BINDURA UNIVERSITY OF SCIENCE EDUCATION

Faculty of Science Education

Programme: Postgraduate Diploma in Education

Post Graduate Diploma in Higher Education

JAN 2025

Course: PC503/PHE 504 Research Methods and Statistics

Semester Examinations Time: 3 Hours

Instructions

(i). Answer **three questions** citing specific exemplifications from subject area.

(ii). Choose at least one question from each section.

(iii). Begin each question on a fresh page and number your work correctly

SECTION A: RESEARCH METHODS

A1. Discuss five components of the methodology section of a research report. **[25]**

A2. (a) Distinguish between correlational and experimental research designs. **[5]**

(b) Discuss the importance of a detailed Theoretical Framework in research. **[20]**

A3. (a) Distinguish between positivist and interpretive research paradigms. **[12]**

(b) Evaluate the assertion that: in the qualitative paradigm the researcher is the chief research instrument. **[13]**

SECTION B: STATISTICS

B4. (a). Distinguish between parameters and statistics. **[4]**

(b). Define correlation and describe three characteristics of correlational measures. **[5]**

(c). A college lecturer claims that a student's performance in Research Methods is related to the score obtained in the research project. For $n = 10$ students, the lecturer recorded the following marks.

Research Methods Mark	55	78	61	79	76	67	58	81	68	74
Dissertation Mark	61	73	70	83	69	72	63	74	66	80

(i). For these data calculate the Pearson product moment correlation coefficient. **[7]**

(ii). Interpret your findings. **[5]**

(iii). Describe two limitations of measures of association. **[4]**

B5. (a). One assumption for parametric tests with independent measures data is that the different treatment conditions have the same variance (homogeneity of variance assumption). However, a treatment effect that increases the mean will often also increase the variability. In this situation the parametric t test or ANOVA, F, test is not justified and a Mann-Whitney test should be used. The following data represent an example of this situation.

Treatment 1 (Sample A)	Treatment 2 (Sample 2)
1	8
5	20
0	14
2	27
4	6
2	10
3	19

(i). Compute the mean and variance for each sample.

(ii). Use a Mann-Whitney test, with $\alpha = 0.05$ to test for the significant difference between the two treatments. **[15]**

END OF PAPER