



KISII UNIVERSITY

UNIVERSITY EXAMINATIONS

**THIRD YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF
SCIENCE IN ANIMAL SCIENCE
SECOND SEMESTER 2024/2025
[JANUARY – APRIL, 2025]**

ANSC 372: DESIGN AND ANALYSIS OF ANIMAL EXPERIMENTS

STREAM: Y3 S2

TIME: 2 HOURS

DAY: THURSDAY, 3:00 - 5:00 P.M.

DATE: 10/04/2025

INSTRUCTIONS:

- 1. Do not write anything on this question paper.**
- 2. Answer ALL questions in section A and any other TWO in section B.**

SECTION A: (40 MARKS)

QUESTION ONE

- i. Explain the following
 - a. Hypothesis (3 marks)
 - b. Type II error (3 marks)
 - c. Experimental unit (2 marks)
 - d. Treatment (2 marks)
- ii. Briefly discuss three principles of experimentation (6 marks)
- iii. When do you use the following in an agricultural experimentation (4 marks)
 - i. Latin square design
 - ii. Completely Randomized design
- iv. Elaborate correlation and regression analysis (4 marks)

QUESTION TWO

In an experiment to compare the of four diets on weight gain in piglets. The nutritionist decided to set up the experiment in a Randomized Complete Block design. The incomplete ANOVA table is presented below

Source of variation	DF	Sum of Squares (SS)	Mean sum of squares (MSE)	F

Replications	3	26.36	-	-
Treatments(Diets)	3	216.23	-	-
Error	-	57.95	-	
Total	15	300.54		

$F_{3,12}(\alpha=0.05) = 3.49$

- i. Give the linear model for the design and explain all the terms used (5 marks)
- ii. Complete the sample ANOVA table above; (6 marks)
- iii. Do you reject or fail to reject the null hypothesis? Explain. (5 Marks)

SECTION B: (30 MARKS)

QUESTION THREE

- a) Where is the Randomized complete design used mostly [2 marks]
- b) What are the sources of variation of this design [2 marks]
- c) A set of data involving four tropical feeds A, B C and D tried on chicks is given below. All the 20 chicks are treated a like in all respects, except the feeding treatment and each feeding treatment is given to 5 chicks. Weight of chicks on different feeding materials of the feeds is tabled

Feed					Totals
A	55	42	21	52	219
B	61	30	89	63	355
C	42	81	95	92	407
D	169	169	85	154	714
Totals					1695

- d) State the hypothesis for this experiment [2 marks]
- e) Is there any significant differences between the four feeds (use $F_{3,12}=3.49$ [9 marks]

QUESTION FOUR

Given the following data below obtained for two pairs of variables X_1 and X_2

X_1	4	4	5	5	4	6	5
(X_2)	2	3	3	4	4	4	4

- i. Define Correlation coefficient (r^2) and coefficient of determination (R^2) (5 marks)
- ii. Find the coefficient of linear correlation between variables X_1 and X_2 (8 marks)
- iii. Make a comment on the results obtained in (ii) above (2 marks)

QUESTION FIVE

- i. Define an experimental design [marks]

- ii. Name three assumptions underlying the Analysis of variance (ANOVA)
[3 marks]
- iii. The following designs could be used while carrying out an agricultural experiment
 - a. Completely randomized design
 - b. Completely randomized block design
 - c. Latin square design
- iv. Give any two advantages and one disadvantage of using each of the above designs
[9 marks]