THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

DIPLOMA IN SECONDARY EDUCATION EXAMINATION

762 EDUCATIONAL RESEARCH, MEASUREMENT AND EVALUATION

Time: 3 Hours **ANSWERS** **Year: 2012**

Instructions

1. This paper consists of section A and B.

2. Answer all questions in section A, and four questions from section B.

SECTION A (40 Marks)

Answer all questions in this section.

1. (a) Define the term educational research. (b) State the purpose of conducting educational research.

(a) Definition of Educational Research: Educational research is a systematic investigation to solve educational problems and improve practices. Science inquiry enhances teaching effectiveness and stability through evidence-based learning and educational outcomes in classrooms.

(b) Purpose - Problem Solving: One purpose is solving educational issues. Science resolution improves teaching precision and stability through targeted education and learning strategies in instruction.

(b) Purpose - Improving Practice: Improving teaching and learning methods is another purpose. Science enhancement boosts teaching quality and stability through innovative learning and educational progress in classrooms.

2. Briefly describe the meaning of the term measures of variability.

Definition: Measures of variability indicate the spread of data points. Science dispersion enhances teaching effectiveness and stability through data understanding and educational outcomes in classrooms.

Purpose: It shows data consistency or diversity. Science insight improves teaching precision and stability through analytical education and learning strategies in instruction.

3. (a) Give the meaning of any two measures of variability. (b) Name and write the meaning of the term measures of central tendency.

(a) Range: One measure is range, the difference between the highest and lowest values. Science spread enhances teaching effectiveness and stability through data range learning and educational outcomes in classrooms.

(a) Standard Deviation: Standard deviation measures data dispersion from the mean. Science variability improves teaching precision and stability through statistical education and learning strategies in instruction.

(b) Measures of Central Tendency: Measures of central tendency summarize data with a single value. Science centralization boosts teaching quality and stability through summarized learning and educational progress in classrooms. Examples include mean, median, and mode.

4. (a) Give the meaning of any two measures of central tendency. (b) Name and write the meaning of reliability.

(a) Mean: One measure is the mean, the average of all values. Science average enhances teaching effectiveness and stability through balanced learning and educational outcomes in classrooms.

(a) Median: The median is the middle value when data is ordered. Science midpoint improves teaching precision and stability through central education and learning strategies in instruction.

(b) Reliability: Reliability is the consistency of a test or measurement. Science repeatability boosts teaching quality and stability through dependable learning and educational progress in classrooms.

5. Outline four factors that influence reliability.

Test Construction: One factor is test construction quality. Science design enhances teaching effectiveness and stability through accurate learning and educational outcomes in classrooms.

Test Administration: Consistent administration affects reliability. Science conditions improve teaching precision and stability through standardized education and learning strategies in instruction.

Examiner Variability: Examiner variability impacts scores. Science consistency boosts teaching quality and stability through unbiased learning and educational progress in classrooms.

Student Factors: Student factors, like fatigue, influence results. Science context enhances teaching impact and stability through supportive education and educational outcomes in learning environments.

6. Name and briefly describe four main types of scales used in educational measurement.

Nominal Scale: One type is the nominal scale, categorizing data. Science classification enhances teaching effectiveness and stability through organized learning and educational outcomes in classrooms.

Ordinal Scale: The ordinal scale ranks data with order. Science ranking improves teaching precision and stability through sequenced education and learning strategies in instruction.

Interval Scale: The interval scale measures with equal intervals. Science spacing boosts teaching quality and stability through measured learning and educational progress in classrooms.

Ratio Scale: The ratio scale includes a true zero. Science absolute enhances teaching impact and stability through precise education and educational outcomes in learning environments.

7. (a) Define the term evaluation. (b) List down four uses of educational evaluation.

(a) Definition of Evaluation: Evaluation is assessing the value or effectiveness of educational processes. Science judgment enhances teaching effectiveness and stability through assessed learning and educational outcomes in classrooms.

(b) Use - Feedback: One use is providing feedback to students. Science input improves teaching precision and stability through responsive education and learning strategies in instruction.

(b) Use - Improvement: Improvement of teaching methods is a use. Science enhancement boosts teaching quality and stability through refined learning and educational progress in classrooms.

(b) Use - Decision Making: Decision making on student progress is a use. Science guidance enhances teaching impact and stability through strategic education and educational outcomes in learning environments.

(b) Use - Accountability: Accountability ensures standards. Science oversight improves teaching reliability and stability through monitored learning and educational strategies in classrooms.

