



# MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

P.O. Box 972-60200 – Meru-Kenya.

Tel: 020-2069349, 061-2309217. 064-30320 Cell phone: +254 712524293, +254 789151411

Fax: 064-30321

Website: [www.must.ac.ke](http://www.must.ac.ke) Email: [info@must.ac.ke](mailto:info@must.ac.ke)

---

## University Examinations 2015/2016

THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF  
BACHELOR OF SCIENCE IN HORTICULTURE

**AHS 2307: RESEARCH EXPERIMENTAL DESIGN AND ANALYSIS**

**DATE: NOVEMBER 2015**

**TIME: 2 HOURS**

---

**INSTRUCTIONS:** Answer question *one* and any other *two* questions

---

### QUESTION ONE (30 MARKS)

- a) Define the following terms
- i) Research (2 Marks)
  - ii) Treatment (2 Marks)
  - iii) Factor (2 Marks)
- b) State and give brief explanations of any three important variables an agricultural research is to put into consideration (6Marks)
- c) Explain the three factors which need to be considered when choosing a good experimental design (6Marks)
- d) Differentiate Complete Randomised Block Design (CRBD) from Randomised complete Block Design(RCBD) using diagrams (4 Marks)
- e) A researcher conducted an experiment where he planted potato tubers varieties in four plots. However some plots with variety A and variety C failed to grow and thus he failed to harvest the tubers. Below is a table to show the number of bags harvested per plot.

BLOCK	I	II	III	IV
Variety A	40	45	42	
Variety B	41	43	46	45
Variety C	42	44	41	

Determine whether there is a difference in the three varieties of potatoes at 0.05 level of significance. (8 Marks)

**(QUESTION TWO (20 MARKS))**

a) Briefly explain the common mistakes committed during data gathering and harvesting stage (6 Marks)

b) An experiment is performed to test the effect on corn yield of four different fertilizers A, B, C and D and soil variations in two perpendicular directions. The researcher used latin square design to eliminate the sources of error.

Using ANOVA determine whether there is a difference between an corn yield due to the different fertilizers used (14 Marks)

C <sub>8</sub>	A <sub>10</sub>	D <sub>12</sub>	B <sub>11</sub>
A <sub>14</sub>	C <sub>12</sub>	B <sub>11</sub>	D <sub>15</sub>
D <sub>10</sub>	B <sub>14</sub>	C <sub>16</sub>	A <sub>10</sub>
B <sub>7</sub>	D <sub>16</sub>	A <sub>14</sub>	C <sub>12</sub>

**(QUESTION THREE (20 MARKS))**

a) Randomization is commonly used by researchers when choosing a representative sample from a population.

i) What is randomization? (2 Marks)

ii) State any three methods of randomization commonly used by agricultural researchers (3 Marks)

- b) A researcher wanted to test the effect of different types of fertilizers A,B,C and D on the yield of maize using different types of maize varieties  $\alpha$ ,  $\beta$ ,  $\gamma$  and  $\delta$

$A_\gamma$ 6	$B_\beta$ 12	$C_\delta$ 4	$D_\alpha$ 18
$B_\delta$ 3	$A_\alpha$ 8	$D_\gamma$ 15	$C_\beta$ 14
$D_\beta$ 15	$C_\gamma$ 20	$B_\alpha$ 9	$A_\delta$ 5
$C_\alpha$ 16	$D_\delta$ 6	$A_\beta$ 17	$B_\gamma$ 7

Determine whether there is any significance difference in yield due to

- i) Maize varieties at 0.05 level of significance (12 Marks)  
 ii) Types of fertilizers at 0.01 level of significance (3 Marks)

**QUESTION FOUR (20 MARKS)**

- a) A researcher wanted to test effect of three teaching methods in two different subjects English and Mathematics on four different days of the week.

Determine whether there any significance difference at 0.05 level between the

- i) Teaching methods  
 ii) Subjects (20 Marks)

	ENGLISH				MATHEMATICS			
	MON	TUE	WED	THUR	MON	TUE	WED	THUR
Method A	90	80	77	76	80	75	70	75
Method B	85	70	82	72	70	80	85	73
Method C	80	75	73	80	90	73	74	80