

**THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATION COUNCIL OF TANZANIA
DIPLOMA IN SECONDARY EDUCATION EXAMINATION**

762

**EDUCATIONAL RESEARCH, MEASUREMENT AND
EVALUATION**

Time: 3 Hours.

ANSWER

Year: 2007 a.m.

Instructions

1. This paper consists of sections A, B and C.
2. Answer **all** questions in sections A, **two (2)** questions from section B and **one (1)** question from section C.
3. Question **11** is **compulsory**.
4. Section A carries 36 marks, section B carries 40 marks and section C carries 24 marks
5. Cellular phones and unauthorized materials are **not allowed** in the examination room.
6. Write your **Examination Number** on every page of your answer booklet(s).

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1. Define the term research.

Research is a systematic and organized process aimed at discovering new knowledge, verifying existing knowledge, or solving a specific problem.

It involves collecting relevant data using well-planned methods to ensure the information gathered is accurate and reliable.

The process includes analyzing and interpreting data so that conclusions are based on evidence rather than assumptions.

It is carried out to answer a research question, test a hypothesis, or generate theories that can be applied in real situations.

2. Mention four characteristics of a good hypothesis in research.

A good hypothesis must be clear and specific, meaning it states exactly what is being studied without ambiguity. This ensures all readers understand the focus of the study.

It must be testable, allowing researchers to collect measurable data to prove or disprove it through scientific methods.

It should be based on existing knowledge or theory so that it has a logical foundation and is not based on guesses.

It must predict the relationship between variables, guiding the research process toward identifying how one factor affects another.

3. State four purposes of a research proposal.

A research proposal provides a clear plan of action, outlining how the study will be conducted from start to finish.

It helps convince supervisors, sponsors, or stakeholders that the research is important, relevant, and feasible.

It ensures that the researcher organizes time, resources, and methodology efficiently before the study begins.

It acts as a reference document during the research to monitor progress and ensure that the study remains focused on its objectives.

4. Give four functions of a research instrument try-out.

A try-out helps identify unclear or misleading questions in the research instrument so that they can be improved before the main study.

It is used to check whether the instrument measures exactly what it is intended to measure, thus ensuring validity.

It allows the researcher to estimate the time required for respondents to complete the instrument, helping with time management.

It is used to test the reliability of the instrument by checking if it produces consistent results under similar conditions.

5. List three advantages of using interviews for data collection.

Interviews allow the researcher to collect in-depth information since respondents can give detailed explanations and examples.

They make it possible to clarify unclear questions so that the answers given are accurate and reflect the respondent's true opinions.

They enable the collection of additional non-verbal cues, such as body language and tone, which provide extra meaning to the responses.

6. Give four reasons for conducting a literature review.

A literature review helps identify gaps in existing research so that the new study focuses on areas that have not been fully explored.

It provides background knowledge and theoretical context, enabling the researcher to connect their study to existing work.

It helps refine research questions and methodology by showing what approaches have been effective or ineffective in previous studies.

It allows the researcher to compare their eventual findings with previous studies, which helps in validating results.

7. Mention four qualities of a good test item.

A good test item should be clear and free from any form of ambiguity so that all students understand it the same way.

It must be directly related to the intended learning objectives to ensure that it measures what is supposed to be measured.

It should be of appropriate difficulty, challenging but not too hard for the intended group of learners.

It should allow for objective scoring, meaning the marking process does not depend on personal judgment but on clearly defined answers.

8. Briefly explain four levels of Bloom's taxonomy of educational objectives.

The knowledge level involves recalling facts, definitions, formulas, or concepts without necessarily understanding them deeply.

The comprehension level requires understanding the meaning of information and being able to interpret or summarize it.

The application level focuses on using learned knowledge to solve new problems or perform new tasks.

The analysis level involves breaking down complex information into parts to understand relationships and underlying patterns.

9. Give two advantages of using standard deviation as a measure of variability.

Standard deviation uses all data points in its calculation, which provides a more accurate and comprehensive measure of spread.

It is less affected by extreme scores than the range, giving a more reliable picture of how scores are distributed.

10. (a) What are instructional objectives?

Instructional objectives are precise statements describing what learners should be able to do after completing a lesson or course.

They act as a guide for both teaching and assessment by showing the intended learning outcomes.

(b) State four characteristics of instructional objectives.

They are specific, stating exactly what is expected from the learner in clear terms.

They are measurable, making it possible to determine whether the learner has achieved the objective.

They are achievable, meaning they can be accomplished within the available time and resources.

They are relevant, aligning with the curriculum goals and meeting the needs of the learners.

11. (a) Differentiate measures of central tendency from measures of dispersion.

Measures of central tendency are statistical tools used to describe the center or typical value in a set of data. They include the mean, median, and mode, and are used to summarize data with a single representative value.

