THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

STUDENTS' ITEMS RESPONSE ANALYSIS REPORT ON THE FORM TWO NATIONAL ASSESSMENT (FTNA) 2023

GEOGRAPHY

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FOREWORD

This report presents Students' Item Response Analysis (SIRA) on the Form Two Geography Subject National Assessment, which was conducted in November 2023. The report aims at providing feedback to all stakeholders in education on the factors that contributed to the students' performance in Geography subject.

The Form Two National Assessment (FTNA) is a formative evaluation that intends to monitor students' learning in order to provide feedback that teachers, students, and other stakeholders in education can use to improve teaching and learning.

The students who attained high scores identified the requirements of the questions, had adequate knowledge of the subject content, possessing skills in computing, and had good mastery of the English language and essay writing skills. However, the students with poor performance displayed contrary attributes. This report will help students identify their strengths and weaknesses so they can improve their learning before sitting for their Certificate of Secondary Education Examination (CSEE). It will also help teachers identify the challenging areas and take appropriate measures during teaching and learning.

The National Examinations Council of Tanzania (NECTA) expects that the feedback provided in this report will shed light on the challenges for which stakeholders in education should take proper measures to improve teaching and learning of the geography subject. Consequently, students will acquire knowledge, skills, and competences as indicated in the syllabus for better performance in future assessments and examinations. The Council appreciates the contribution of all those who participated in the preparation of this report.

Dr. Said Ally Mohamed
EXECUTIVE SECRETARY

1.0   INTRODUCTION

This report analyses the students' performance in the Geography subject (FTNA) conducted in November 2023. The examination assessed competences as per the Geography subject syllabus of 2005.

It consisted of ten (10) questions, which were divided into three sections: A, B and C. The students were required to answer all the questions. Section A consisted of two (2) objective questions. Section B had seven (7) short-answer questions. Section C had one (1) essay question.

In this report, the analysis of students' performance is divided into three categories: good, average, and weak, indicated by green, yellow, and red colours, respectively. That means, in each question, the performance is regarded as good if the scores range from 65 to 100 percent, average if the scores range from 30 to 64 per cent, and weak if the scores range from 0 to 29 percent.

It also includes the prerequisites for each question, the percentage of students that attempted each question, their scores, and the possible reasons for their performance. Extracts from the students' examination scripts, graphs indicating the distribution of the students' scores, and appendices are presented in this report for illustrations.

The results are presented in five grades: A, B, C, D and F. These grades are assigned to students based on the following intervals: 75–100 (excellent), 65–74 (very good), 45–64 (good), 30–44 (satisfactory), and 0–29 (fail), respectively. Those students who achieved grades ranging from A to D (30 and above) are considered to have achieved a pass.

In 2023, a total of 695,107 students sat for the FTNA in Geography. Out of which 373,387 (53.78%) students passed, 320,850 (46.22%) failed. The analysis indicated that the performance of the students in 2023 has decreased by 1.22 percent compared to the FTNA 2022, in which 55.00 percent of the students passed and 45.00 percent failed.

2.0 ANALYSIS OF STUDENTS' PERFORMANCE FOR EACH QUESTION

2.1 SECTION A: OBJECTIVE QUESTIONS

This section consisted of two questions with a total of 15 marks. Question 1 consisted of 10 multiple-choice items carrying a total of 10 marks, and question 2 consisted of 5 matching items that carried a total of 5 marks.

2.1.1 Question 1: Multiple Choice Items

This question aimed at testing the students' knowledge on *The Solar System, Major Features of the Earth's Surface, Water Management for Economic Development, Transport, Map Work, Tourism, Agriculture* and *Sustainable Use of Forest Resources*. A student was instructed to choose the correct answer out of the four given alternatives. Each item carried 01 mark.

A total of 695,107 (100%) students attempted this question. The analysis indicates that 163,799 (23.56%) students scored 0 to 2 marks, signifying weak performance; 465,193 (62.61%) students scored 3 to 6 marks, which is average performance; and 96,113 (13.83%) students scored 6 to 10 marks, which is good performance. In general, the performance on this question was good, as 76.40 percent of the students scored from 3 to 10 marks. Figure 1 illustrates the percentage of students' performance in this question.
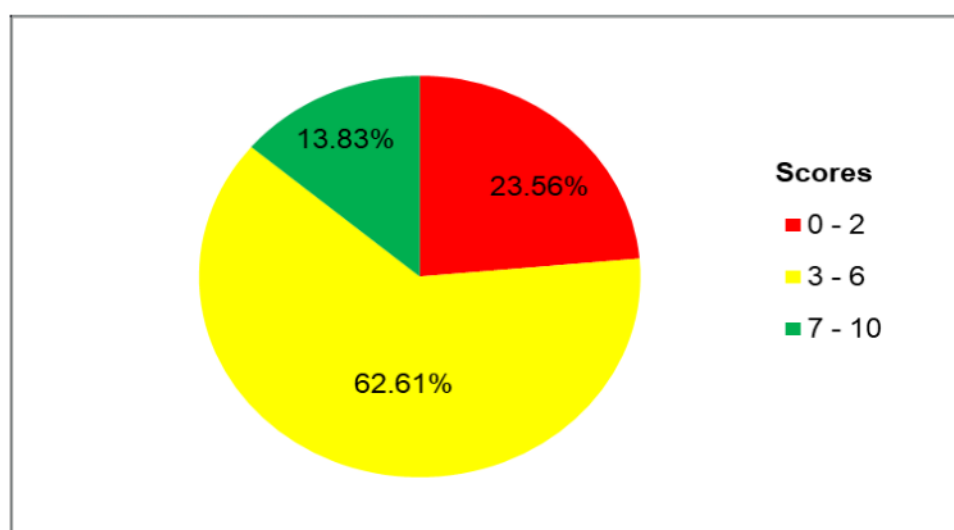

Figure 1: *Students' Performance in Question 2*

Generally, the performance for this question was good, as the statistics indicate that the majority (76.44%) of students scored between 3 and 10 marks. In addition, it suggests that the processes of teaching and learning were carried out appropriately on those topics. The following is the analysis of students' responses to each item.

(i) *What happens when the earth passes between the moon and the sun?*
    A Solar eclipse   *B Lunar eclipse*
    C Revolution   *D Rotation*

The correct response for this item is option B, *Lunar Eclipse.* Students who chose the correct response demonstrated an understanding of the effects of the revolution of the moon around the Earth. Additionally, students who chose option A, *solar eclipse,* were unaware of the fact that a solar eclipse takes place when the moon passes between the Earth and the Sun. Apart from that, those who opted for distractors C, *Revolution,* and D, *Rotation,* demonstrated a general understanding of the different types of Earth's movement, but they were unable to identify the effects of these movements.

(ii) *A form one geography teacher asked students to plan for a trip to the smallest continent. Which continent are they intending to visit?*
    A Europe   *B Australia*
    C North America   *D Antarctica*

The correct response for this item is B, *Australia.* The students who selected the correct response had good knowledge of the major features of the Earth's surface, especially the sizes of the continents, while those who opted for distractors A, *Europe*, C, *North America,* and D, *Antarctica,* had general knowledge about the continents but lacked the ability to visually compare the sizes of each specific continent.

(iii) *Suzan was told by her grandfather that they can turn their degraded land into a useful agricultural land. Identify the suitable techniques that Suzan's grandfather would use to improve the land.*
    A   Afforestation and draining
    B   Drainage and overgrazing
    C   Afforestation and overgrazing
      D   Overgrazing and planting cover crop

Option *A*, which stands for *afforestation and draining,* is the correct response for this item. The students who selected the correct response were familiar with the techniques used in land reclamation. In addition, the students who chose distractors *B drainage and overgrazing, C afforestation and overgrazing,* and *D overgrazing and planting cover crops* failed to differentiate the techniques that are used to conserve land from practices that degrade it. *Overgrazing* causes land degradation.

(iv) *Which type of transport is **not** affected by physical barriers?*
    A Land transport   *B Road transport*
    C Air transport   *D Pipeline transport*

Option *C, air transport,* is the correct response to this question. The students who selected it possessed adequate knowledge of the main types of transportation systems and their importance. On the other hand, those who chose distractors *A land transport, B road transport,* and *D pipeline transporta* had a general knowledge of the various modes of transport but failed to remember the physical obstacles, such as mountains, rivers, and lakes, and how they can or cannot hinder transit.

