

CHUKA



UNIVERSITY

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RESIT/SUPPLEMENTARY EXAM

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

HORT 371: AGRICULTURAL EXPERIMENTATION

STREAMS: BSC. HORTICULTURE

TIME: 2 HOURS

DAY/DATE: MONDAY 16/11/2020

11.30 A.M. – 1.30 P.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

- a) What is
- i) A single factor experiment (5 Marks)
 - ii) Type II error in experimentation (5 Marks)

QUESTION TWO

- a) What is the importance of measures of central tendency and measures of dispersion (5 Marks)
- b) What is replication and its purpose (5 Marks)

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QUESTION THREE

The weight of nine randomly selected orange fruits were shown in the Table below in grams.

SN	WEIGHTS
1	6
2	7
3	10
4	11
5	11
6	13
7	16
8	18
9	25

Find:

- i) Sample mean (2 Marks)
- ii) Sample variance (2 Marks)
- iii) Sample Median (2 Marks)
- iv) Sample range (2 Marks)
- v) Standard Deviation (2 Marks)

SECTION B: [TOTAL MARKS 40]

QUESTION FOUR

- a) Statisticians follow a formal process to determine whether to reject a null hypothesis based on sample data. Explain the process involved in hypothesis testing (14Marks)
- b) What factors affect the power of hypothesis test (6 Marks)

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QUESTION FIVE

An experiment consisted of five (5) treatments in three (3) replications in a completely randomized design. There were three (3) samples per experimental plot. Using this information

- a) Provide a linear model for this experiment and define terms (4 Marks)
- b) Show the analysis of variance (ANOVA) with sources of variation and degrees of freedom (16 Marks)

QUESTION SIX

An experiment was conducted to determine the effect of three (3) methods of soil preparation on the first year of growth of Mango seedlings. Four locations (Farm land) 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)
- b)
 - i) 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)