

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATIONS
RESIT/SPECIAL EXAMINATION**

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN
HORTICULTURE**

HORT 371: AGRICULTURE EXPERIMENTATION

STREAMS: BSC HORT

TIME: 2 HOURS

**DAY/DATE: THURSDAY 12/08/2021
P.M.**

11.30 A.M – 1.30

INSTRUCTIONS:

- The paper contains section A and B
- Answer all questions in section A and any two from section B
- Marks for each question are indicated in parenthesis ()
- Total marks = 70

SECTION A: TOTAL MARKS 30

QUESTION ONE

Differentiate the following statistical terms;

- a) Type I and Type II error (5 Marks)
- b) Confidence interval and confidence level (5 Marks)

QUESTION TWO

- a) Explain the process involved in hypothesis testing (7 Marks)
- b) What factors affect the power of a hypothesis test? (3 Marks)

QUESTION THREE

An experiment was conducted using a Randomized Complete Block Design (RCBD) with four (4) replications, six (6) treatments and three (3) samples from each experimental unit. On the basis of the foregoing information

- a) Provide a linear model for the experiment and define the terms (2 Marks)
- b) Construct analysis of variance (ANOVA) table showing the sources of variation and respective degrees of freedom. (8 Marks)

SECTION B: TOTAL MARKS 40

QUESTION FOUR

- a) Why do we use regression in experimental data analysis? (10 Marks)
- b) An experiment was conducted to determine the association between 30 minutes of mixing sweet potato flour and the index of textural quality of dough for making sweet potato pie. The analysis of variance (ANOVA) of the data is shown in Table 2.

Table 1: ANOVA table for regression analysis

Sources of variation	Degrees of freedom	Sum of Squares	Mean Squares	F Calculated
Treatment	1	1205.5462		
Error	28	160.4233		
Total	29	1365.9695		

On the basis of the data in Table 2;

- i) Determine the mean of squares and F Calculated (5 Marks)
- ii) Test the hypotheses given the F tab to be 205.3 and at 5% significant level and explain

(5 Marks)

QUESTION FIVE

A random sample of 10 coffee farmers from Tharaka Nithi County were surveyed to know the yields they achieve during the short rains and long rains respectively. The results were given in tons as shown in the table below. The county government developed a regression equation which they will use to predict long rains from the short rain yields for the next long rains

Farmer	Short rain yield (tons) (X)	Long rain yield (tons) (Y)
1	98	90
2	66	74
3	100	98
4	96	88
5	88	80
6	45	62
7	76	78
8	60	74

9	74	86
10	82	80

- a) Develop the regression equation the county government used for predicting the next long rain yields for coffee
(10 Marks)
- b) If the short rain yields were 60 and 80 respectively. What are the projected long rain yields for
- I. 50 Tons (5 Marks)
 - II. 70 Tons (5 Marks)

QUESTION SIX

- a) What are the characteristics of a good data table (10 Marks)
- b) Enumerate the characteristics of good hypothesis (10 Marks)
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