(v) *Baina's farm is located in the South West of Kwetu Secondary school. Identify the correct bearing of that farm from the school.*
    A   *22.5⁰*   *B*   *225⁰*
    C   *112.5⁰*   *D*   *180⁰*

The correct response for this item is option *B, 225^0*. The students who selected it demonstrated a sufficient level of comprehension of the procedures for determining the bearing and direction of various features. On the contrary, those who chose distractors A, *22.5^0*, C, *112.50,* and D, *1800,* had limited knowledge of the concepts since bearings *22.5^0* locate *North North East (NNE), 112.5^0* locate *East South East (ESE),* and *180^0* locate *South (S).*

(vi) *Form two students from Micheweni Secondary School visited different historical sites found in Bagamoyo. Identify the type of tourism they were involved in.*
    A Cultural tourism   *B International tourism*
    C Eco-tourism   *D Domestic tourism*

The correct response to this question is *D, domestic tourism*. The students who opted for it were aware of the types of tourism. Those who chose distractor *A, cultural tourism,* had a misconception in showing the interrelationship between historical sites and cultural tourism because *cultural tourism* is a cultural aspect while a historical site is a place that holds significant cultural, historical, or archaeological values. Additionally, the students who chose distractor *B, International tourism,* showed inadequate knowledge about the types of tourism since *international tourism* is the movement of people from their home countries to other countries for pleasure, business, education, etc. Moreover, they had limited knowledge about where the mentioned sites or destinations of tourism are located; thus, they failed to identify that both Micheweni Secondary School and Bagamoyo are found within one country. Furthermore, the students who chose distractor *C, eco-tourism,* had no knowledge of the types of tourism that involves the movement of people within the country, because *Eco-tourism* is the way of promoting tourism by protecting animals and plants so as to attract the tourists.

(vii)   *Joe had a chance to observe the mountains which have been formed by land uplifting in Asia. Which process caused the formation of those mountains?*
A   *Breaking of the earth's rocks*
B   *Wrinkling of the earth's crust*
C   *Pilling up and cooling of rocks*
D   *Faulting of the earth's crust*

The correct response for this item is option *D, Faulting of the earth's crust*. The students who selected the correct response demonstrated good knowledge on the major features of the continents and the processes for their formation. The students who opted for distractor A, *Breaking of the earth's rocks* lacked understanding of the process of mountain formation because breaking of the earth's rocks is the result of weathering process caused by various factors. In addition, the students who selected alternative

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B, *Wrinkling of the Earth's crust* were attracted to the name Asia, which is the region in which the Himalayan Mountains are located. These mountains are the consequence of the wrinkling of the upper regions of the Earth's crust as a result of compressional force. On the other hand, the students who chose distractor C, *Pilling up and cooling of rocks* related to the volcanic mountain developed due to volcanic eruption, when lava erupts, cause cooling and hardening on the vent forming mountains.

(viii) *Ole Saitoti move with his livestock from one area to another looking for pasture and water. In which category can Ole Saitoti be classified?*
A   Semi – nomad   B   Pastoralist
C   Cultivator   D   Nomad

The correct response for this item is D, *Nomad*. Students who selected the correct response demonstrated a sufficient level of knowledge of livestock keeping, particularly with regard to the various types of traditional livestock keepers. Those who opted for distractor (semi-nomad) were aware of the livestock keepers who move with livestock in search of pasture and water. However, they failed to identify one additional unique feature of this category of livestock keepers: they are also involved in crop cultivation. Additionally, those who chose option B, *pastoralist,* were aware of the various types of livestock husbandry, but they failed to recognize that the pastoralist category encompasses both nomads and semi-nomads with their livestock. Moreover, students who selected option C, *cultivator*, lacked knowledge of the different types of livestock keepers because cultivators grow crops only and are not involved in the rearing of animals.

(ix) *Water is very important for social and economic life of the societies living along Rufiji River. Identify the social economic uses of water in such area.*
A   Domestic and industrial
B   Industrial and irrigation
C   Washing and bathing
D   Irrigation and navigation

The correct response for this item is option A, *Domestic and Industrial.* The students who chose the correct response demonstrated an adequate level of knowledge of water management, particularly the significance of water for

social and economic life. Students who chose distraction C, *washing and bathing*, failed to recognize that these are examples of social uses of water. On the other hand, students who chose distractions D, *Irrigation and Navigation* failed to remember that *irrigation* is an example of an economic use of water, whereas *navigation* is an example of a social use of water.

(x) *Form one students at Mtakuja secondary school visited the area near Indian Ocean. Which type of forest they could have seen in the located area?*

    A   *Mangrove forest*   B   *Deciduous forest*
    C   *Tropical rain forest*   D   *Tropical monsoon forest*

The correct response to this question is option A: *mangrove forest.* The students who chose the correct response recognized the types of forests that cover most of the Indian Ocean coast. The students who opted for options *B deciduous forest, C tropical rainforest* and *D tropical monsoon forest* had general knowledge of the concept of forest resources, but they lacked sufficient knowledge regarding the types of forests and their distribution. Since *deciduous forests* are located between 30^0 and 50^0 north and south of the Equator, *Tropical rainforests* are found in the equatorial region, while *tropical monsoon forests* are found in southern Asia, where strong seasonal or monsoon winds blow.

2.1.2 Question 2: Matching Items: Sustainable Use of Power and Energy Resources

The question is composed of five premises from the topic of *Sustainable Use of Power and Energy Resources* under the subtopic of *types of energy and power sources*. The question required students to match the descriptions of power generation in **List A** with their correct types of power in **List B** by writing a letter of the correct response below the item number in the table provided. Each premise carried one mark, for a total of five (05) marks. The question was as follows:

*Match the descriptions of power production in **List A** with their corresponding types of power in **List B** by writing the letter of correct response below the item number in the table provided.*

List A		List B	
(i)	*The power generated from waterfalls.*	A	*Solar energy*
(ii)	*The power tapped from sea waves.*	B	*Nuclear power*
(iii)	*The energy extracted from hot spring.*	C	*Geothermal power*
(iv)	*The type of power extracted from the uranium.*	D	*Hydroelectric power*
		E	*Wind energy*
(v)	*The type of power extracted from the suns heat.*	F	*Wave energy*
		G	*Tide energy*

The analysis of the students' performance indicates that 695,107 (100%) students responded to this question. Further analysis indicates that, out of those students, 141,669 (20.38%) scored between 0 and 1 mark, which is a weak performance. Moreover, analysis shows that 391,795 (41.97%) students scored 2 to 3 marks, which is average performance and 261,712 (37.65%) scored 4 to 5 marks, which is good performance. The general performance in this question was good, as 79.62 per cent of the students scored 2 to 5 marks. A representation of the students' performance in question 2 is shown in Figure 2.
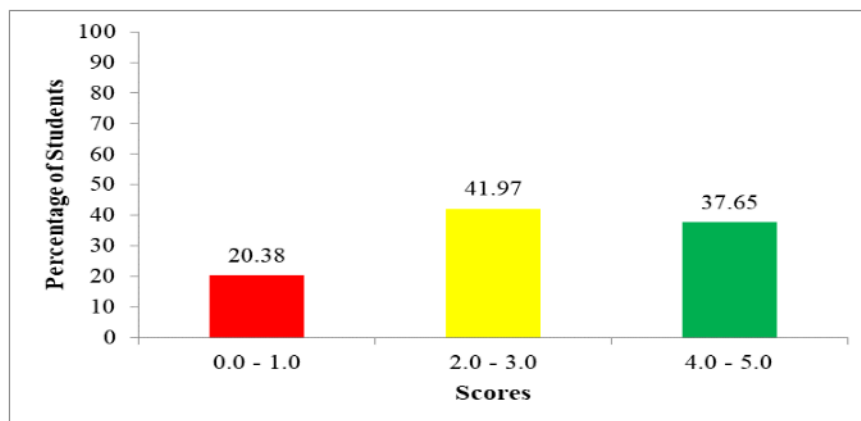

Figure 2: *Students' Performance in Question 2*

The majority of students showed sufficient knowledge about the major sources of power, as they matched different types of energy and power sources correctly. That is (i) *D, hydroelectric power*; (ii) *F, wave energy*; (iii) *C, geothermal power*; (iv) *B, nuclear power;* and (v) *A, solar energy*.

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On the other hand, the 141,669 (20.38%) students with weak performance had inadequate knowledge of the major types of energy and power sources. For instance, those who scored a 1 were able to match only one source of power correctly out of five. Such types of power include: (i) *solar energy, which is the type of power extracted from the sun's heat;* and (ii) *wave energy, which is the power trapped by sea waves.*

Furthermore, there were some students who were unable to match *wave energy* with *tidal energy*. The students failed to differentiate between these two sources of power and energy because they are similar but differ in the place of production. *Wave energy* is able to capture its power from sea waves that are caused by wind action on sea water, whereas *tide energy* is able to capture its power from sea water as a result of tides.

