

UNIVERSITY OF SWAZILAND
FACULTY OF EDUCATION
SUPPLEMENTARY EXAMINATIONS 2005

**TITLE OF PAPER : RESEARCH METHODS AND
EVALUATION**

PROGRAMME : BED III

COURSE NUMBER : EDF 320 PAPER 1

TIME ALLOWED : THREE (3) HOURS

INSTRUCTIONS:

1. This paper is in two parts.
2. Answer all items in section one by putting a circle around the correct response on the answer card provided.
3. You are advised to spend not more than 45 minutes in this section.
4. Answer question one, and any TWO other questions from Section B.
5. Answer cards, formula sheets and the necessary tables are also provided.

THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION TO DO SO, HAS BEEN GRANTED BY THE INVIGILATOR.

1. If a researcher uses the minutes of meetings of directors to find out information about the organization, the minutes are considered a/an
 - a. preliminary source
 - b. secondary source
 - c. authentic source
 - d. reliable source
 - e. primary source

2. What valuable purpose does scientific hypothesis serve?
 - a. it can never be changed
 - b. it reveals the absolute truth
 - c. it is used to validate an experiment
 - d. it provides a basis for testable predictions
 - e. it is a complete presentation of the real world

3. One of the following is usually derived from a population
 - a. statistics
 - b. generalization
 - c. parameter
 - d. justification
 - e. sample

4. Which of these is most likely to be viewed as primary source of data?
 - a. someone who was present when the event took place
 - b. an account of someone who talked to the actual observer of the event
 - c. someone who read about the event from an international newspaper
 - d. someone who read a book about the event
 - e. someone who claims that the story has been passed to him through family members

5. A scale with no absolute zero is termed
 - a. summation scale
 - b. ratio scale
 - c. ordinal scale
 - d. interval scale
 - e. weighing scale

6. Intensive examination of a single individual is the objective of
 - a. the survey
 - b. naturalistic observation
 - c. the case study
 - d. experimentation
 - e. researchers and practitioners

7. In a longitudinal study, what is the most important variable?
- acquisition of new knowledge by the researcher
 - change brought about by time
 - change in sample size
 - change in the skills acquired by the researchers
 - change in the composition of the research team
8. Which is the most appropriate explanation of a dependent variable?
- the variable that the researcher is interested in explaining
 - the variable that has a positive effect on another variable
 - a variable that causes another variable
 - a variable that has both a positive and negative effect on another variable
9. Which one of the following does/do not belong to this group?
- the number of tiles in the classroom
 - the distance between two villages
 - the number of cars in a parking lot
 - the height of the building
 - b and d.
10. What is the main weakness of a mail questionnaire?
- it is expensive to send by post
 - it has a low response rate
 - it can only be sent to a limited sample
 - it does not allow the researcher to meet the respondents
 - those who cannot read ask others to respond on their behalf
11. The collection of data for an investigation
- requires a lot of patience and careful thinking
 - is to be done at the beginning of the investigation
 - is the beginning of the analysis of data
 - is putting the data collected in usable form

Which of the above are true of research or investigation?

- (iii)
- (ii) and (iii)
- (i)
- (iv), (ii) and (iii)
- (ii) and (i)

12. In the following sequence of events, what is the appropriate name for variable 2? *Sphiwe goes to a private school (1) which gives a lot of homework (2) to the children and her school performance is good (3).*
- an independent variable
 - a dependent variable
 - an intervening variable
 - an antecedent variable
 - an observable variable
13. The following are a function of theory except
- serving as a scientific method
 - acting as a predictor
 - guiding further research
 - providing an accurate view of behaviour
 - functioning as a null hypothesis
14. Which research method would be most appropriate to study the behaviour patterns of Swazi men living in rural areas towards the use of herbal medicine?
- desk study
 - follow up study
 - archival study
 - ethnographic study
 - observational study
15. Which of the following would you use to develop a histogram?
- the mid point of the grouped data and upper class boundary
 - the cumulative frequencies and lower class boundary
 - the cumulative proportion and the cumulative percentage
 - the mid point of the grouped data and frequencies
 - the mid point of the grouped data and the cumulative proportion
16. If you fail to accept a null hypothesis what would be your next step?
- draw a conclusion of the findings
 - discard the research
 - accept the alternative hypothesis
 - change the null hypothesis
 - reject the null hypothesis
17. One major reason why the survey method is often used is that
- it takes into account the population size
 - data is easy to quantify
 - results can be easily generalized
 - it opens room for further research
 - it requires limited skills from the researcher

