



TECHNICAL UNIVERSITY OF MOMBASA

School of Engineering and Technology

Department of Electrical and Electronic Engineering

UNIVERSITY EXAMINATION FOR:

Bachelor of Technology in Electrical and Electronic Engineering

TEE 4308 Engineering Research Methods

END-OF-SEMESTER EXAMINATION

SERIES: APRIL 2025

TIME: 2 HOURS

DATE: April 2025

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **five** Questions; Answer questions ONE and any TWO Questions.

Do not write on the question paper.

QUESTION ONE

- a) Define the following terms: research, research methods, research methodology, and scientific method. [5 marks]
- b) Outline five key characteristics of research. [2.5 marks]
- c) Differentiate between qualitative and quantitative research. [5 marks]
- d) A researcher is investigating the effects of social media on students' academic performance. Discuss two appropriate research techniques they could use, explaining their suitability for the study. [3.5 marks]
- e) A research team is conducting a study on customer satisfaction in retail stores. They decide to use both qualitative and quantitative research techniques. Justify their decision and describe how they can effectively integrate the two methods. [4 marks]

Question TWO

- a) A researcher wants to investigate the impact of remote learning on student performance. Describe four key steps they must follow in the research process to ensure reliable and valid results.

[4 marks]

- b) Discuss the significance of a well-structured research process in producing credible and impactful research outcomes. Provide two key reasons. [4 marks]
- c) Ethical considerations are crucial in research to protect participants and maintain integrity. Discuss three key ethical issues researchers must address and explain their significance. [6 marks]
- d) The Ethics Review Committee (ERC) plays a vital role in ensuring ethical compliance in research. Explain three key functions of the ERC in overseeing research activities. [6 marks]

Question THREE

- a) Research design is a crucial framework that guides a study's methodology. Discuss three key factors that influence the choice of a research design and explain their significance. [6 marks]
- b) Sampling design plays a critical role in research accuracy and reliability. Discuss three key factors that influence the selection of a sampling design and explain their significance. [6 marks]
- c) Data collection is a critical component of research. Define primary and secondary data, describe two key methods of data collection, and discuss three factors that influence the choice of a data collection method. [8 marks]

Question FOUR

- a) Data collection tools are essential in research. Define three key terms related to data collection tools, describe the process of developing a data collection tool, and outline two critical factors to consider when selecting a data collection tool. [7 marks]
- b) A research proposal is a critical document in academic and professional research. Explain the concept of a research proposal, outline its main purpose, describe three key components, and briefly develop a research proposal title and problem statement. [7 marks]
- c)
 - i) Define the terms "data processing" and "data analysis," and explain how they relate to research.
 - ii) Describe the key steps involved in the data analysis process. [6 marks]

Question FIVE

- a)
 - i) Explain the concept and purpose of research findings dissemination.
 - ii) Describe two types of research dissemination methods and explain how they can be applied effectively. [8 marks]
- b) Explain the key factors to consider when selecting an appropriate research findings dissemination method and justify their importance. [6 marks]
- c) Explain how to ensure the reliability and validity of research findings. (6 Marks)