2.2   SECTION B: SHORT ANSWER QUESTIONS

This section had seven compulsory short-answer questions that carried 10 marks each. The analysis of each question is as follows:

2.2.1   Question 3: Weather

This question tested the students understanding of the concept of weather. It had three parts (a), (b), and (c), in which the students were required to read the statement that was provided and then respond to the questions that were posed afterward. The statement was, *"King'oto village is surrounded by mountains. Most of its rainfall originates from those mountains."*

(a)   *Name the possible type of rainfall in King'oto village.*
(b)   *Describe the type of rainfall named in (a).*
(c)   *Illustrate the type of rainfall in King'oto village by using a well labelled diagram.*

A total of 695,107 (100%) students attempted this question. The analysis revealed that 518,768 (74.63%) students performed poorly by scoring 0 to 2 marks, 143,926 (20.71%) had average performance as they scored 2.5 to 06 marks, whereas 32,413 (4.66%) had good performance as they scored 6.5 to 10 marks. The general performance of the students in this question was

weak because only 25.37 per cent of the students scored 2 to 5 marks. Figure 2 illustrates the students' performance in this question.
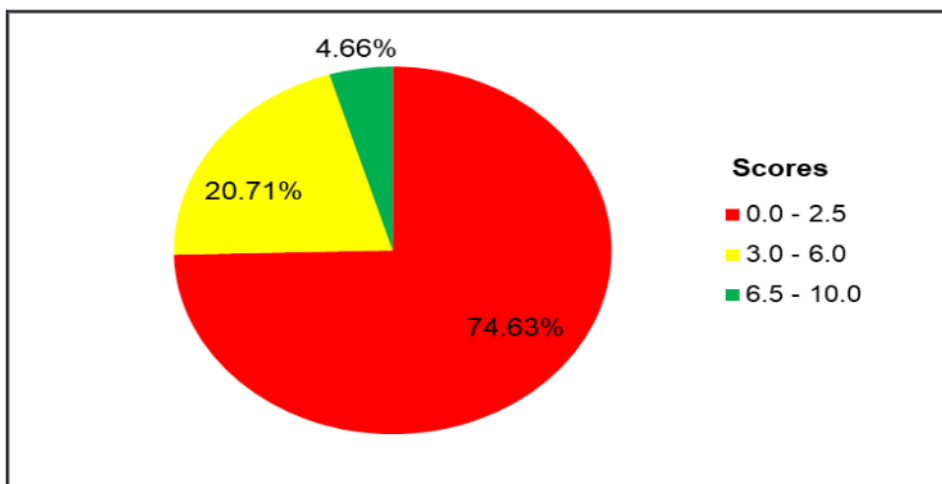

Figure 3: *Students' Performance in Question 3*

A total of 518,768 (74.63%) students with weak performance had limited knowledge about weather, especially types of rainfall and how they are formed. In this category, students provided incorrect responses that did not address the demand of the question. Most of the students explained the unintended types of rainfall, which implied that the students were not conversant with how the types of rainfall occur. For example, one student wrote *convectional rainfall* in part (a) instead of *relief rainfall*; in part (b), s/he described *convectional rainfall,* while in part (c), He or she drew a correct diagram of relief rainfall but failed to clearly show the windward and leeward sides. This student failed to realize that *convectional rainfall* is the type of rainfall formed as a result of differential heating of the earth's surface that causes warm, moist air currents to rise. As the air current rises vertically to higher altitudes, it cools and condenses to form clouds, from which rain falls. Extract 3.1 illustrates such weak responses.

3. King'oto village is surrounded by mountains. Most of its rainfall originates from those mountains.
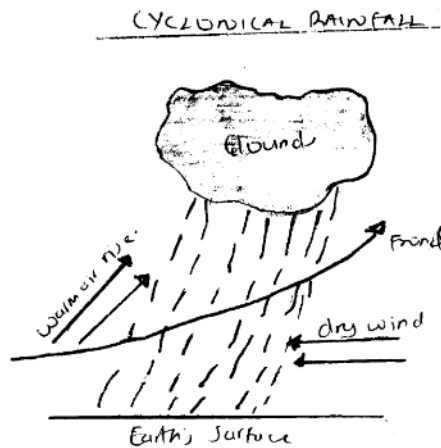
(a) Name the possible type of rainfall in King'oto village.

...... Cyclonical rain full ......

(b) Describe the type of rainfall named in (a).

...... Cyclonical rain full is the type of rain full which formed when two air masses of different temperature met. ......

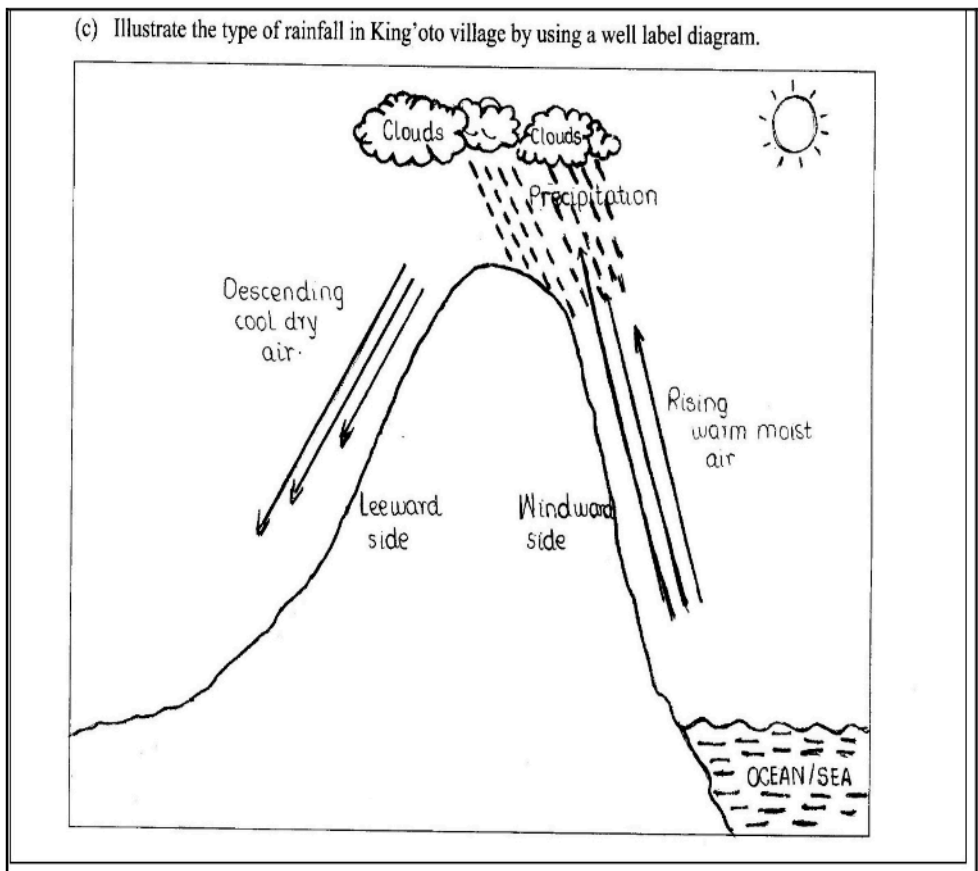(c) Illustrate the type of rainfall in King'oto village by using a well label diagram.

Extract 3.1: A sample of incorrect illustration for question 3

In extract 3.1, the student named the type of rainfall as cyclonical rainfall instead of relief or orographic rainfall in part (a). In part (b), the student explained how cyclonic rainfall is formed instead of explaining the formation of relief rainfall. In part (c), the student drew a diagram of cyclonic rainfall instead of relief or orographic rainfall.

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A total of 176,339 (25.37%) students with good performance demonstrated sufficient knowledge on the topic of weather, particularly with regard to the formation of rainfall and its various types. In part (a), they correctly named the type of rainfall in King'oto village as *relief or orographic rainfall*. In Part (b), they correctly described the type of rainfall that was mentioned in Part (a), as *the type of rainfall occurs when moist wind from the ocean is forced to rise over the high mountain. When it reaches high altitudes, the moisture in the wind condenses to form clouds and, later, droplets that eventually fall as rainfall. The windward side of the mountain receives more rainfall than the leeward side.*

Similarly, in part (c), they prepared a correctly labelled diagram of the relief and orographic rainfall. The accuracy and clarity of their responses were the factors that contributed to the variation in their marks. Extract 3.2 is a sample of correct responses from one of the students who performed well in this question.

3. King'oto village is surrounded by mountains. Most of its rainfall originates from those mountains.

(a) Name the possible type of rainfall in King'oto village.

............Relief or orographic rainfall............

(b) Describe the type of rainfall named in (a).

...The relief type of rainfall is formed due to ascending or rising of warm air up a mountain and thus reaching a high altitude at which the warm moist air condenses to form clouds. The clouds then result to rainfall that occurs on only one side of the mountain called the windward side leaving the leeward side dry

(c) Illustrate the type of rainfall in King'oto village by using a well label diagram.

Extract 3.2: A sample of correct responses for question 3

On the contrary, a total of 143,926 (20.71%) students with average scores possessed a moderate level of knowledge regarding weather, particularly the formation of rainfall and its types. In part (a), some students correctly named the type of rainfall. In part (b), some of them described the type of rainfall correctly, while in part (c), some students drew a diagram of the relief or orographic rainfall but failed to label it correctly.

2.2.2 Question 4: The Solar System

This question was derived from the topic of the solar system. It had two parts (a) and (b), in which the students were required to read the given statement and then respond to the questions that followed. The statement was: *"Mwamvua is living in Musoma (33^0 E) and had to make a call to John at 5:00pm who is living in Mexico City (80^0 W).*
(a) Calculate the local mean time for John's location.
(b) What would be the local mean time at John's location if Mwamvua was living in Washington (96^0 W)?"