18. Which of the following is not true about the scientific method?
- it best applies in the natural sciences
 - it involves the formation of a hypothesis
 - extensive experimentation is used to falsify the hypothesis
 - it involves developing a reasonable theory to explain an observation
 - the potency of a hypothesis lies in its ability to predict observation
19. What is the purpose of a control experiment?
- to determine the effect of one variable
 - to trace any changes in the intervening variable
 - to provide meaning so that results can be interpreted
 - to take into account factors that interfere with variables in the study
 - to satisfy the requirements of standard writing procedures in presenting scientific information
20. One major reason for conducting research is to
- learn new research skills
 - extend the boundaries of knowledge
 - verify what others have already found out
 - apply one's research skills
 - dispute what others have found out.
21. If a distribution of scores can be divided into two equal parts from its apex, how would you describe such a curve?
- a skewed curve
 - a median curve
 - a negative skewed curve
 - a bell shaped curve
 - a mesokurtic curve
22. Which statistical measure has equal number of scores on either sides of it?
- the variance
 - the mode
 - the standard deviation
 - the mean
 - the median
23. Which measure of central tendency fluctuates more than others?
- the mode
 - the range
 - the mean
 - the deviation scores
 - the median

24. The square root of the variance is the
- semi-inter-quartile range
 - deviation scores
 - the range
 - standard deviation
 - mean
25. When a researcher lives with a group of people to study their way of life, this is called
- natural observation
 - subject observation
 - informal observation
 - behavioural observation
 - participant observation
26. Mrs Sikhondze is writing her daily observations of a student and records what she sees without interpretation. She notes that the student is not completing the class work and is constantly speaking out of turn. Which of the following techniques does she appear to be using?
- descriptive
 - explanation
 - experimentation
 - exploration
 - prediction
27. The use of controlled environment is most characteristic of
- naturalistic observation
 - testing
 - case study
 - experimentation
 - historical research
28. Which of the following is a form of research typically conducted by teachers, to answer questions they have and to specifically help them solve local problems?
- action research
 - basic research
 - predictive research
 - orientation research
 - analytic research

SECTION B

INSTRUCTIONS:

(I) ANSWER QUESTION ONE AND ANY 3 (TWO OTHER QUESTIONS FROM THIS SECTION).

(II) EACH QUESTION MUST BE ANSWERED ON A SEPARATE BOOKLET.

1. a) A researcher used a split-half method to test for reliability. The correlation Coefficient derived from the two halves was 0.55. Determine the actual reliability coefficient for the full test. 15 marks
- b) To what extent would you rely on the full test? 3 marks
- c) Explain your position 6 marks
(24 MARKS)
2. Explain three characteristics of each of the following research methods.
 - a) Casual - comparative research
 - b) Action research
 - c) Case study research (24 MARKS)
3. a. Using appropriate examples, distinguish between a hypothesis and a theory in scientific method. 6 marks
- b. How can a theory lead to a hypothesis? 6 marks
- c. How reliable and valid is the knowledge developed through the scientific method? 12 marks
(24 MARKS)
4. (A) Using any three suitable illustrations, discuss the importance of reviewing literature in research. 18 marks
- (B) If there was no literature about the research you want to conduct, what would you do? Justify your position. 6 marks
(24 MARKS)

SECTION B

INSTRUCTIONS:

(I) ANSWER QUESTION ONE AND ANY 3 (TWO OTHER QUESTIONS FROM THIS SECTION.

(II) EACH QUESTION MUST BE ANSWERED ON A SEPARATE BOOKLET.

1. a) A researcher used a split-half method to test for reliability. The correlation Coefficient derived from the two halves was 0.55. Determine the actual reliability coefficient for the full test. 15 marks
- b) To what extent would you rely on the full test? 3 marks
- c) Explain your position 6 marks
(24 MARKS)
2. Explain three characteristics of each of the following research methods.
 - a) Casual - comparative research
 - b) Action research
 - c) Case study research **(24 MARKS)**
3. a. Using appropriate examples, distinguish between a hypothesis and a theory in scientific method. 6 marks
- b. How can a theory lead to a hypothesis? 6 marks
- c. How reliable and valid is the knowledge developed through the scientific method? 12 marks
(24 MARKS)
4. (A) Using any three suitable illustrations, discuss the importance of reviewing literature in research. 18 marks
- (B) If there was no literature about the research you want to conduct, what would you do? Justify your position. 6 marks
(24 MARKS)

