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

AST 401: ANIMAL BREEDING **TIME ALLOWED: 3HRS**

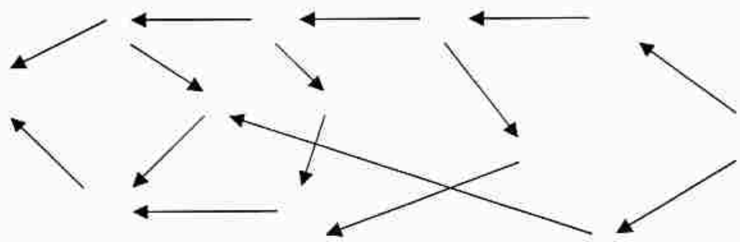
INSTRUCTION: ANSWER ANY FIVE QUESTIONS (ALL QUESTIONS CARRY EQUAL MARKS)

1) In terms of its nature, structure and functions, briefly explain in not more than three pages what you understand the GENE to be.

2) Using descriptive examples in Poultry breeding define and explain the differences between
i) Lethal genes
ii) Detrimental genes.

3) Discuss briefly **any 5 (five) selection methods** of your choice, stating its merits and demerits.

4a) Outline the steps involved in the calculation of inbreeding coefficient and coefficient of relationships.
4b) Using the steps considered above, calculate the inbreeding coefficient of individual X in the arrow diagram given below;



5a) Explain the tem "Phenotypic expression of genes" using illustrations where necessary.
5b) Given a mating between a homozygous black polled bull and a homozygous red horned cow, where polledness (P) is dominant to horns (p) and black (B) is dominant to red (b). What ratio of genotype and phenotype is expected in the first filial generation (F_1) offsprings.
5c) Assuming a mating of the F_1 offspring in b) above, what ratio of genotype and phenotype is expected in the F2. Show all illustrations.

6a) What are the causes of phenotypic variation in farm animals. Explain each.
6b) Define these terms.
i. Quantitative traits.
ii. Epistasis.
iii. Sex influenced inheritance.
iv. Variations in phenotypic ratios.
v. Sex limited inheritance.

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INSTRUCTION: ANSWER 5 QUESTIONS IN ALL (ALL QUESTIONS CARRY EQUAL MARKS

TIME ALLOWED: 3HRS

1. In terms of its **nature**, **structure** and **functions**, attempt a clear explanation of what you understand the GENE to be.

2a. Using illustrative examples in animal breeding, explain what you understand by

i. Additive gene action

ii. Non additive gene action.

2b. With reference to parental genotype, supply the information on the breeding results for crosses in the genotype of parents below:

Genotype of parent	Genotypic Ratio of offspring	Breeding ability of offspring
RR x Rr	1RR	-
	1Rr	-
RR x RR	-	-
RR x rr	-	-
Rr x Rr	-	-
	-	-
	1rr	Breeds true
Rr x rr	-	-
	-	-
rr x rr	All rr	All breeds true

3a. Explain these terms

i. Repeatability

ii. Heritability

iii. Most Probable Producing Ability

3b. Below is the record of fleece weight from three shearing from seven sheep. Calculate the repeatability estimate of fleece weight in that flock.

	Animals						
Shearing	1	2	3	4	5	6	7
1	41.8	33.0	38.5	43.7	34.2	32.6	36.2
2	38.9	37.5	35.9	38.9	38.6	38.4	33.4
3	36.1	33.1	33.9	36.3	40.2	34.8	37.9

4a. Use one example each to explain what you understand by each of the following terms

i. Sex linked

ii. Sex influenced

iii. Sex limited inheritance

4b. What do you understand by the term heredity and environment interaction?

5a. Describe the situation in which the following selection methods are most useful

i. Combination selection

ii. Family selection

iii. Indirect selection

iv. Progeny testing

5b. Mention the problems (if any) associated with the methods of selection in question?

6. From the arrow diagram given below, determine the inbreeding coefficient of individuals X and the coefficient of relationship of individual S and D.

7a. Give a detailed account of the following:

i. Physiological basis of inbreeding

ii. Physiological basis of crossbreeding.

7b. Compare and contrast the consequences of homozygosity and heterozygosity in a population.