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A total of 695,107 (100%) students attempted this question. The analysis of the data revealed that 638,457 (91.85%) students scored 0 to 2.5 marks, which is a weak performance. A total of 44,506 (6.40%) students scored 3 to 6 marks, which is average performance, whereas 12,142 (1.75%) scored 6.5 to 10 marks, which is good performance. The general performance of students in this question was weak since only 8.1 per cent of the students scored from 3 to 10 marks. Figure 4 summarizes the students' performance for question 4.
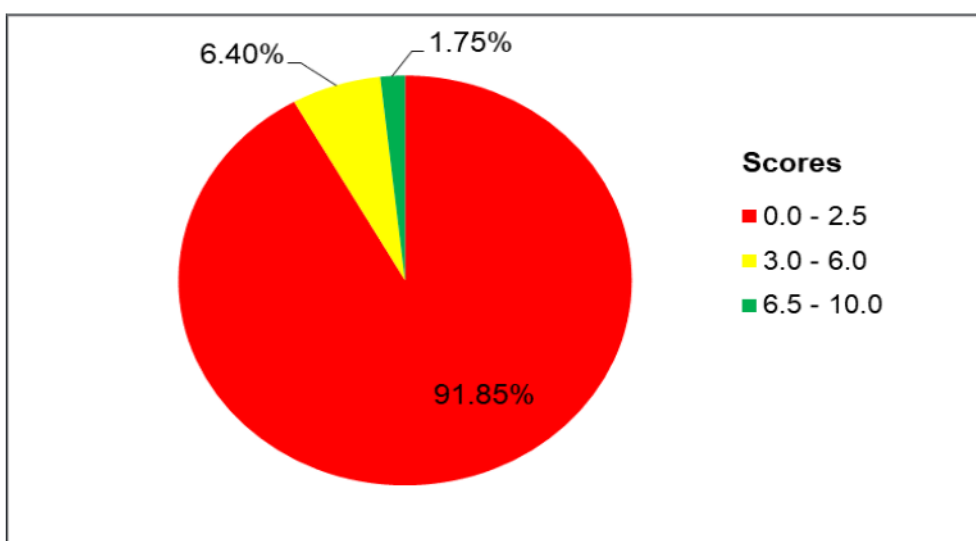

Figure 4: *Students' performance in Question 4*

The majority of students (91.85%) who had weak performance lacked knowledge on the application of parallels and meridians in calculating local time due to their lack of mathematical skills, which caused them to get incorrect responses. In this category, some students calculated the difference in degrees in both parts (a) and (b) but could not follow other procedures. Likewise, some of them in part (a) subtracted degrees instead of adding them, whereas others added instead of subtracting. Therefore, incorrect calculations caused them to get the wrong responses. For instance, in part (a), one student subtracted the degrees rather than adding them, i.e., 80^0 *minus* $33^0 = 47^0$, thus ending up with an incorrect response. Whereas in part (b), the degrees were added instead of subtracted, as $96^0 + 80^0 = 16^0$. Although the stages were followed correctly, the ultimate result was an incorrect response. This was evidence that the students were unclear about when to determine the difference in degrees by adding and in what circumstances the differences in degrees are determined by subtracting.

The analysis indicates that 44,506 (6.40%) students with average performance had moderate knowledge of the application of parallels and meridians in calculating the local time. Some students in part (a) provided incorrect responses, while others in part (b) provided correct responses. In contrast, others wrote correct responses in part (a), whereas in part (b), they gave incorrect responses. Additionally, some students calculated the difference in degrees and time between the given degrees in part (a), but failed to subtract that time from the given time to get the correct time, while in part (b), they calculated the difference in degrees and time between the given degrees but failed to add the time they were given to get the correct time. For example, one student in part (a) followed only two steps. The responses were as follows:

(i) *The difference in degrees between the two places*
   $80^0\ W + 33^0\ E = 113^0$
(ii) *The difference in time between the two places*
   If $\quad 15^0\ = 1hr$
   Then $\quad 113^0\ =?$
   So, $\underline{113^0\ x\ 1\ hr. = 7:32\ hours.}$
   $\qquad 15^0$

In part (b) s/he calculated the difference of degrees and time between the given places but failed to add the calculated time difference to the given time to get the correct time of the asked place. Also, in this part, only two procedures were followed. The responses were as follows;
(i) *The difference of degrees between the two places*
   $96^0\ W - 80^0\ W = 16^0.$

(ii) *The difference in time between the two places,*
   If $\quad 1^0\ = 4\ minutes$
   Then $16^0\ = ?$
   So, $\underline{16^0\ x\ 4'\ =1.04\ hr}$

This student revealed general knowledge of finding the differences between degrees and time but lacked knowledge of adding and subtracting time since he could not identify the west and east sides. Thus, I failed to get the correct response.

The item response analysis revealed that 12,122 (1.75%) students with good performance had adequate knowledge on the application of parallels and meridians in calculating the local time. They calculated the difference in degrees and time between the given areas and subtracted that time from the time they were given to get the correct time in part (a). The correct procedures followed were as follows:

(i) *The difference in degrees between the two places*
     $80^0 \ W + 33^0 \ E = 113^0$
(ii) *The difference in time between the two places*
     If $15^0 \ = 1hr$
     Then $113^0 \ =?$
     So, $\underline{113^0 \ x \ 1 \ hr. = 7:32 \ hours.}$
              15^0
(iii) *Subtract the time calculated from the time provided are 5:00pm –*
     7:32 = 9:28 a.m.
     Therefore, the local mean time is 9:28 a.m.

Moreover, in part (b) they calculated the difference in degrees and time between the given places and added that time difference to the given time to get the correct time. The responses were as follows;
(i) *The difference of degrees between the two places*
     $96^0 \ W - 80^0 \ W = 16^0.$
(ii) *The difference in time between the two places,*
     If $1^0 \ = 4 \ minutes$
     Then, $16^0 \ = \ ?$
     So, $\underline{16^0 \ x \ 4' \ = 1.04 \ hr}$
                1^0
(iii) *Adding the time difference.*
         5:00 p.m + 1:04 = 6:04 p.m.

Yet, their scores varied depending on the strengths of their responses. Extract 4.1 demonstrates a sample of correct response for this question.

4. Mwamvua is living in Musoma (33°E) and had to make a call to John at 5:00 pm who is living in Mexico City (80°W).

(a) Calculate the local mean time for John's location.

1. Variation in longitude	452min = 7:32 hrs	
33° + 80°	7hrs 32min	It is 9:28AM
113°	Since John is West	at John's location
2. Convert degrees to hours	5.00pm - 7:32hrs	
1° = 4'	1700hrs -0732 hrs	
113° = ?	= 0928hrs → 9:28am	

(b) What will be the local mean time at John's location if Mwamvua was living in Washington (96°W)?

1. Variation in longitude	64min → 1hr 4min	
96° - 80°	96°W → 80°W	
16°	5.00pm 1hr4min ??	It would be
2. Convert degrees into	1 → 5.00p + 1hrs 4min	6:04PM
Minute / hrs	Since 96° W is the furthest	
1° = 4'	than 80°W	
16° = ?	6:04PM	

Extract 4.1: A sample of correct responses for question 4

2.2.3 Question 5: Sustainable Mining

This question tested the students understanding of the concept of mining. It had three parts (a), (b), and (c), in which the students were required to read the given statement and then respond to the questions that followed. The statement was: *You have been invited in Zanzibar to assist in the exploration of a liquid energy mineral used for running automobiles, machines and engines.*
(a) *Identify that mineral.*
(b) *Outline two possible environmental problems caused by the extraction of minerals named in (a).*
(c) *Suggest three ways to reduce the environmental problems caused by the extraction of minerals named in (a).*

A total of 695,105 (100%) students attempted this question. The analysis of the data revealed that 475,051 (68.34%) students had weak performance as they scored 0 to 2.5 marks, 168,851 (24.29%) students had average performance as they scored 3 to 6 marks, whereas 51,203 (7.37%) had good performance as they scored 6.5 to 10 marks. The general performance of students in this question was average because 31.70 per cent of the students scored 3 to 10 marks. Figure 5 summarizes the students' performance in this question.
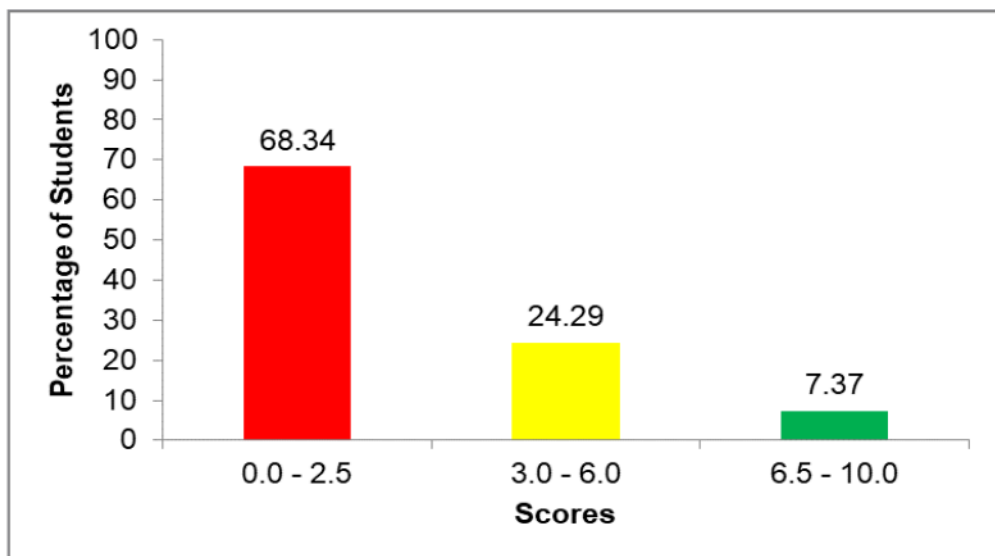