A P P E N D I X A

df	.1	.05	.01	.001
1	6.314	12.706	63.657	636.619
2	2.920	4.303	9.925	31.598
3	2.353	3.182	5.841	12.941
4	2.132	2.776	4.604	8.601
5	2.015	2.571	4.032	6.859
6	1.943	2.447	3.707	5.959
7	1.895	2.365	3.499	5.405
8	1.860	2.306	3.355	5.041
9	1.833	2.262	3.250	4.781
10	1.812	2.228	3.169	4.587
11	1.796	2.201	3.106	4.437
12	1.782	2.179	3.055	4.318
13	1.771	2.160	3.012	4.221
14	1.761	2.145	2.972	4.140
15	1.753	2.131	2.947	4.073
16	1.746	2.120	2.921	4.015
17	1.740	2.110	2.898	3.965
18	1.734	2.101	2.878	3.922
19	1.729	2.091	2.861	3.883
20	1.725	2.086	2.845	3.850
21	1.721	2.080	2.831	3.819
22	1.717	2.074	2.819	3.792
23	1.714	2.069	2.807	3.767
24	1.711	2.064	2.797	3.745
25	1.708	2.060	2.787	3.725
26	1.706	2.056	2.779	3.707
27	1.703	2.052	2.771	3.690
28	1.701	2.048	2.763	3.674
29	1.699	2.045	2.756	3.659
30	1.697	2.042	2.750	3.646
40	1.684	2.021	2.704	3.551
60	1.671	2.000	2.660	3.460
120	1.658	1.980	2.617	3.373
α	1.645	1.960	2.576	3.291

SOURCE: APPENDIX C from Downie, N.M., and Heath, R.M. Basic Statistical Methods, N.Y.; Harper & Row, Publishers, 1974.

STATISTICAL FORMULAE

$$(1) \bar{X} = \frac{\sum X}{N}$$

$$(2) \bar{X} = M' = \frac{\sum fx'}{N} (i)$$

$$(3) x = X - \bar{X}$$

$$(4) ss = \sqrt{\frac{\sum x^2}{N}} \text{ or } \sqrt{\frac{\sum x^2}{N-1}}$$

$$(5) s^2 = \frac{\sum x^2}{N} \text{ or } \frac{\sum x^2}{N-1}$$

$$(6) \sum x^2 = i^2 \left[\sum f(x')^2 - \frac{\sum (fx')^2}{N} \right]$$

$$(7) s = \sqrt{\frac{\sum X^2}{N} - (\bar{X})^2}$$

$$(8) s = \frac{1}{N} \sqrt{N \sum X^2 - (\sum X)^2}$$

$$(9) Q = \frac{(Q_3 - Q_1)}{2}$$

$$(10) z\text{-score} = X - \bar{X} / s$$

$$(11) T\text{-score} = 10z + 50$$

$$(12) r = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{[N \sum X^2 - (\sum X)^2][N \sum Y^2 - (\sum Y)^2]}}$$

$$(13) r = \frac{\sum \bar{x}y}{\sqrt{(\sum x^2)(\sum y^2)}}$$

$$(14) r = \frac{\sum z_x z_y}{N}$$

$$(15) r_{pb} = \frac{\bar{X}_y - \bar{X}_t}{s_t} \left(\sqrt{\frac{p}{q}} \right)$$

$$(15) r_{12.3} = \frac{r_{12} - (r_{13}r_{23})}{\sqrt{(1-r_{13}^2)(1-r_{23}^2)}}$$

$$(16) b_{yx} = \frac{\sum XY - [(\sum X)(\sum Y)/N]}{\sum X^2 - [(\sum X)^2/N]}$$

$$(17) a_{yx} = \bar{Y} - b_{yx}\bar{X}$$

$$(18) b_{xy} = \frac{\sum XY - [(\sum X)(\sum Y)/N]}{\sum Y^2 - [(\sum Y)^2/N]}$$

$$(19) a_{xy} = \bar{X} - b_{xy}\bar{Y}$$

$$(20) s_{xy} = \sqrt{(\sum Y - \bar{Y})^2 / (N-1)}$$

$$(21) \text{student } -t = \frac{r\sqrt{N-2}}{\sqrt{1-r^2}}$$

$$(22) Y' = a + b_1X_1 + b_2X_2 + b_3X_3$$

$$(23) F_{n_1-1, n_2-1} = \frac{S_g^2}{S_l^2}$$

$$(24) t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$$(25) t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{\sum x_1^2 + \sum x_2^2}{n_1 + n_2 - 2}\right) \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$26. \chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

