



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND
TECHNOLOGY**

SCHOOL OF AGRICULTURAL AND FOOD SCIENCES

**THIRD YEAR FIRST SEMESTER UNIVERSITY EXAMINATION
FOR THE DEGREE OF BACHELOR OF SCIENCE IN ANIMAL
SCIENCE**

2022/2023 ACADEMIC YEAR

REGULAR

COURSE CODE: AAB 1305

COURSE TITLE: DESIGN AND ANALYSIS OF ANIMAL EXPERIMENTS

EXAM VENUE:

STREAM: BSc. Animal Science

DATE:

EXAM SESSION:

TIME: 2 HOURS

Instructions:

- 1. Answer ALL questions in section A and ANY other 2 Questions in section B.**
- 2. Candidates are advised not to write on question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

SECTION A (30 MARKS)

ANSWER ALL QUESTIONS IN SECTION

1. Distinguish between the following terms **(10 marks)**
Treatment
Experimental Unit
Experimental error
Control
Measurement Unit
2. Explain how replication and randomization can be used to achieve an estimation of the error in the design of experiments **(4 marks)**
3. Using diagrams, explain the term blocking as used in experimental designs highlighting its main advantages **(4 marks)**
4. Experiments are important and highly relevant to any animal scientist involved in research. Explain any three advantages of experiments **(4 marks)**
5. Differentiate between the Least Significant Difference and Coefficient of Variability stating the function of each **(4 marks)**
6. Explain the main functions of 'R' and R² values in correlation analyses. **(4 marks)**

SECTION B [40 MARKS]

ANSWER ANY TWO QUESTIONS IN THIS SECTION

Q1.

The following data were recorded in a field experiment by Animal Science students

	Replicates			
Treatment	1	2	3	4
1	56	49	65	60
2	84	78	94	93
3	80	72	83	85

Compute the;

- (i) Analysis of variance **(10marks)**
- (ii) Coefficient of variation (CV) **(5marks)**
- (iii) Least significant difference (LSD) at 5% level of significance **(5 marks)**

Q2

(a) Third year Animal Science students at JOOUST determined the effect of washing and removing excess moisture by wiping or by air current on the ascorbic acid content of fodder M. The data was analyzed using JMP-STAT statistical package and treatment means determined as T1; 5.1, T2; 4.3, T3; 4, T4; 6.7, T5; 6.1 and T6; 7.1. The following is the incomplete computer output of ANOVA.

Source of variation	d.f	ss
Blocks	3	3.14
Treatments	-	31.65
Error	-	19.72
Total	23	54.51

- (i) Complete the ANOVA table above **(5 marks)**
- (ii) Explain usefulness of Fischer value **(2 marks)**
- (iii) Discuss these results and make recommendations **(3 marks)**

(b) Discuss Randomized Complete Block Design under the following subheadings **(10 marks)**

- (i) Advantages and disadvantages
- (ii) Appropriate conditions for its application

Q3

- (a) With elaborate illustrations, discuss the assumptions underlying the analysis of variance. **(10marks)**
- (b) Discuss the type I and type II error **(10marks)**