Figure 5: *Students' Performance in Question 5*

Further analysis shows that, 51,203 (7.37%) students scored higher marks because they had sufficient knowledge about the topic of sustainable mining, particularly on types of mining industries and their effects on the environment. In part (a), they identified the mineral as *petroleum.* Similarly, in part (b), they outlined the environmental problems caused by the extraction of petroleum, which were: *loss of biodiversity, loss of soil productivity, air, water, land, noise pollution, destruction of marine and wildlife habitats, land degradation,* and *deforestation.*

Conversely, in part (c), they offered solutions to the environmental issues that were brought about by the extraction of petroleum, which included: *land rehabilitation, proper use and storage of chemicals, proper waste management, the provision of environmental education, afforestation and reforestation, the proper implementation of government policy on mining*

regulations, and the adoption of friendly environmental technologies. However, the variation of marks was influenced by the strengths of their responses. Extract 5.1 represents a sample of correct responses to question 5.

5. You have been invited in Zanzibar to assist in the exploration of a liquid energy mineral used for running automobiles, machines and engines:

(a) Identify that mineral.

Petroleum.

(b) Outline two possible environmental problems caused by the extraction of the mineral named in (a).

(i) It can lead to soil erosion due to deforestation.

(ii) It can lead to desertification due to deforestation.

(c) Suggest three ways to reduce the environmental problems caused by the extraction of the minerals named in (a).

(i) Practising afforestation and reafforestation.

(ii) Covering the pits after mining the mineral.

(iii) Use of modern mining methods like drift method.

Extract 5.1: A sample of correct responses for question 5

Likewise, 168,851 (24.29%) students with average scores revealed that they had inadequate knowledge about the topic of *sustainable mining,* particularly petroleum and the impact of its extraction on the environment. Some students in part (a) identified the mineral correctly; in part (b), they outlined two possible environmental problems caused by the extraction of minerals named in (a), while in part (c), they suggested only one way to reduce the environmental problems caused by the extraction of that mineral. Some students could not identify the mineral in part (a), while others mixed correct with incorrect responses in parts (b) and (c). For instance, one student in part (a) identified the mineral as *coal* instead of *petroleum.* This student failed to realize that *coal* is a solid black or brownish rock made of organic substances that have been deposited for a long period and is used to heat furnaces, for domestic heating, and for the generation of thermal electricity. In part (b), the student mixed up correct and incorrect responses. An example of an incorrect response was *reforestation* instead of *deforestation.*

The student failed to recall that *reforestation* is the process of replanting trees in depleted areas. Thus, it is the way to reduce the environmental problems caused by the extraction of minerals.

Moreover, in part (c), the student mixed up correct and incorrect responses. An example of incorrect responses were *untreated waste* and *population pressure*. The student failed to remember that *untreated waste* and *population pressure* are the causes of environmental degradation. This showed that the student had general knowledge of environmental issues but could not identify the specific causes of environmental problems or ways to reduce them.

On the other hand, 475,051 (68.34%) students with weak performance had little knowledge about the topic of *sustainable mining*, particularly types of mining industries and their effects on the environment. In this category, some students in part (a) provided incorrect responses, while in parts (b) and (c), they mixed up correct and incorrect responses. Moreover, others in part (a) provided correct responses, whereas others in parts (b) and (c) gave few points with insufficient explanations. Moreover, some students provided incorrect responses in all parts. As an illustration, one student in part (b) mentioned correct and incorrect responses; an example of an incorrect response was *overgrazing.* The student failed to recall that *overgrazing* is the process of keeping a large number of animals in one area. So, the student could not recognize that this is one of the causes of environmental problems. This student lacked knowledge on ways to overcome environmental problems. Extract 5.2 represents a sample of incorrect responses to question 5.

Extract 5.2: A sample of incorrect responses for question 5

In extract 5.2, the student named coal instead of petroleum in part (a). The student was not aware that coal is a solid mineral, while the question demanded a liquid energy mineral. In part (b), the student explained social problems instead of environmental problems caused by the extraction of petroleum, which included *loss of biodiversity, loss of soil productivity, air, water, land, noise pollution, destruction of marine and wildlife habitats, land degradation,* and *deforestation.* In part (c), the students outlined ways to reduce social problems instead of ways to reduce environmental problems, such as *land rehabilitation, proper use and storage of chemicals, proper waste management, the provision of environmental education, afforestation and reforestation, the proper implementation of government policy on mining regulations, and the adoption of friendly environmental technologies.*

2.2.4 Question 6: Manufacturing Industry

The question consisted of parts (a), (b) and (c) whereby the students were required to read the statement provided and then respond the questions that followed. The statement given was, *Form two students of Kioja Secondary School visited an industry which deals with spinning and weaving of cotton and wool.*

(a) Identify the type of industry visited by the students.

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(b)   Describe three possible pollutants produced by the industry named in (a).

(c)   Examine three factors for the location of the industry named in (a)

This question was attempted by 695,104 (100%) students, of whom 444,112 (63.89%) had weak performance as they scored 0 to 2.5 marks. 229,022 (32.95%) students had average performance as they scored 3 to 6 marks, while 21,970 (3.16%) students had good performance as they scored 6.5 to 10 marks. The performance of students in this question was generally average, as 36.11 per cent of the students scored 3 to 10 marks. Figure 6 summarizes the students' performance for this question.
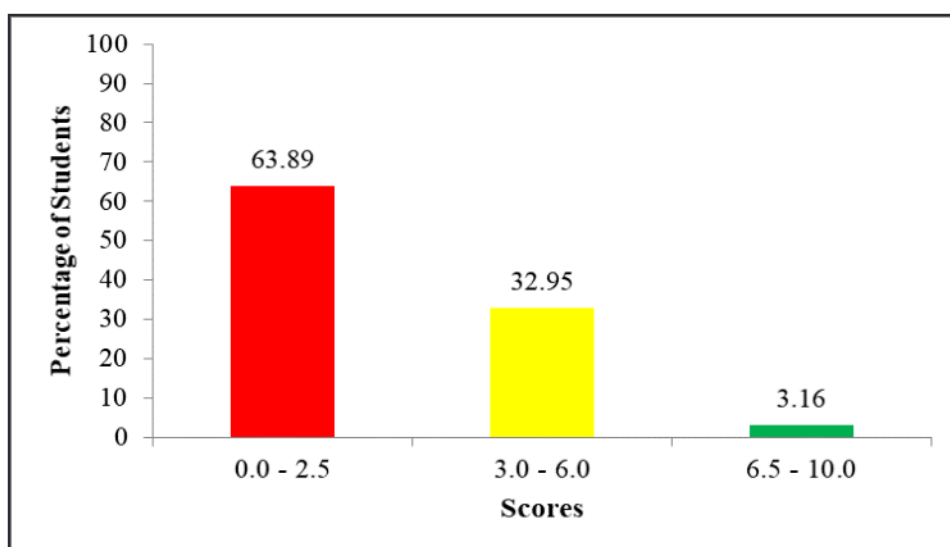

Figure 6: *Students' Performance in Question 6*

The analysis showed that 21,970 (3.16%) students who scored high marks revealed sufficient knowledge on the topic of the manufacturing industry, particularly on types of industrial pollutants and their locations, which enabled them to respond correctly in all parts. For example, in part (a), they identified the type of industry visited by the students as *textile industry or textile processing industry*. Moreover, in part (b), they described three possible types of pollutants produced by the industry, which were: *noise pollutants*, *water pollutants like oil and dirt*, *land pollutants* like solid waste, plastic bottles, and papers, and *air pollutants*.

Likewise, in part (c), they examined three factors for the location of the industry, which were: *availability of raw materials, reliable power supply, availability of a good transportation and communication network, reliable market, availability of capital, government policy, availability of labor, and availability of enough water supply*. The accuracy and clarity of their responses were the factors that contributed to the variation in their marks. Extract 6.1 is a sample of the correct responses to question 6.

6.   Form Two students of Kioja Secondary School visited an industry which deals with spinning and weaving of cotton and wool.
     (a)   Identify the type of industry visited by the students.
           Textile industry.
     (b)   Describe three possible pollutants produced by the industry named in (a).
           (i)   Liquid pollutants due to the disposal of liquid chemicals and dirty water
           (ii) Gaseous pollutants, due to the production of harmful gases and smoke
           (iii) Particulate pollutants, since the cotton and wool remains are taken as waste

     (c)   Examine three factors for the location of the industry named in (a).
           (i)   Availability of the raw material since it ensures running of industry.
           (ii) Availability of energy, electricity helps to promote continuous production.
           (iii) Availability of Labour, This includes drivers, manager and chemists.

