BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE AND ENGINEERING

DEPARTMENT OF STATISTICS AND MATHEMATICS

SFM211:   **RESEARCH METHODS**

APR 2025

DURATION: **3 HOURS**

EXAMINATION

INSTRUCTIONS TO CANDIDATES

1. Answer any **FOUR** questions from any of the **FIVE** questions.
2. **Each** question carries a total of **25 marks**.

Question 1

(a) Define and explain the term "Scientific Research".   [3]

(b) Explain the difference between Research Methodology and Research Methods.   [5]

(c) Explain the difference between quantitative and qualitative research design.   [5]

(d) There are five types of research designs namely: descriptive, correlational, experimental, diagnostic and explanatory research design. Give a detailed explanation of each.   [12]

Question 2

(a) State the purposes of the following in a research paper:
    (i) Abstract   [3]
    (ii) Literature Review   [4]
    (iii) Problem statement   [3]

(b) We can differentiate four types of study designs based on participant grouping namely: cohort, cross-sectional, longitudinal and cross-sequential. Give a detailed explanation of each of the study designs.   [15]

Question 3

    (a) What are the 5 key principles of data?   [10]

    (b) Three main potential errors that affect validity of research findings are: bias, confounding and chance. Give a detailed explanation of each.   [12]

    (c) How do we minimize such potential errors in research?   [3]

Question 4

    (a) What is the difference between Descriptive and Inferential statistics?   [10]

    (b) Explain the importance of research ethics in research?   [15]

Question 5

    (a) Explain why sampling is important when conducting research?   [2]

    (b) What is the difference between probability sampling and non-probability sampling?   [3]

    (c) The "School Compost Project" was launched in 2024 in secondary schools in Zimbabwe with the objective of making the awareness of how to make use of biodegradable waste in a profitable way. Explain how you would select a sample of secondary school students for the purpose of eliciting their views on the "School Compost Project" by

        i.   Simple random sampling   [4]

        ii.   Systematic sampling   [5]

        iii.   Cluster sampling   [5]

    (d) Elaborate on the statistical efficiency of each of the sampling methods stated in (c)   [6]

END OF EXAMINATION