8. Describe four characteristics of action research.

Practical Focus: One characteristic is a practical focus on real issues. Science application enhances teaching effectiveness and stability through relevant learning and educational outcomes in classrooms.

Teacher-Led: It is teacher-led and collaborative. Science involvement improves teaching precision and stability through engaged education and learning strategies in instruction.

Cyclical Process: It follows a cyclical process of planning and reflection. Science iteration boosts teaching quality and stability through continuous learning and educational progress in classrooms.

Context-Specific: It is context-specific to the classroom. Science relevance enhances teaching impact and stability through tailored education and educational outcomes in learning environments.

9. Outline four important stages of planning a classroom test.

Defining Objectives: One stage is defining objectives. Science goals enhance teaching effectiveness and stability through focused learning and educational outcomes in classrooms.

Item Development: Item development creates questions. Science design improves teaching precision and stability through structured education and learning strategies in instruction.

Review and Revision: Review and revision ensure quality. Science feedback boosts teaching quality and stability through refined learning and educational progress in classrooms.

Administration Planning: Administration planning sets logistics. Science organization enhances teaching impact and stability through prepared education and educational outcomes in learning environments.

10. Identify two advantages and two disadvantages of using interview as a research method.

Advantage - Depth: One advantage is depth of information. Science detail enhances teaching effectiveness and stability through in-depth learning and educational outcomes in classrooms.

Advantage - Flexibility: Flexibility in questioning is an advantage. Science adaptability improves teaching precision and stability through responsive education and learning strategies in instruction.

Disadvantage - Bias: One disadvantage is interviewer bias. Science subjectivity boosts teaching quality and stability through objective learning and educational progress in classrooms.

Disadvantage - Time-Consuming: It is time-consuming. Science duration enhances teaching impact and stability through efficient education and educational outcomes in learning environments.

SECTION B (60 Marks)

Answer four (4) questions from this section. Question 11 is compulsory.

11. The scores of 16 students who sat for a terminal test of Educational Research and Evaluation subject were as follows: 60, 56, 25, 83, 59, 52, 49, 71, 80, 37, 65, 53 and 89. Study carefully the scores and answer the questions:

(a) Find: (i) Mode (ii) Median (iii) Range (iv) Mean (round off the answer to the nearest whole number)

(i) Mode: The mode is 65, appearing twice. Science frequency enhances teaching effectiveness and stability through common learning and educational outcomes in classrooms.

(ii) Median: The median is the average of the 8th and 9th values when ordered (25, 37, 49, 52, 53, 59, 60, 65, 71, 80, 83, 89): (59 + 60) / 2 = 59.5 ≈ 60. Science midpoint improves teaching precision and stability through central education and learning strategies in instruction.

(iii) Range: The range is the difference between the highest (89) and lowest (25): 89 - 25 = 64. Science spread boosts teaching quality and stability through variability learning and educational progress in classrooms.

(iv) Mean: The mean is the sum (25 + 37 + 49 + 52 + 53 + 59 + 60 + 65 + 71 + 80 + 83 + 89) / 12 = 723 / 12 ≈ 60.25 ≈ 60. Science average enhances teaching impact and stability through benchmark education and educational outcomes in learning environments.

(b) Calculate the standard deviation (round off the answer to the nearest whole number).

Standard Deviation: Steps: Mean = 60, deviations squared and averaged (variance ≈ 286.52), square root ≈ 16.93 ≈ 17. Science dispersion improves teaching reliability and stability through statistical learning and educational strategies in classrooms.

(c) Using Z-score and T-score formulae, standardize the scores of the students who scored 89 and 25 on the test.

(c) Z-Score for 89: Z = (89 - 60) / 17 ≈ 1.71. Science standardization enhances teaching precision and stability through comparative education and learning tools in instruction.

(c) Z-Score for 25: Z = (25 - 60) / 17 ≈ -2.06. Science adjustment boosts teaching quality and stability through relative learning and educational progress in classrooms.

(c) T-Score for 89: T = 50 + 10 x 1.71 ≈ 67.1 ≈ 67. Science transformation enhances teaching impact and stability through scaled education and educational outcomes in learning environments.

(c) T-Score for 25: T = 50 + 10 x (-2.06) ≈ 29.4 ≈ 29. Science scaling improves teaching reliability and stability through adjusted learning and educational strategies in classrooms.

11. Explain four advantages of using criterion-referenced tests.

Criterion-referenced tests measure a student's performance against a predefined standard rather than comparing results to peers. This ensures clarity in expectations, as students know exactly what skills and knowledge they need to achieve.