Extract 6.1: A sample of correct responses for question 6

Likewise, 229,022 (32.95%) students who scored average had moderate knowledge about the topic of *manufacturing industry,* especially on types, pollutants (pollution), and factors for locating manufacturing industries, which led them to respond incorrectly in some parts. In part (a), some students provided incorrect responses. In part (b), they mixed up correct and incorrect answers, while in part (c), they only wrote two factors for the location of the industry.

For example, one student identified the type of industry as *the fabrication industry* instead of the textile *industry or textile processing industry* in part (a). The student failed to recall that *the fabrication industry* is the industry that uses raw materials from the processing industry to make new products. In part (b), some students mixed up correct pollutants with incorrect ones; an example of an incorrect response was *land degradation.* The student failed to recognize that *land degradation* is the deterioration or

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loss of productivity of the soil by erosive processes or other factors. Part (c), on the other hand, contained a mixture of correct and incorrect responses.

Contrarily, 444,112 (63.89%) students had weak performance due to having little knowledge of the concept of the manufacturing industry, generally on types, pollutants, and its location. Some students provided the correct response in part (a) only, while in parts (b) and (c), they gave incorrect responses. Some of them gave the correct response in part (a), while in parts (b) and (c), they provided only one point for each part.

For example, one student in part (a) identified the correct type of industry, and in part (b) mentioned *oil pollutants* instead of *noise, water, land,* and *air pollutants*. This student failed to recognize that *oil pollutants* are examples of *liquid pollutants*. So, it revealed that the student had general knowledge about pollutants but could not identify the categories. Apart from that, some students in part (c) stated the essentials of the map, which were *scale, key,* and *title*. Those students failed to recall that these are the components of the map. Probably these students were attracted by the word *location* used in the question, so they related to the map. Extract 6.2 represents a sample of such weak responses to question 6.

6. Form Two students of Kioja Secondary School visited an industry which deals with spinning and weaving of cotton and wool.
   (a) Identify the type of industry visited by the students.
   ...Manufacturing....Industry and Chemical....Industry.
   (b) Describe three possible pollutants produced by the industry named in (a).
   (i) ...Noise....Pollution
   (ii) ...Air...Pollution
   (iii) ...Water....Pollution
   (c) Examine three factors for the location of the industry named in (a).
   (i) ...Title
   (ii) ...Scale
   (iii) ...Key.

Extract 6.2: A sample of incorrect responses for question 6

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In extract 6.2, the student used the general terms manufacturing industry and chemical industry instead of textile industry in part (a). In addition, the student wrote categories of pollution, which are noise pollution, air pollution, and water pollution, instead of pollutants produced by the textile industry, which include *water pollutants like oil and dirt, land pollutants like solid waste, plastic bottles, and paper* in part (b). In part (c), the candidate wrote three essentials of the map—title, scale, and key—instead of factors to be considered for locating textile industries, which include *availability of raw materials, reliable power supply, availability of good transportation and communication networks, reliable markets, availability of capital, government policy, availability of labor, and availability of enough water supply.*

2.2.5 Question 7: Agriculture

This question tested the students understanding of the concept of agriculture. It had two parts (a) and (b), in which the students were required to read the given statement and then respond to the questions that followed. The statement was as follows:

You were given a task to write a report on an economic activity of rearing livestock and poultry for food and commercial purposes.

(a)   *Briefly explain four challenges facing that economic activity in Tanzania.*

(b)   *Describe four similarities in conducting that activity in Tanzania and Australia.*

The question was attempted by the 695,105 (100%) students, of whom 414,806 (59.68%) scored 0 to 2.5 marks, 234,333 (33.71%) scored 3 to 6 and 45,966 (6.61%) scored 6.5 to 10 marks. The performance of students in this question was generally average, as 40.32 per cent scored from 3 to 10 marks. Figure 7 illustrates the performance of students in this question.
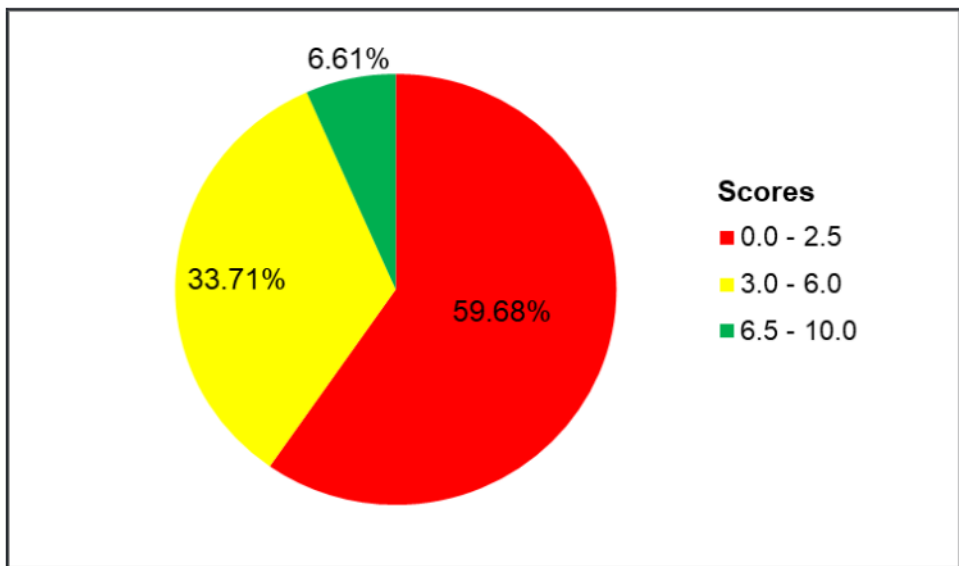
Figure 7: *Students Performance in question 7*

Further data analysis indicated that 45,966 (6.61%) students who scored high marks demonstrated sufficient knowledge about the topic of agriculture, particularly with regard to livestock keeping. Because of their strong comprehension, they executed admirably in both parts. For example, in part (a), they explained four challenges facing the mentioned economic activity in Tanzania, which include a *low level of technology, pests and diseases, a lack of reliable markets, and low capital*. Also, in part (b), they described four similarities in conducting that activity in Tanzania and Australia: both countries *keep similar types of livestock; both have set aside areas for ranches; both practice dairy farming; both keep livestock for subsistence and commercial purposes; and the development of the sector is very important for both countries.* The variation of marks among students was influenced by the strengths of their points and explanations. Extract 7.1 represents a sample of the correct responses to this question.

7. You were given a task to write a report on an economic activity of rearing livestock and poultry for food and commercial purposes;

(a) Briefly explain four challenges facing that economic activity in Tanzania.

(i) Harsh climatic conditions such as drought ....

(ii) Presence of pests and diseases such as swine flue ....

(iii) Poor storage facilities to store products such as meat, milk ....

(iv) Poor transport facilities for transporting livestock and poultry products to the market.

(b) Describe four similarities in conducting that activity in Tanzania and Australia.

(i) Both in Australia and Tanzania the same animals are reared such as goats, cows, sheep ....

(ii) Both in Australia and Tanzania rear animals for food and commercial purposes ....

(iii) Both in Australia and Tanzania livestock keeping is done in small scale and large scale.

(iv) Both Australia and Tanzania rear livestock and poultry which produce the same products such as eggs, meat, wool, milk

Extract 7.1: A sample of correct responses for question 7

Further analysis shows that 234,333 (33.71%) students who scored average marks had moderate knowledge about the topic of *agriculture,* especially livestock keeping. In parts (a) and (b), some students gave a few points without explanations. Some of them mentioned all the points in both parts but could not explain them. Additionally, some students provided incorrect responses in either part (a) or (b) and correct answers in one of the parts interchangeably. For example, one student in part (a) provided correct responses while in part (b) wrote similarities between livestock keeping in Tanzania and Australia, which were the *availability of capital, proper storage facilities, good infrastructure,* and *government support.* The student failed to remember that these are the solutions to problems facing livestock keeping. Therefore, it showed that the student had general knowledge of livestock keeping but could not identify specific similarities between livestock keeping in Tanzania and Australia.

On the other hand, 414,806 (59.68%) students with weak performance revealed insufficient knowledge about the topic of agriculture, especially livestock keeping. In part (a), some students mixed up correct and incorrect responses; likewise, in part (b), Some of them wrote only one point for each part, while others provided correct responses for only one part while the other part had incorrect responses. Others wrote correct and incorrect responses in both parts. Examples of incorrect responses in part (a) were *improving soil fertility* and *proper fencing.* The student could not realize that these are ways of improving large-scale agriculture in Tanzania and not challenges facing livestock and poultry rearing activities in Tanzania. This implied that the students had general knowledge of agriculture but not of the challenges facing livestock keeping.

