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2nd SEMESTER 2017/2018

UNIVERSITY OF SWAZILAND

SUPPLEMENTARY 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 ALL QUESTIONS

NOTE: STUDENTS SHOULD BE PROVIDED WITH RANDOM NUMBER TABLE OF 10

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QUESTION 1

Write on the following terms/phrases **[a-e]**. Each answer carries five marks.

(a). Neighbour effects in field experimentation.
(b). Gross plots and net plots.
(c). Types of research.
(d). List 8 components of a research proposal.
(e). Choice of experimental sites.

[25 marks]

QUESTION 2

A maize research experiment at Crop Production Department Farm at Luyengo, has three rates of nitrogen in a randomized block design. Each question carries five marks.

(a). What is the minimum number of replicates needed for the experiment?

(b). Write a skeletal ANOVA Table for source of variation and degrees of freedom for the experiment.

(c) If each gross plot is 5 rows and 6 m long, with no space between plots and 1 m between replicates, how much land will you need for the experiment?

(d). Draw a field plan for the experiment and indicate the position of plot labels in each plot.

(e)List four materials that you can use for plot labelling

[25 Marks]

QUESTION 3

(a) A trial has eight treatments replicated four times in a randomised block design. The site is sloppy from west to east. Draw a field plan for the experiment demonstrating how you would minimise the effects of the slope with respect to soil fertility and moisture content.

(10 Marks)

WEST  EAST

(b)A researcher has a trial with eight treatments replicated three times, He has a choice of [i] first planting all the eight treatments in replicate I before going to plant replicates II, III and IV or a choice of [ii] planting one treatment at a time in all the replicates before going to plant treatments 2, 3, 4, 5, 6, 7, and 8. Which method of planting would you recommend and why?

(15 Marks)
[25 Marks]

QUESTION 4

A researcher plans to find the effects of nitrogen fertiliser on maize growth, development and yield. The treatments are four nitrogen levels: 0, 30, 60 and 120 kg/ha]. The design of the experiment is randomized block design. Each treatment is replicated five times.

(a). If the researcher plans to sacrifice five plants for growth analysis and plans a total of five such sequential sacrificial harvests, indicate the row for sequential growth analysis for the five times and also indicate and calculate the area for the net plot.

(10 Marks)

(b). If the source of nitrogen is urea, how many grams of urea will the researcher need per plant at the rate of nitrogen of 120 kg/ha?

(10 Marks)

(c) . What other nutrients should the researcher apply to the plots that receive nitrogen?

(3 Marks)

(d). Should the control plot [no nitrogen applied] also receive the other nutrients? If yes, why?, If not yes, Why not?

(2 Marks)
[25 marks]