technologies which has led to improved genetic resources (20 marks).

Question 6

a) Describe the importance of relationship in animals breeding (6 marks).

b) Discuss any five (5) methods of reducing inbreeding in a livestock production system (10 marks).

c) Highlight the inbreeding coefficient formula used to calculate inbreeding depression in domestic animals (4 marks).

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