In addition, examples of incorrect responses in part (b) were that *livestock keeping is more advanced* and *livestock keeping is done to meet local demand.* The students failed to recall that these are the differences and not similarities between livestock keeping in Tanzania and Australia. For instance, *livestock keeping is more advanced* in Australia than in Tanzania when it comes to the use of machinery in activities such as milking and sheep rearing, whereas *livestock keeping is done to meet local demand* in Tanzania while in Australia it is geared towards the export market. Hence, the student revealed general knowledge on livestock keeping but failed to distinguish similarities and differences in livestock keeping between the two countries. Another student wrote about the contribution of the mining industry to the economy of Tanzania due to a lack of knowledge on livestock keeping. Extract 7.2 represents a sample of incorrect responses.

7. You were given a task to write a report on an economic activity of rearing livestock and poultry for food and commercial purposes;

(a) Briefly explain four challenges facing that economic activity in Tanzania.

   (i) Sem- nomadic Pastoralism

   (ii) Nomadism

   (iii) Sedentary pastoralism

   (iv) Transhumance

(b) Describe four similarities in conducting that activity in Tanzania and Australia.

   (i) Source of employment opportunities. The people they are get employment from activity

   (ii) Source of government revenue. from activity in Tanzania the government is improvement

   (iii) Source of foreign exchange. example the money from on nation to came of Tanzania

   (iv) Source of income. From the activity the people is get income

Extract 7.2: A sample of incorrect responses for question 7

In extract 7.2, the candidate wrote types of nomadism, which are *semi-nomadic, sedentary, transhumance, and nomadism,* instead of challenges facing rearing livestock and poultry in Tanzania, which include *poor transport, a low level of technology, pests and diseases, a lack of reliable markets, and low capital* in part (a). In part (b), the student explained the advantages of rearing livestock and poultry, which are source of employment, source of government revenue, source of foreign exchange, and source of income. Instead of similarities in rearing livestock and poultry in Tanzania and Australia, which include that both countries *keep similar types of livestock, both have set aside areas for ranches, both practice dairy farming, both keep livestock for subsistence and commercial purposes, and the development of the sector is very important for both countries.*

2.2.6 Question 8: Map Work

This question tested the student's knowledge and skills on the topic of *map work*. It had three parts: (a), (b), and (c). The students were required to read the given statement and then respond to the questions that followed. The statement is as follows: *Study the sketch map of Karagwe and then respond to the questions that follows;*

(a)   *By using grid reference, locate the position of the following features:*
  (i)   *A school*
  (ii)   *A mosque*
  (iii)   *A church*

(b)   *Name four essentials of the map that have been used to draw that sketch map.*

(c)   *Identify three methods which can be used to locate positions of features on that sketch map.*

This question was attempted by 695,107 (100%) students, of whom 212,424 (30.56%) had weak performance as they scored 0 to 2.5 marks, 333,670 (48.00%) scored 3 to 6 marks, which is average performance, and 149,013 (21.44%) scored from 6.5 to 10 marks, which is good performance. In general, the performance of the students in this question was good since 69.44 per cent of them scored 3 to 10 marks. Figure 8 illustrates the student performance in this question.
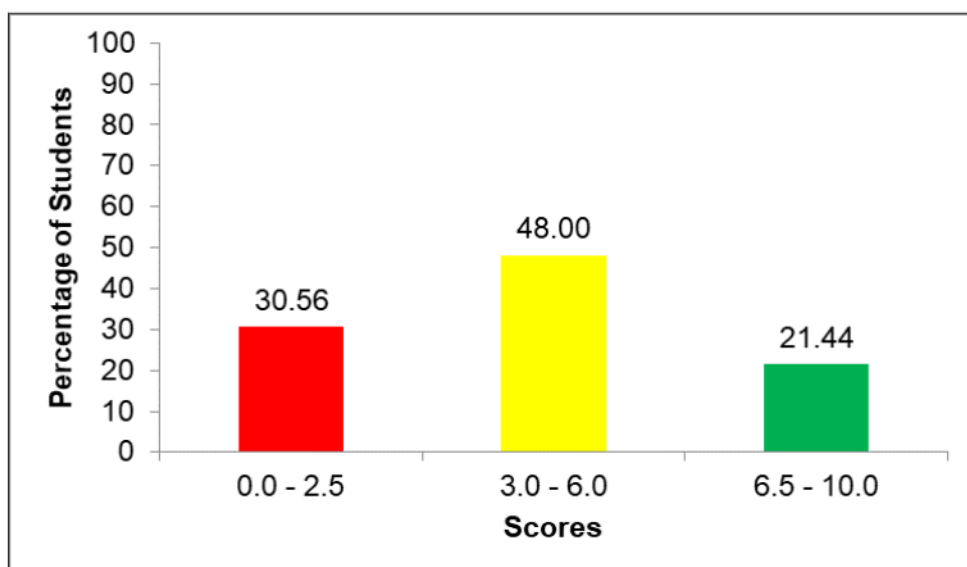

Figure 8: *Students' Performance for Question 8*

A total of 149,013 (21.44%) students with high marks demonstrated sufficient knowledge on the topic of *map work,* particularly on ways of locating positions on a map and the essentials of the map. Adequate map reading skills enabled them to locate the position of the features by using grid references such as (*i*) *a school* (570420), *(ii) a mosque* (525455), *and (iii) a church* (508468). Apart from that, in part (b), the students named four essentials of the map used to draw the sketch map, which were: *title/heading, key/legend, scale, boundary/margin/frame,* and *north direction/indicator of north/north direction.* Likewise, in part (c), they identified three methods that can be used to locate the positions of features on the map, which were: *place names, latitudes and longitudes; grid reference system/grid lines; grid numbers; eastings and northings; bearing/compass bearing; compass direction; cardinal points; and political and administrative boundaries.* However, their scores varied because of strengths of their points. Extract 8.1 represents such good responses.

8. Study the sketch map of Karagwe and then answer the questions that follows:
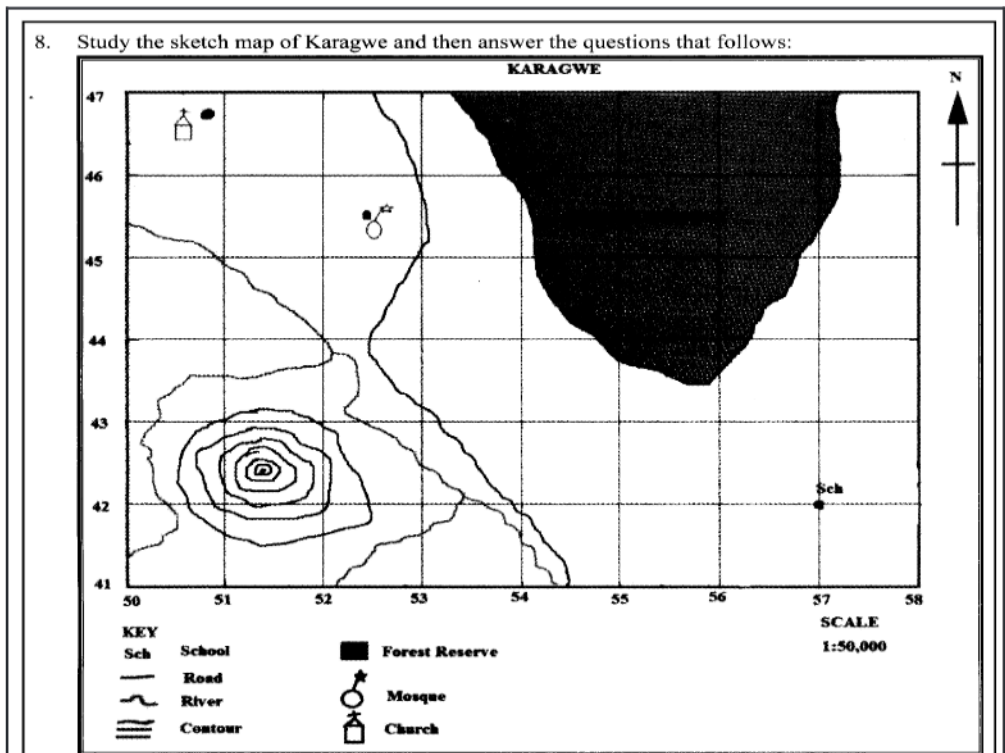
(a) By using grid reference, locate the position of the following features:
    (i)   A school.....570 420..

    (ii)   A mosque....525 455...

    (iii) A church.....508 467..

(b) Name four essentials of the map that have been used to draw that sketch map.
    (i)   Title and Margin; Shows what map is about and boundary respectively
    (ii)   Key; Defines the symbols and signs used in the map.
    (iii) Scale; Shows the relationship between map and ground distances
    (iv) North direction; Indicates the point of north in the map.

(c) Identify three methods which can be used to locate positions of features on that sketch map.
    (i)   Grid reference; A network of horizontal and vertical lines
    (ii)   Place names; By reading the names of the places indicated
    (iii) Compass bearing and direction. By using the cardinal points

Extract 8.1: A sample of correct responses for question 8

Additionally, 333,670 (48.00%) students who scored average marks had moderate knowledge about map work, especially on ways of locating positions on a map and its components. In this category, some students mixed up correct and incorrect responses in all parts. Some of them provided correct responses in part (c), whereas in parts (a) and (b), they provided incorrect responses. Furthermore, some students provided few points in parts (b) and (c), while in part (a), they provided incorrect responses.

