

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATIONS**

**EXAMINATION FOR THE AWARD OF BACHELOR OF SCIENCE IN  
AGRICULTURE AND FOOD SCIENCE TECHNOLOGY**

**AGRI 392/391: AGRICULTURE EXPERIMENTATION**

**STREAMS: BSC AGRICULTURE & FOOD TECHNOLOGY**

**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

- i) The characteristics of a good research. (4 marks)
- ii) Importance of research in Agriculture. (3 marks)

**QUESTION TWO**

You are involved in an experiment to test the most suitable bean variety among three varieties B1, B2 and B3 in your home Ward.

- i) Describe at least three ways in which a farmer participatory approach can be applied in this experiment. (4 marks)
- ii) Explain how you would ensure blinding in data collection assistants. (2 marks)
- iii) Describe two possible mistakes that could occur during the data collection and how you would minimize them. (4 marks)

**QUESTION THREE**

In formulating a good hypothesis, as a researcher you should generate as many ideas as possible and then examine each statement critically before stating your hypothesis. In view of the aforementioned enumerate the characteristics of good hypothesis. (7 marks)

**QUESTION FOUR**

Agricultural researchers undertake experiments and research for different reasons. With examples, explain reasons for carrying out Agricultural research in Kenya. (6 marks)

**SECTION B: TOTAL MARKS 40**

**QUESTION FIVE**

(a) Agricultural experiments require several techniques to be successful. However, when conducting research some mistakes may be committed by the researchers. Differentiate the different types of mistakes that can occur while conducting a field agricultural experiment. (20 marks)

**QUESTION SIX**

(a) Publication of agricultural research findings in developing countries like Kenya is not likely to be below that in developed countries despite the presence of many Universities offering courses in agriculture in the developing countries.

- i) Explain at least four major possible causes of the low levels of publications and how it can be improved. (4 marks)
- ii) Describe three ways in which you can use published data if it is available to improve food production in your country. (4 marks)

(b) The outcome of agricultural research depends on the experimental design among other factors. Explain what factors to consider when choosing an experimental design. (10 marks)

**QUESTION SEVEN**

- (a) Explain at least five factors that could hinder agricultural research in Kenya and suggest possible solutions. (5 marks)
- (b) Describe at least five agricultural related problems in your county which could be solved through research. (5 marks)

(c) Four chemical plants (A,B,C,D) producing the same products and owned by the same company discharge effluents into the streams in the vicinity of their locations. To check on the extent of the pollution created by the effluent and to determine if this varies from plant to plant the company collected a random sample of liquid waste, five specimens for each of the four plants and analyzed the specimen in a government laboratory. The analysis of variance (ANOVA) of the data was as follows;

Source of variation	Degree of freedom	Sum of squares	Mean squares	F calculated
Plant (treatment)	3	0.4649		
Error	16	0.4768		
Total	19	0.9417		

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

- a. Identify the experimental design applied in this experiment. (1 marks)
- b. Do the data provide sufficient evidence to indicate a difference in the mean amount of effluent discharge by the four plants (use  $F_{3,16}$ ,  $\alpha = 0.05 = 3.24$ )? (4 marks)

.....