

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

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

HORT 371: AGRICULTURE EXPERIMENTATION

STREAMS: BSC HORTICULTURE

TIME: 2 HOURS

DAY/DATE: FRIDAY 12/4/2024

8.30 A.M. – 10.30 A.M.

INSTRUCTIONS:

- 1. The paper contains sections 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

Explain the following terms

- Blinding effect (3 marks)
- Confounding effect (4 marks)

QUESTION TWO

During agricultural research, variability both in laboratory and field research is a common occurrence. Explain sources of variability and how they can be managed to reduce their impacts on results. (9 marks)

QUESTION THREE

- Choosing a research topic is the first step in the process of carrying out research. Come up with two research topics you consider important for your home ward and develop objectives for each of the topics. (6 marks)
- What factors would you consider to prioritize the topic to carry out research first? (2 marks)

QUESTION FOUR

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

- i) Describe at least two current problems that hinder food production in Kenya.(2 marks)
- ii) Explain how research can be applied to help find solutions to these challenges.(2 marks)
- iii) In your opinion what two major hindrances limit agricultural research in Kenya and how they can be solved? (2 marks)

SECTION B: TOTAL MARKS 40

QUESTION FIVE

- a) Describe four types of questionnaires used in data collection and explain the characteristics of a good questionnaire. (10 marks)
- b) Data analysis is an important component of agricultural research but choice of proper statistical tool is key. Explain the importance of using proper statistical tool in analyzing data. (10 marks)

QUESTION SIX

- a) Explain at least five possible reasons why it is important for an agricultural researcher to publish experimental research findings. (10 marks)
- b) Explain possible factors that can hinder publishing of research data and how they can be minimized. (5 marks)
- c) Describe practical uses of published agricultural related data in your county. (5 marks)

QUESTION SEVEN

- a) Sampling is an important aspect in agricultural research. Explain the significance of sampling while undertaking agricultural research. (6 marks)
- b) 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 (Farmland) 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

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first year growth of seedlings on each plot. The analysis of variance (ANOVA) for the data was as follows:

Source of variation	Degrees of freedom	Sum of Squares	Mean Squares	F Cal
Treatment (soil preparation)	2	38.0		
Block (locations)	3	61.6667		
Error	6	11.3333		
Total	11	111.0		

On the basis of the given information and data in the table above

- i) Do the data provide sufficient evidence to indicate a difference in the mean growth for the 3 soil preparations? (use $F_{2,6}$, $\alpha=0.05=5.14$) (4 marks)
 - ii) Is there evidence to indicate a difference in the mean rates of growth for the 4 locations? (Use $F_{3,6}$, $\alpha=0.05=4.76$) (4 marks)
 - c) Describe at least five agricultural related problems in your county which could be solved through research. (6 marks)
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