

FEDERAL UNIVERSITY OF TECHNOLOGY, OWERRI  
DEPARTMENT OF ANIMAL SCIENCE AND TECHNOLOGY  
2009/2010 HARMATTAN SEMESTER EXAMINATIONS

AGR 303: AGRICULTURAL GENETICS

TIME ALLOWED: 3HRS

INSTRUCTION: Answer ANY FIVE (5) QUESTIONS (All questions carry equal marks)

1. Garden peas, tall stem (T) is dominant over short stem (t), green pods (G) are dominant over yellow pods (g), and smooth seeds (S) are dominant over wrinkled seeds (s). Suppose a homozygous short, green, wrinkled pea plant is crossed with a homozygous tall, yellow smooth one;

- a) What will be the appearance of the  $F_1$
- b) If the  $F_1$  are interbred, what will be the appearance of the  $F_2$ .
- c) What will be the appearance of the offspring of a cross of the  $F_1$  back to its short, green, wrinkled parent?
- d) What will be the appearance of the offspring of a cross of the  $F_1$  back to its tall, yellow smooth parent?

2. Describe with illustrations 5(five) factors which can cause departures from classical Mendelian inheritance?

3a) Outline the traits in quantitative genetics?

3b) Write briefly on the following;

- i. Natural Selection.
- ii. Artificial Selection.

3c) List the objectives of selection.

4a) Explain briefly, what you understand by Biotechnology?

4b) Describe the contributions of biotechnology in crop and animal breeding?

5a) Describe exhaustively the structure and chemical composition of the genetic material?

5b) Enumerate three each of similarities and differences between DNA and RNA?

6a) What is a triplet Codon?

6b) Define allele frequency?

6c) Given that the frequencies of RR, Rr and rr in a certain population are 0.45, 0.35 and 0.20 respectively. Compute frequencies of R and r.