Measures of dispersion describe how spread out or varied the data values are around the central value. They include the range, quartile deviation, variance, and standard deviation, and help in understanding the degree of variability in the dataset.

(b) The following are Mathematics scores for 10 students: 50, 80, 45, 70, 60, 85, 65, 55, 68, 50. Calculate:

(i) Range

Range = Highest score – Lowest score

$$\text{Range} = 85 - 45 = 40$$

(ii) Mean (nearest whole number)

Mean = Sum of all scores ÷ Number of scores

$$\text{Sum} = 50 + 80 + 45 + 70 + 60 + 85 + 65 + 55 + 68 + 50 = 628$$

$$\text{Mean} = 628 \div 10 = 62.8 \approx 63$$

(iii) Standard deviation (nearest whole number)

Step 1: Find deviations from the mean and square them:

$$(50-63)^2 = 169$$

$$(80-63)^2 = 289$$

$$(45-63)^2 = 324$$

$$(70-63)^2 = 49$$

$$(60-63)^2 = 9$$

$$(85-63)^2 = 484$$

$$(65-63)^2 = 4$$

$$(55-63)^2 = 64$$

$$(68-63)^2 = 25$$

$$(50-63)^2 = 169$$

$$\text{Step 2: Sum of squared deviations} = 169 + 289 + 324 + 49 + 9 + 484 + 4 + 64 + 25 + 169 = 1586$$

$$\text{Step 3: Variance} = 1586 \div 10 = 158.6$$

$$\text{Step 4: Standard deviation} = \sqrt{158.6} \approx 12.6 \approx 13$$

(c) Standardize the highest and lowest scores using a mean of 50 and a standard deviation of 10.

Formula: $Z = (X - \text{Mean}) \div \text{SD}$

Then Standard score = $(Z \times \text{New SD}) + \text{New Mean}$

Highest score: $X = 85$

$$Z = (85 - 63) \div 13 = 22 \div 13 \approx 1.69$$

$$\text{Standard score} = (1.69 \times 10) + 50 = 16.9 + 50 = 66.9 \approx 67$$

Lowest score: $X = 45$

$$Z = (45 - 63) \div 13 = -18 \div 13 \approx -1.38$$

$$\text{Standard score} = (-1.38 \times 10) + 50 = -13.8 + 50 = 36.2 \approx 36$$

12. Outline four steps in writing a research report.

The first step is preparing a title page and abstract, which clearly states the title of the research and provides a brief summary of its content.

The second step is writing the introduction, which explains the background, problem statement, objectives, and significance of the study.

The third step is presenting the methodology, which describes the research design, sample, instruments, and procedures used to collect and analyze data.

The fourth step is writing the results, discussion, and conclusion, which includes findings, interpretations, implications, and recommendations based on the study.

13. Discuss four limitations of true-false test items and give four suggestions for constructing good ones.

One limitation is that they have a high chance of guessing correctly, as there are only two possible answers.

Another limitation is that they cannot measure deep understanding or complex reasoning skills effectively.

They may encourage rote memorization rather than critical thinking, as students only need to recall isolated facts.

They can be misleading if the statement contains absolute terms like “always” or “never,” leading to confusion.

To construct good true-false items, ensure statements are clear and unambiguous so that all students interpret them the same way.

Avoid using absolute terms unless they are factually correct to reduce confusion and guessing.

Ensure that the statements are based on important learning objectives rather than trivial facts.

Balance the number of true and false statements to reduce patterns that encourage guessing.

14. (a) State four characteristics of standardized tests.

Standardized tests have uniform administration procedures, meaning they are given under the same conditions for all examinees.

They use consistent scoring methods, ensuring that results are comparable across different groups or times.

They are developed based on rigorous test construction methods, including item analysis and validation.

They have established norms, allowing for comparison of individual scores with a reference group.

(b) Give four criteria for standardized tests to function effectively.

They must be valid, accurately measuring what they are designed to measure.

They must be reliable, producing consistent results over repeated administrations.

They must be fair, free from bias that could disadvantage any group of test-takers.

They must be practical, considering cost, time, and ease of administration.

15. Discuss the first five elements of a research proposal.

The first element is the title, which should be concise, descriptive, and reflect the main focus of the study.

The second element is the introduction, which provides background information and explains why the study is necessary.

The third element is the statement of the problem, which clearly defines the issue the research seeks to address.

The fourth element is the objectives of the study, outlining the main aim and specific goals to be achieved.

The fifth element is the significance of the study, which explains how the research will benefit individuals, institutions, or the field of knowledge.

16. Explain four ways a literature review is useful in educational research.

It helps identify what has already been studied, preventing duplication of work and ensuring originality.

It provides a theoretical framework that guides the researcher in interpreting findings.

It helps refine the research problem by revealing gaps and suggesting areas that require further investigation.

It supports the selection of appropriate methodology by showing what has been effective in similar studies.