NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCE

DEPARTMENT OF INFORMATICS AND ANALYTICS

BIG DATA SCIENCE RESEARCH METHODS (SIDS 5104)

Main Examination Paper

First Semester 2024

This Examination Paper consists of 3 pages

Time Allowed:	3 hours
Total Marks:	100
Special Requirements:	N/A
Internal Examiner:	Professor. S. Dube
External Examiner:	Dr. LC Sakala

INSTRUCTIONS

1. Answer any **Four** questions.

2. Each question carries 25 marks

MARK ALLOCATION

QUESTION	MARKS
1.	25
2.	25
3.	25
4.	25
TOTAL	

Question 1

Identify a Data Science-related topic of your choice and discuss the following:

    a. State the problem solved by your research.   [5]
    b. Define the aim and objectives or research questions or hypothesis for your research.   [5]
    c. Describe the software development methodology for your research.   [5]
    d. Explain the anticipated findings from your research   [5]
    e. Evaluate the potential contribution of your research.   [5]

Question 2

    a. Explain any **Six** characteristics of a clean dataset.   [13]
    b. Data analysis follows several steps, discuss how the following steps can be applied in a big data science research project
    :

        I.   Data wrangling.   [4]
        II.   Data segmentation.   [4]
        III.   Data visualization.   [4]

Question 3

Use examples to demonstrate how the following types of data analysis are applied in a big data science research project:

    I.   Regression analysis.   [5]
    II.   Descriptive analysis.   [5]
    III.   Diagnostic analysis.   [5]
    IV.   Predictive analysis.   [5]
    V.   Prescriptive analysis.   [5]

Question 4

Explain how the following instruments can be used to collect data for a big data science research:

    a. Questionnaires.   [5]
    b. Observations.   [5]
    c. Focus group discussions.   [5]
    d. Interviews.   [5]
    e. Document analysis.   [5]

Question 5

Use examples to justify the applicability of the following sampling techniques:
  I.   Random sampling.   [5]
  II. Snow ball sampling.   [5]
  III. Purposive sampling.   [5]
  IV. Quota sampling.   [5]
  V.   Stratified sampling.   [5]

END OF QUESTION P