FEDERAL UNIVERSITY OF TECHNOLOGY, OWERRI.

SCHOOL OF AGRICULTURE & AGRICULTURAL TECHNOLOGY,

DEPARTMENT OF ANIMAL SCIENCE & TECHNOLOGY

2008/2009 RAIN SEMESTER EXAMINATION

AST 510: APPLIED ANIMAL BREEDING

Time Allowed: 3 hours.

INSTRUCTION: Answer any five (5) questions. Each question carries equal marks.

SECTION A

1. Explain vividly using illustrative examples the under listed headings:

a. Sex determination.

b. Gene mutation/Lethal gene.

c. Random Sample Test.

d. Performance Test.

(2a) What is gene mutation?
(b) How may new mutations affect a biochemical reaction in Animals.
(c) What is the practical importance of mutations in Farm Animals
(d) Distinguish between lethal and sub-lethal gene.

(3) List five (5) important economic traits in poultry and indicate how to measure them as accurately as possible?

(4) Outline in detail the procedure you would recommend for the improvement of any trait of your choice in dairy cattle?

SECTION B

(5) Suppose each of 3 sires was mated to 5 females and each mating produced 3 offspring.

i) Give a skeletal analysis of variance table, consisting of sources of variation, d.f. and expression for Expected Mean Square (EMS).
ii) Suppose the following mean squares were obtained in the ANOVA table in question 5i above: $MS_{sire} = 55$, $MS_{dam} = 25$ and $MS_{error} = 12$. Obtain estimates of δ^2_s, δ^2_d and δ^2_e.
iii) Estimate heritability due to sire.

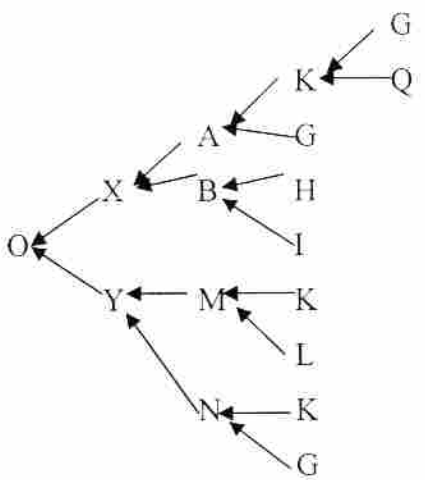
(6a) Given that five sires were each mated to eight dams but not all dams produced a progeny as shown below;

Sire	Number of Progeny
A	8
B	4
C	5
D	6
E	8

Estimate the coefficient K1 (number of progeny from the ith sire) in the expected MS.

b. Write and explain the Statistical Model for a one-way ANOVA for Sire effect in a breeding experiment.

(7a). Given the Pedigree Tree below



Compute the Inbreeding Coefficient of the individual O. Assume $F_K=¼$ and $F_G=0$.

(b). Write short notes with illustrations on these terms;

i. Backcrossing.
ii. Grading up.
iii. Inbreeding Coefficient
iv. Crisscrossing
v. Random mating.