

HORT 371



UNIVERSITY EXAMINATIONS

RESIT/SUPPLEMENTARY EXAMINATION

EXAMINATION FOR THE AWARD OF DEGREE OF BACHALOR OF SCIENCE IN
HORTICULTURE

HORT 371-AGRICULTURAL EXPERIMENTATION

STREAMS: BSC. HORTICULTURE

TIME: 2 HOURS

DAY/DATE: TUESDAY 04/05/2021

8.30A.M – 10.30

A.M

INSTRUCTIONS

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

SECTION A: TOTAL MARKS 30

QUESTION ONE

You are involved in an experiment to test three types of nitrogen fertilizer on the growth of maize plants in a ward in Tharaka Nithi County. Describe how the following principles would be applied in the experimental plots and the importance of each.

- | | |
|-------------------|-----------|
| i) Randomization | (4 marks) |
| ii) Local control | (3 marks) |
| iii) Replication | (3 marks) |

QUESTION TWO

Using your own set of data from samples obtained from an agricultural experiment demonstrate determination of the following

- i) The mean (3 marks)
- ii) The variance (4 marks)
- iii) Standard deviation (3 marks)

QUESTION THREE

- a) State the characteristics of a good data table (5 Marks)
- b) Enumerate the characteristics of good hypothesis (5 Marks)

SECTION B: TOTAL MARKS 40

QUESTION FOUR

An experiment was conducted to determine the effect of three (3) methods of soil preparation on the first year of growth of avocado seedlings. Four locations were selected and each location was divided into Three (3) plots. A RCBD was employed using locations as blocks. The method of soil preparation was: A (No fertilizer), B (light fertilization), C (burning). The observations recorded were the average first year growth of seedlings on each plot. The analysis of variance (ANOVA) for the data was as follows

Sources of variation	Degrees of freedom	Sum of Squares	Mean Squares	F Cal
Treatment (Soil Preparation)	2	38.0		
Blocks (locations)	3	61.6667		
Error	6	11.333		
Total	11	111.0		

On the basis of the data in the table above,

- a) Determine the mean of squares and F Calculated (10 Marks)
- bi) Do the data provide sufficient evidence to indicate a difference in the mean growth for the 3 soil preparations? (use $F_{2,6}, \alpha=0.05=5.14$) (5 Marks)
- ii) Is there evidence to indicate a difference in the mean rates of growth for the 4 locations? (use $F_{3,6}, \alpha=0.05=4.76$) (5 Marks)

QUESTION FIVE

Research in agriculture is an important tool that can be used to solve food production problems in Kenya

i) Describe at least four current problems that hinder food production in Kenya. (8Marks)

ii) Explain how research can be applied to help find solutions to these challenges. (8Marks)

iii) In your opinion what two major hindrances limit agricultural research in in Kenya and how can they be solved? (4 marks)

QUESTION SIX

An experiment consisted of eight (8) treatments in three (3) replications in a completely randomizes design. There four (4) samples per experimental plot. Using this information

a) Provide a linear model for this experiment and define terms (2 Marks)

b) Show the analysis of variance (ANOVA) with sources of variation and degrees of freedom

(8 Marks)

c) Describe at least five data collection methods you can use a researcher (10 Marks)
