

2nd SEM. 2012/2013



**UNIVERSITY OF SWAZILAND
MAIN EXAMINATION PAPER**

COURSE CODE: ABE 305

TITLE OF PAPER: - RESEARCH METHODS

BSc. AGRICULTURAL & BIOSYSTEMS ENGINEERING YEAR 3

TIME ALLOWED: TWO (2) HOURS

SPECIAL MATERIAL REQUIRED: NONE

**INSTRUCTIONS: ANSWER QUESTION ONE AND ANY TWO
OTHER QUESTIONS.**

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GRANTED BY THE CHIEF INVIGILATOR**

SECTION ONE: COMPULSORY

QUESTION 1

- (a) Discuss in detail the procedure for marking out a rectangular experimental plot measuring 5 m long and 3 m wide. **(20 Marks)**
- (b) Briefly discuss the **FIVE** (5) basic characteristics of a well formulated specific research objective. **(10 marks)**
- (c) Contrast the following pairs of terminologies used in research:
- i. Population *versus* population sample,
 - ii. Research problem *versus* research hypothesis,
 - iii. Independent variable *versus* dependent variable,
 - iv. Blocking *versus* replication,
 - v. Methodology *versus* method **(10 Marks)**

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SECTION II: ANSWER ANY TWO QUESTIONS

QUESTION 2

- (a) Describe the following experimental designs indicating the circumstances that would make each design appropriate;
- i. Completely Randomized Design **(5 marks)**
 - ii. Randomized Complete Block Design **(5 Marks)**
 - iii. Split-Plot Design **(5 Marks)**
- (b) Describe **FIVE** (5) fundamentals of research ethics. **(15 Marks)**

QUESTION 3

- (a) Describe the nominal, ordinal and cardinal levels of measurement. **(15 Marks)**
- (b) Giving examples, discuss the differences between fundamental (pure) research and applied research. **(10 Marks)**
- (c) Briefly discuss what you understand by randomisation. **(5 Marks)**

QUESTION 4

- (a) What do you understand by hypothesis in research? **(5 Marks)**
- (b) Giving an example, discuss the main features that a good hypothesis must illustrate. **(15 Marks)**
- (c) List and briefly describe random sampling and stratified random sampling methods used in probability sampling process. **(10 Marks)**