

**FEDERAL UNIVERSITY OF TECHNOLOGY, OWERRI**  
**SCHOOL OF AGRICULTURE AND AGRICULTURAL TECHNOLOGY**  
**DEPARTMENT OF CROP SCIENCE AND TECHNOLOGY**

Course code: CST 515 Title: Field Experimentation (Cr: 2)

SESSION: 2015/2016

HARMATTAN

SEMESTER:

DATE: 14<sup>TH</sup> MAY. 2016

INSTRUCTIONS: ANSWER FIVE QUESTIONS; ONE FROM EACH SECTION AND ANY OTHER ONE.

TIME ALLOWED: 3 HRS.

**SECTION A:**

- (1). A final year student of the Department of Crop Science and Technology, FUTO generated data set from his experiment as shown below:

|      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|
| 0.10 | 1.13 | 1.21 | 1.05 | 1.36 | 0.98 | 1.50 | 0.99 | 0.76 | 0.96 |
|------|------|------|------|------|------|------|------|------|------|

- (a) Use Deviation formula (b) Machine formula to find the variance for the set. (c) Did your result differ? And (d) Why?
- (2a). Explain the term "Treatment" as it relates to field experimentation. Give three examples of quantitative and two qualitative components of treatment.
- (b) Explain the following concepts: Experimental unit and Sampling unit
- (c) What is the relationship between the two concepts in (b) above?

**SECTION B**

- (3). In an experiment where there are two classes of plants; disease resistant and disease susceptible. If the disease resistant plants were 251 and disease susceptible ones 183, determine the whether the number of genes conferring resistance follow a monogenic ratio of 3:1. Use a  $\chi^2$  of 0.5 Edf of 3.84 as the calculated  $\chi^2$ .
- (4a). Explain the following aspects of field plot technique: (i) uniformity of trial, (ii) randomization, (iii) replication and (iv) field layout.
- b) Compare Randomized Complete Block and Latin Square Designs.

**SECTION C**

- (5). Data were collected on number of fruits at harvest for six tomato cultivars and summarized in the Table below. State the appropriate hypotheses, perform an analysis of variance test and test the variety means for significant differences if necessary and interpret your results fully.

| Cultivars | Block I | Block II | Block III | Block IV |
|-----------|---------|----------|-----------|----------|
| Var 1     | 13.5    | 10.3     | 11.8      | 9.4      |
| Var 2     | 5.2     | 7.4      | 6.9       | 4.9      |
| Var 3     | 15.6    | 15.1     | 14.8      | 14.1     |
| Var 4     | 16.9    | 17.7     | 22.6      | 19.1     |
| Var 5     | 3.4     | 5.2      | 6.2       | 5.8      |
| Var 6     | 9.8     | 10.3     | 11.4      | 10.4     |

(6) Analyze the data below, stating the design used and interpret your result fully.

| Factor B | Factor A |      |     |     |
|----------|----------|------|-----|-----|
|          | A_0      | A_1  | A_2 |     |
| B_0      | Blk 1    | 7.1  | 7   | 7.8 |
| B_0      | 2        | 7.1  | 6.7 | 7.8 |
| B_0      | 3        | 7    | 7   | 7   |
| B_1      | Blk 1    | 7.8  | 5   | 8.2 |
| B_1      | 2        | 10.4 | 5   | 8   |
| B_1      | 3        | 9.8  | 5   | 7   |
| B_2      | Blk 1    | 6.8  | 7.1 | 8.2 |
| B_2      | 2        | 7.6  | 9.5 | 8.4 |
| B_2      | 3        | 6.8  | 7.2 | 9.5 |

- (7a). State briefly, the format and structure of writing a research project. (b) State five methods of diagrammatic data presentation by tabulation you know. (c) Explain fully the concept of data presentation by tabulation and state five contents of a tabular data.
- (8a). State four key factors required for successful delivery of a presentation and explain each of these factors (b) State and explain five basic rules required for oral presentation.