$$27. \text{TOTAL}_{ss} = \sum X^2 - \frac{(\sum X)^2}{n}$$

$$\text{WITHIN}_{ss} = \sum \sum X^2 - \frac{\sum (X)^2}{n}$$

$$31. df_t = (n-1)$$

$$32. df_b = (k-1)$$

$$33. df_w = (n-k)$$

$$MS_{SS} = \frac{SS_b}{df_b}$$

$$34. MS_b = \frac{SS_w}{df_w}$$

$$35. F = \frac{MS_b}{MS_w}$$

$$(15) r_{12.3} = \frac{r_{12} - (r_{13}r_{23})}{\sqrt{(1-r_{13}^2)(1-r_{23}^2)}}$$

ANSWER CARD

IDENTIFICATION NO.....

COURSE NO.: E D F.....

- | | | | | | | | | | | | |
|-----|---|---|---|---|---|-----|---|---|---|---|---|
| 1. | A | B | C | D | E | 2. | A | B | C | D | E |
| 3. | A | B | C | D | E | 4. | A | B | C | D | E |
| 5. | A | B | C | D | E | 6. | A | B | C | D | E |
| 7. | A | B | C | D | E | 8. | A | B | C | D | E |
| 9. | A | B | C | D | E | 10. | A | B | C | D | E |
| 11. | A | B | C | D | E | 12. | A | B | C | D | E |
| 13. | A | B | C | D | E | 14. | A | B | C | D | E |
| 15. | A | B | C | D | E | 16. | A | B | C | D | E |
| 17. | A | B | C | D | E | 18. | A | B | C | D | E |
| 19. | A | B | C | D | E | 20. | A | B | C | D | E |
| 21. | A | B | C | D | E | 22. | A | B | C | D | E |
| 23. | A | B | C | D | E | 24. | A | B | C | D | E |
| 25. | A | B | C | D | E | 26. | A | B | C | D | E |
| 27. | A | B | C | D | E | 28. | A | B | C | D | E |

A P P E N D I X A

df	.1	.05	.01	.001
1	6.314	12.706	63.657	636.619
2	2.920	4.303	9.925	31.598
3	2.353	3.182	5.841	12.941
4	2.132	2.776	4.604	8.601
5	2.015	2.571	4.032	6.859
6	1.943	2.447	3.707	5.959
7	1.895	2.365	3.499	5.405
8	1.860	2.306	3.355	5.041
9	1.833	2.262	3.250	4.781
10	1.812	2.228	3.169	4.587
11	1.796	2.201	3.106	4.437
12	1.782	2.179	3.055	4.318
13	1.771	2.160	3.012	4.221
14	1.761	2.145	2.972	4.140
15	1.753	2.131	2.947	4.073
16	1.746	2.120	2.921	4.015
17	1.740	2.110	2.898	3.965
18	1.734	2.101	2.878	3.922
19	1.729	2.091	2.861	3.883
20	1.725	2.086	2.845	3.850
21	1.721	2.080	2.831	3.819
22	1.717	2.074	2.819	3.792
23	1.714	2.069	2.807	3.767
24	1.711	2.064	2.797	3.745
25	1.708	2.060	2.787	3.725
26	1.706	2.056	2.779	3.707
27	1.703	2.052	2.771	3.690
28	1.701	2.048	2.763	3.674
29	1.699	2.045	2.756	3.659
30	1.697	2.042	2.750	3.646
40	1.684	2.021	2.704	3.551
60	1.671	2.000	2.660	3.460
120	1.658	1.980	2.617	3.373
α	1.645	1.960	2.576	3.291

SOURCE: APPENDIX C from Downie, N.M., and Heath, R.M. Basic Statistical Methods, N.Y.; Harper & Row, Publishers, 1974.

