



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT BUILDING AND CIVIL ENGINEERING

**UNIVERSITY EXAMINATION FOR:**

**BSC IN CIVIL ENGINEERING**

**ECE 2409: RESEARCH METHODOLOGY**

**END OF SEMESTER EXAMINATION**

**SERIES: APRIL 2016**

**TIME: 2 HOURS**

**DATE: 13 May 2016**

## **Instructions to Candidates**

You should have the following for this examination

*-Answer Booklet, Drawing Instruments, Scientific calculator, examination pass and student ID*

This paper consists of five questions. Attempt question ONE (Compulsory) and any other TWO questions.

## **SECTION A**

**(COMPULSORY)**

### **QUESTION ONE**

- a) Why is probability sampling generally preferred in comparison to non-probability sampling? Explain the procedure of selecting a stratified random sample. (5 Marks)
- b) Examine the merits and limitations of the observation method in collecting material. Illustrate your answer with suitable examples. (5 Marks)
- c) Discuss the tests of sound measurement. (10 Marks)
- d) State and define FIVE measures of relationships often used in context of research studies. (10 Marks)

## **SECTION B**

**(ANSWER ONE SET OF QUESTIONS ONLY FROM ALL QUESTIONS)**

### **QUESTION TWO**

- I. Classification according to class intervals involves three main problems: How many classes should be there? How to choose class limits? How to determine class frequency? State how these problems should be tackled by a researcher. (10 Marks)

**OR**

- II. Mixed methods involve integration of qualitative and quantitative research and data in a research study. Discuss the different types of Mixed Methods Designs. (10 Marks)

### **QUESTION THREE**

- I. “It is never safe to take published statistics at their face value without knowing their meaning and limitations.” Elucidate this statement by enumerating and explaining the various points which you would consider before using any published data. Illustrate your answer by examples. (10 Marks)

**OR**

- II. A literature review is an integral part of research writing. Reflecting on examples from your own area of interest, explore how you might be able to integrate your research findings with your literature review when it comes to writing your report. (10 Marks)

### **QUESTION FOUR**

- I. Write short notes on the following giving examples in each case: (10 Marks)
- (i) Research design in case of exploratory research studies
  - (ii) Research design in case of descriptive and diagnostic research studies

**OR**

- II. Differentiate between the following research designs: (10 Marks)
- (i) Complex factorial designs

- (ii) Randomized block design
- (iii) Completely randomized design
- (iv) Case study
- (v) Focus groups

### **QUESTION FIVE**

- I. Identify a research problem in Civil Engineering and from it formulate the following: (10 Marks)
- (i) The purpose of the study
  - (ii) A justification for the study
  - (iii) A general objective
  - (iv) Two specific objectives
  - (v) A null hypothesis
  - (vi) An alternate hypothesis
  - (vii) A research design
  - (viii) Method of data analysis

**OR**

- II. Define and give the uses of the following as used in research: ( 10 Marks)
- (i) Parametric tests
  - (ii) Two-way ANOVA
  - (iii) T-test analysis of variance
  - (iv) Chi-square
  - (v) Confidence levels