BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE AND ENGINEERING

COMPUTER SCIENCE DEPARTMENT

BSc HONORS DEGREE IN COMPUTER SCIENCE / INFORMATION TECHNOLOGY / NETWORK ENGINEERING / SOFTWARE ENGINEERING

RESEARCH METHODOLOGY - CS206/NWE206/SWE206

2 ½ HOURS   ≈ NOV 2024

INSTRUCTION TO CANDIDATES

This paper carries **five (5)** questions. Answer **ALL.**

Marks are indicated in brackets at the end of each question. Total marks are **100**.

Question 1

(a) Explain what a statement of the problem entail in research?   **[8]**

(b) Point out two differences between the following.

   (i) Probability Sampling and Non-probability Sampling.   **[4]**

   (ii) Cluster Sampling and Stratified Sampling.   **[4]**

   (iii) Sample and Population.   **[4]**

Question 2

(a) Define Hypothesis in Research and give an example of Null Hypothesis (H_0) and Alternative Hypothesis (H_1)   **[5]**

(b) In a pandemic-ridden environment, researchers have resorted to using various Information and Communication Technologies (ICTs) for research data collection. Describe any **five (5)** ICT-based mechanisms that can be used to administer data collection.   **[15]**

Question 3

Research can be undertaken through a systematic review. How does a systematic review of literature conducted in computer science. **[20]**

Question 4

(a) What does 99% confidence interval mean? **[2]**

(b) Using at least two sketch diagrams show how 99% confidence interval is represented for a one-tail test and for a two-tail test. **[4]**

(c) Is a correlation of -5 weaker than a correlation of +5? Explain what a correlation of -5 and +5 mean to you **[4]**

(d) What does the p-value represent in statistical tests? **[4]**

(e) Using practical examples, give two situations when regression analysis is applied when analysing data. **[6]**

Question 5

The Fourth Industrial Revolution (4IR) comes with research in Big Data Analytics including Machine Learning and Deep Learning application. These research require use of data a mining framework such as the Industry Standard Process for Data Mining (CRISP-DM).

Prove your understanding of the CRISP-DM. **[20]**

********END OF PAPER*******