



**2nd SEMESTER 2013/2014**

**PAGE 1 OF 3**

**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 AND  
RANDOM NUMBER TABLE OF 10**

**DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED  
BY THE CHIEF INVIGILATOR**

## QUESTION 1

## QUESTION 1

(THIS IS A COMPULSORY QUESTION)

Write on the following terms. Each answer carries four marks.

- [a]. Experimental designs.
- [b]. Randomisation.
- [c] The nature of agricultural research.
- [d]. Use of counter [coin] method as a tool for the elicitation of preferences.
- [e] Draw a plot layout of a randomised block design experiment with four treatments and five replicates and indicate the position of plot labels on the layout.
- [f] List four reasons for involving farmers in on-farm research
- [g] List 8 components of a research proposal

[28 marks]

## QUESTION 2

(THIS IS ALSO A COMPULSORY QUESTION)

Below are maize yields from an experiment at Luyengo Campus for a two-factor experiment on the effects of three sources of poultry manure and three rates of each. Plot size was one row 5 m long. Calculate the yield [kg/ha] for the two main effects and their interactions. Draw graphs for the main effects and the interactions and comment on your results.

Sources of kraal manure	Rates of poultry manure [tonnes/ha]	Seed yield [g/plot]
Eagle's Nest	0	890
Eagle's Nest	30	2526
Eagle's Nest	60	3453
Manzini Poultry Farm	0	624
Manzini Poultry Farm	30	2543
Manzini Poultry Farm	60	3678
Mafutseni Livestock Farm	0	934
Mafutseni Livestock Farm	30	2816
Mafutseni Lvestock Farm	60	4512

[28 Marks]

**QUESTION 3**

List the national experimental stations in Swaziland. Indicate the main research focus for each station and explain why there are so many research stations in Swaziland, given the size of the country. Show on a large map of Swaziland, the agro-ecological zone where the experimental stations are located.

[22 Marks]

**QUESTION 4**

Write on the following terms.

[a]. Correlation [4]

[b]. LSD [3]

[c]. S.E  $\pm$  [4]

[d]. Replication [3]

[e]. Venn diagram [3]

[f]. On-farm research [5]

[22 Marks]

**QUESTION 5**

An experiment was conducted on the response of two maize varieties [factor A] to three plant densities [factor B]. The experimental design was a randomised complete block and treatments were replicated four times. Complete the table below

Source of variation	Degrees of freedom	Sum of squares	Mean square	F value
Replication		365428.0		
		397979.5		
Factor B		128553.5		
Interaction		71995.0		
Error		2223703.0		Not applicable
		Not applicable	Not applicable	Not applicable

[22 Marks]

Table of random numbers up top 10

Replicates									
I	II	III	IV	V	VI	VII	VIII	IX	X
8	2	1	1	6	2	9	8	4	10
5	8	5	3	1	5	2	2	9	5
7	7	10	5	2	1	3	6	1	2
6	3	6	4	9	6	5	7	2	4
2	1	9	8	8	8	4	10	3	8
4	5	7	7	3	10	7	9	10	9
10	10	4	9	10	9	8	1	5	3
9	6	3	6	5	7	10	5	7	1
3	4	8	10	7	3	6	4	8	6
1	9	2	2	4	4	1	3	6	7