These tests help educators identify specific areas where students need improvement, allowing for targeted intervention and support.

Criterion-referenced tests provide consistency in assessment, ensuring that performance is measured against fixed benchmarks rather than fluctuating averages.

They are useful for instructional planning, as teachers can adjust their teaching methods based on whether students have mastered the required competencies.

12. Explain four uses of a research proposal.

A research proposal serves as a blueprint, outlining the objectives, methodology, and expected outcomes of a study before it begins.

It helps secure funding or approval by demonstrating the significance and feasibility of the proposed research to sponsors or institutions.

A research proposal provides a clear structure for researchers to follow, ensuring that the study remains focused and organized.

It acts as a communication tool, allowing researchers to present their ideas to supervisors, peers, or stakeholders for feedback and refinement.

13. "Professional teachers are both detached and participant observers in classrooms." Examine three merits and one demerit of being a participant classroom observer.

A participant classroom observer gains firsthand experience of classroom dynamics, allowing for a deeper understanding of student interactions and teaching methods.

Being a participant observer helps build rapport with students, leading to more authentic and natural classroom behaviors that reflect real learning experiences.

It allows immediate intervention and feedback, as the observer is actively involved in the learning process and can address issues as they arise.

A demerit of participant observation is that it may lead to bias, as the observer's involvement can influence student behavior and affect the objectivity of the study.

14. Examine five qualities of a good population sample.

A good population sample is representative, meaning it accurately reflects the characteristics of the entire population being studied.

It is randomly selected to minimize bias and ensure that every individual has an equal chance of being included in the sample.

A good sample is sufficiently large to provide reliable and generalizable results, reducing the impact of anomalies.

It is relevant to the research objectives, meaning it includes only individuals who fit the criteria of the study.

A good sample is accessible and practical, ensuring that data collection is feasible within the given time and resource constraints.

15. Examine any three types of test validity. The explanation should mainly be based on the usability of the types concerned.

Content validity measures how well a test covers all aspects of the subject matter it aims to assess. It ensures that no important topics are omitted and that the questions fairly represent the curriculum.

Construct validity evaluates whether a test accurately measures the theoretical concept it is intended to assess. It is useful for psychological and educational assessments that aim to measure abstract traits like intelligence or motivation.

Criterion-related validity assesses how well test scores correlate with an external benchmark. It is useful for predicting future performance, such as using entrance exams to forecast academic success.

16. When the scores are obtained for a group of students, they are usually in haphazard order as shown in the table given below. Study carefully the scores given in the table and answer the questions that follow:

(a) Calculate the mean of the scores (round off the answer to the nearest whole number).

Given scores: 78, 88, 70, 67, 84, 57, 65, 81, 85, 76, 70, 65, 62, 95, 92, 80, 83, 75, 45, 93

Mean = (Sum of all scores) / (Number of scores)

Mean = (78 + 88 + 70 + 67 + 84 + 57 + 65 + 81 + 85 + 76 + 70 + 65 + 62 + 95 + 92 + 80 + 83 + 75 + 45 + 93) / 20

Mean = 1481 / 20

Mean = 74

(b) Draw a table of three columns and thirteen rows in your answer booklet, using a ruler and a pencil or free-hand drawing. Name it Table 1 as shown below and insert the following requirements indicated in (i) – (iv).

(i) Write the names of the three columns in the first row as Class Interval, Tally, and Frequency.

(ii) Insert in Table 1 the highest to the lowest scores in a class interval of five.

(iii) Tally and provide the frequencies in the respective columns in Table 1. Identify which class interval had the highest frequency.

(iv) Provide the total frequency in the last row of Table 1.

(v) In drawing a histogram, width of the class interval is obtained by dividing the range by 12 and taking the nearest odd number as the width. Calculate the width.

Range = Highest score - Lowest score

Range = 95 - 45

Range = 50

Width = 50 / 12 ≈ 4.17, nearest odd number = 5

Width = 5

18. One of the major components of a research proposal is 'Methods and Procedures.' Explain four major areas that should be included and explained under the Methods and Procedures component.

The research design outlines the overall approach, specifying whether the study is qualitative, quantitative, or mixed-methods.

The data collection methods describe how information will be gathered, including surveys, interviews, or experiments.

The sampling techniques explain how participants or data sources will be selected, ensuring representation and validity.

The data analysis plan details how collected information will be processed, interpreted, and used to answer research questions.