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2nd SEMESTER 2016/2017



UNIVERSITY OF SWAZILAND

MAIN EXAMINATION PAPER

PROGRAMME: BACHELOR OF SCIENCE IN AGRONOMY YEAR 3

COURSE CODE: CP 307

TITLE OF PAPER: FIELD EXPERIMENTATION

TIME ALLOWED: TWO (2) HOURS

INSTRUCTION: ANSWER QUESTIONS 1 AND 2, WHICH ARE COMPULSORY AND ANY OTHER TWO QUESTIONS OF YOUR CHOICE

NOTE: STUDENTS SHOULD BE PROVIDED WITH GRAPH PAPER

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## QUESTION 1
## (THIS IS A COMPULSORY QUESTION)

Write on the following (a to g). Each answer carries four marks)
(a). Types of experiments.
(b). Methods of randomizing treatments in an experiment.
(c). Split-plot design.
(d). Border effects in field experimentation.
(e). Least significant difference.
(f). Correlation.
(g). Concept note

(28 Marks)

## QUESTION 2

(THIS IS A COMPULSORY QUESTION)

Below are maize yields from a two-factor experiment on the effects of four types of manure and three rates of each from research at Luyengo Crop Production Farm. The net plot was one maize row, 5 m long. Compute the seed yield (kg/ha) from the data for the two main effects, draw graph for each main effect as well as the interactions and interpret your results.

| Types of manure | Rates of manure (tonnes/ha) | Seed yield (g/net plot) |
|---|---|---|
| Goat | 0 | 762 |
| Goat | 30 | 2049 |
| Goat | 60 | 3412 |
| Cattle | 0 | 612 |
| Cattle | 30 | 2123 |
| Cattle | 60 | 3870 |
| Poultry | 0 | 784 |
| Poultry | 30 | 2985 |
| Poultry | 60 | 3187 |
| Sheep | 0 | 865 |
| Sheep | 30 | 2689 |
| Sheep | 60 | 3541 |

(28 Marks)

(10

## QUESTION 3

From the information below, complete the ANOVA table.
(a) Title: Effects of five bean varieties at four planting densities on seed yield at Crop Production Department, Luyengo campus.
(b) The researcher has no prior knowledge on the performance of the varieties nor of their response to planting population.
(c) Number of replicates: 4
(d) Plot size: Five rows each 6 m long
(e) Inter- and intra-row spacing: As recommended for Luyengo community.

(a) Complete the table below from information above (Reproduce this table in your answer script)

| Source of variation | Degrees of freedom |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |

(11 Marks)

(b) If the researcher wishes to apply 300 kg/ha of a compound fertiliser (2-3-2 (38) as basal fertilizer and 25 kg/ha of nitrogen as side dressing. How many grams of the compound fertiliser should he apply per row? If the source of nitrogen is urea, how many grams of urea should the researcher apply per row

(11 Marks)

**(22 Marks)**

## QUESTION 4

Distinguish between the following:

(a) Main objectives and specific objectives in field experimentation

( 5 Marks)

(b) Gross and net plots

( 5 Marks)

( c) Guard rows and end row in field experimentation.

( 4 Marks)

(d) Completely randomized design and randomized complete block design.

( 4 Marks)

(e) SED and SE.

( 4 Marks)

**(22 Marks)**

## QUESTION 5

(a) What is the difference between on-station research and on-farm research?.

(6 Marks)

(b) Write on the advantages and disadvantages of on-station research.

(8 Marks)

(c ) Write on the advantages and the disadvantages of on-farm research.

(8 Marks)

**(22 Marks)**