



## **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**

- Differentiate between a research proposal and a project proposal. (4 Marks)
- Define any THREE issues which should receive the attention of the researcher in formulating a research problem. Give suitable examples to elucidate your points. (6 Marks)
- What are the guiding considerations in the construction of a questionnaire? (4 Marks)
- “Measurement should be precise and unambiguous in an ideal research study. As such the researcher must be aware about the sources of error in measurement.” Discuss. (8 Marks)

- e) Define the term ethics as used in research and highlight the ethical issues to be considered when carrying out your final year project. (8 Marks)

## **SECTION B**

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

### **QUESTION TWO**

- I. The last step in the research process is writing the research report. Discuss the FIVE steps involved in writing a research report. (10 Marks)

**OR**

- II. (a) Identify a situation relating to Civil Engineering where you think qualitative study designs might be more beneficial and give THREE reasons why this might be the case. (4 Marks)

(b) In the absence of a sampling frame for employees of a large organisation, which sampling design would you use to select a sample of 200 people? Explain why you would choose this design and the process you would undertake to ensure that the sample is representative. (6 Marks)

### **QUESTION THREE**

- I. In relation to your final year project, formulate a research topic and discuss the FOUR steps involved in conducting a literature review. (10 Marks)

**OR**

- II. There is a considerable overlap in the methods of data collection between quantitative and qualitative research. In spite of that they are different. Discuss the factors that differentiate them and those that make them similar. (10 Marks)

### **QUESTION FOUR**

- I. (a) Differentiate between processing and analysis of data. (2 Marks)

(b) "Processing of data implies editing, coding, classification and tabulation". Describe in brief these FOUR operations in context of research study. (8 Marks)

**OR**

- II. (a) How will you differentiate between descriptive statistics and inferential statistics? Give examples (4 Marks)

(b) Giving an example from the Civil Engineering field, consider the advantages and disadvantages of having used open-ended or closed questions when you come to processing of your data. (6 Marks)

### **QUESTION FIVE**

- I. (a) Define the term ‘representative samples’ as used in sampling designs and give the potential consequences of unrepresentative sampling. (6 Marks)  
(b) Differentiate between internal and external validity as used in research giving relevant examples in each case. (4 Marks)

**OR**

- II. 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