STATISTICAL FORMULAE

$$(1) \bar{X} = \frac{\sum X}{N}$$

$$(2) \bar{X} = M' = \frac{\sum fx'}{N} \quad i$$

$$(3) x = X - \bar{X}$$

$$(4) .ss = \sqrt{\frac{\sum x^2}{N}} \text{ or } \sqrt{\frac{\sum x^2}{N-1}}$$

$$(5) s^2 = \frac{\sum x^2}{N} \text{ or } \frac{\sum x^2}{N-1}$$

$$(6) \sum x^2 = i^2 \left[\sum f x'^2 - \frac{\sum fx'^2}{N} \right]$$

$$(7) s = \sqrt{\frac{\sum X^2}{N} - \bar{X}^2}$$

$$(8) s = \frac{1}{N} \sqrt{N \sum X^2 - \sum X^2}$$

$$(9) Q = \frac{Q_3 - Q_1}{2}$$

$$(10) z\text{-score} = \frac{X - \bar{X}}{s}$$

$$(11) T\text{-score} = 10z + 50$$

$$(12) r = \frac{N \sum XY - \sum X \sum Y}{\sqrt{[N \sum X^2 - (\sum X)^2][N \sum Y^2 - (\sum Y)^2]}}$$

$$(13) r = \frac{\sum xy}{\sqrt{(\sum x^2)(\sum y^2)}}$$

$$(14) r = \frac{\sum z_x z_y}{N}$$

$$(15) r_{pb} = \frac{\bar{X}_y - \bar{X}_i}{s_i} \left(\sqrt{\frac{p}{q}} \right)$$

$$(16).b_{yx} = \frac{\sum XY - [(\sum X)(\sum Y)/N]}{\sum X^2 - [(\sum X)^2/N]}$$

$$(17).a_{yx} = \bar{Y} - b_{yx}\bar{X}$$

$$(18).b_{xy} = \frac{\sum XY - [(\sum X)(\sum Y)/N]}{\sum Y^2 - [(\sum Y)^2/N]}$$

$$(19).a_{xy} = \bar{X} - b_{xy}\bar{Y}$$

$$(20).s_{xy} = \sqrt{(\sum Y - \bar{Y})^2 / (N-1)}$$

$$(21).student-t = \frac{r\sqrt{N-2}}{\sqrt{1-r^2}}$$

$$(22).Y' = a + b_1X_1 + b_2X_2 + b_3X_3$$

$$(23).F_{n_1-1, n_2-1} = \frac{S_g^2}{S_l^2}$$

$$(24).t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$$(25).t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{\sum x_1^2 + \sum x_2^2}{n_1 + n_2 - 2}\right)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$26.x^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

$$27.TOTAL_{ss} = \sum X^2 - \frac{(\sum X)^2}{n}$$

$$WITHIN_{ss} = \sum \sum X^2 - \frac{\sum (X)^2}{n}$$

$$31. df_t = n - 1$$

$$32. df_b = k - 1$$

$$33. df_w = n - k$$

$$MS_b = \frac{SS_b}{df_b}$$

$$34. MS_w = \frac{SS_w}{df_w}$$

$$35. F = \frac{MS_b}{MS_w}$$

$$(15) r_{12.3} = \frac{r_{12} - r_{13}r_{23}}{\sqrt{1 - r_{13}^2} \sqrt{1 - r_{23}^2}}$$

ANSWER CARD

IDENTIFICATION NO.....

COURSE NO.: E D F.....

- | | | | | | | | | | | | |
|-----|---|---|---|---|---|-----|---|---|---|---|---|
| 1. | A | B | C | D | E | 2. | A | B | C | D | E |
| 3. | A | B | C | D | E | 4. | A | B | C | D | E |
| 5. | A | B | C | D | E | 6. | A | B | C | D | E |
| 7. | A | B | C | D | E | 8. | A | B | C | D | E |
| 9. | A | B | C | D | E | 10. | A | B | C | D | E |
| 11. | A | B | C | D | E | 12. | A | B | C | D | E |
| 13. | A | B | C | D | E | 14. | A | B | C | D | E |
| 15. | A | B | C | D | E | 16. | A | B | C | D | E |
| 17. | A | B | C | D | E | 18. | A | B | C | D | E |
| 19. | A | B | C | D | E | 20. | A | B | C | D | E |
| 21. | A | B | C | D | E | 22. | A | B | C | D | E |
| 23. | A | B | C | D | E | 24. | A | B | C | D | E |
| 25. | A | B | C | D | E | 26. | A | B | C | D | E |
| 27. | A | B | C | D | E | 28. | A | B | C | D | E |
| 29. | A | B | C | D | E | 30. | A | B | C | D | E |
| 31. | A | B | C | D | E | 32. | A | B | C | D | E |
| 33. | A | B | C | D | E | 34. | A | B | C | D | E |
| 35. | A | B | C | D | E | 36. | A | B | C | D | E |
| 37. | A | B | C | D | E | 39. | A | B | C | D | E |
| 39. | A | B | C | D | E | 40. | A | B | C | D | E |