On the other hand, 212,424 (30.56%) students who had weak performance exhibited little knowledge on map work, particularly on ways of locating positions on a map and its essentials. Some students in part (a) mentioned incorrect grid references. Examples of incorrect responses in part (a) were (i) *A school* (520649) *and a* *mosque* (507475)*; a school* (400420)*, a mosque* (32450) and *a church* (413563). This indicated that the student had general knowledge of the concept of grid reference but lacked the skill to apply it to locate the exact features shown on the sketch map. Another candidate used cardinal points to attempt to locate the features: *(i) a school* (East)*, a mosque* (West)*,* and *a church* (North) without making any reference points.

The students had general knowledge of map work but lacked skills in the application of grid reference, thus failing to locate the position of features shown on the map.

Also, examples of incorrect responses in part (b) were *bearing* and *direction*. The students failed to recall that *bearing* is the way of locating the position of a place by using degrees or angles, while *direction* is the way of locating the position of a place by using main directions or cardinal points.

On top of that, in part (c), some students provided tools for measuring distances on a map, which were *a ruler, a measuring tape,* and *a piece of string.* Some mentioned ways of finding areas of places, such as the *square or tracing method, strip method* and the *geometrical method,* while others provided the essentials of a map, such as the *title, key, and scale,* instead of ways of locating the positions of features on a topographical map. For example, in this part, one student wrote *a piece of paper, a cotton thread, and a pair of dividers.* Another student wrote *Contour.* The student failed to realise that *contour* is one of the methods of presenting relief features on a topographical map. Another student named features found on a map, such as *a mountain, a hill, and a river.* This indicated that the students had general knowledge on the topic of map work but had little knowledge on ways of locating positions on a map. Extract 8.2 represents such weak responses.

8. Study the sketch map of Karagwe and then answer the questions that follows:

KARAGWE
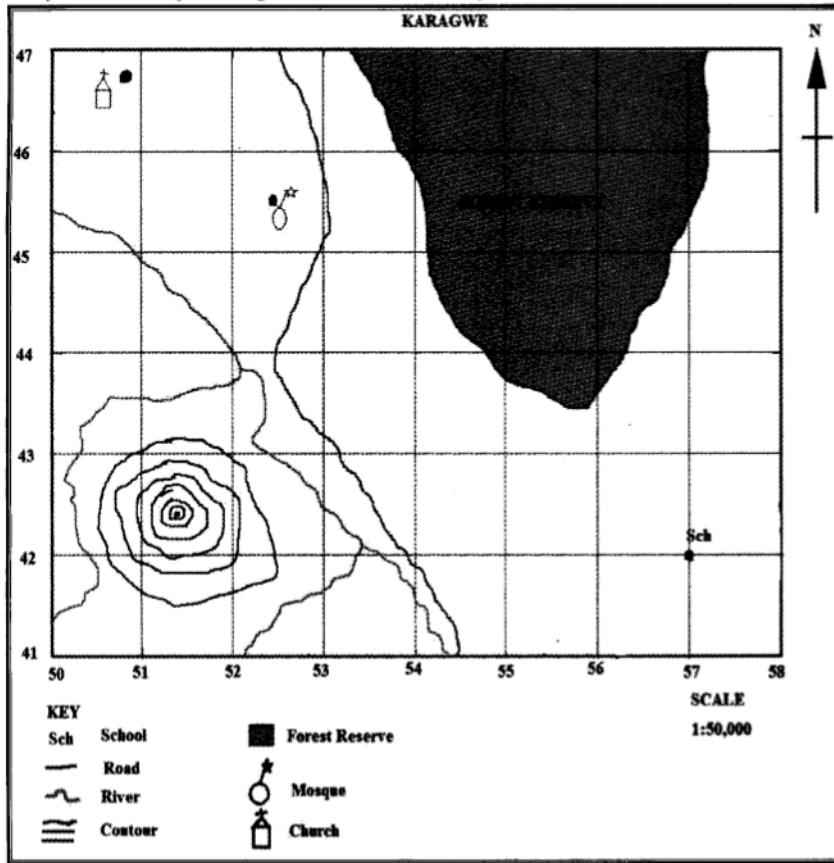
(a) By using grid reference, locate the position of the following features:
   (i)   A school. Margin
   (ii) A mosque. North direction
   (iii) A church. Title

(b) Name four essentials of the map that have been used to draw that sketch map.
   (i)   Compass bearing
   (ii) Place name
   (iii) latitude
   (iv) Grid reference

(c) Identify three methods which can be used to locate positions of features on that sketch map.
   (i)   By using a piece of paper
   (ii) By using a pair of divider
   (iii) By using a piece of thread/string

Extract 8.2: A sample of incorrect responses for question 8

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In extract 8.2, the student pointed out the essentials of the map, which are the *margin, north direction,* and *title,* instead of pointing out the grid references of the identified features, which are (*i*) *a school* (570420), (*ii*) *a mosque* (525455) and (*iii*) *a church* (508468) in part (a). In part (b), the student identified ways of locating position on the topographical map, which are *compass bearing, place name, latitude, and grid reference,* instead of the four essentials of the map used to draw the sketch map, which were *title/heading, key/legend, scale, boundary/margin/frame,* and *north direction/indication of north/north direction indicator.* Likewise, in part (c), the candidate mentioned methods of measuring the distance of a linear feature on the topographical maps, which include *using a piece of paper, using a pair of dividers, and using a piece of thread or string* instead of three methods that can be used to locate the positions of features on the map, which were: *place names, latitudes and longitudes, grid reference system/grid lines/grid numbers/Eastings and Northings, bearing/compass bearing, compass direction/cardinal points, political and administrative boundaries.*

2.2.7   Question 9: Climate

In this question, the students were required to read the data on the given weather and then respond to the questions that followed. The question read as follows: *Read the weather data for Greenland and answer the questions that follow:*

MONTH	J	F	M	A	M	J	J	A	S	O	N	D
Temp (⁰C)	-18.9	-17.2	-10.6	0.5	10.5	16.7	19.4	16.1	10	1.7	-8.9	-15.6
Rain (mm)	7.6	5	7.6	10.2	25.4	35.6	45.6	40.6	22.9	22.9	17.8	15.2

(a)   *Identify the type of the climate for the given area*
(b)   *Describe two characteristics of the type of the climate identified in (a)*
(c)   *With examples, describe three possible activities, which might be taking place in an area with the type of climate you mentioned in (a).*

The question was attempted by 695,107 (100%) students, of whom 585,017 (84.16%) had weak performance as they scored 0 to 2.5 marks, 105,591 (15.19%) scored 3 to 6 marks, which was average performance, and 4,499 (0.65%) scored 6.5 to 10 marks, which is good performance. In general, the performance of the students in this question was weak since only 15.84 percent of the students scored 3 to 10 marks. Figure 9 illustrates the students' performance for this question.
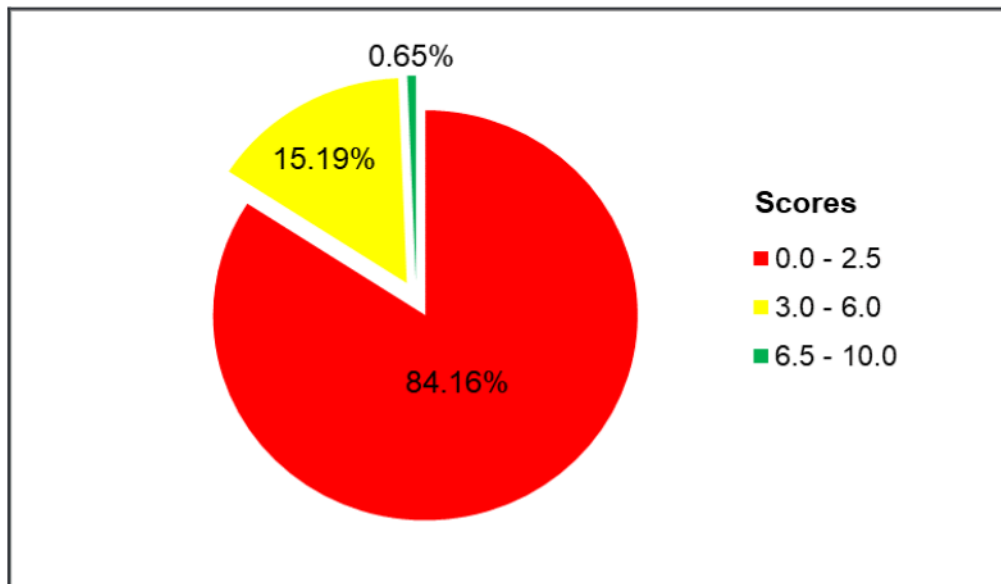

Figure 9: *Students' Performance for Question 9*

Further analysis indicates that 585,017 (84.16%) students who got lower marks had little knowledge about types of climate, characteristics of climatic regions, and the relationship between climatic regions and human activities. In this category, some students in part (a) mentioned the elements of weather. In part (b), they mentioned the scale of measurements, while in part (c), they mixed up correct and incorrect responses. Some students, in part (a), provided characteristics of climate. In part (b), they mentioned types of climate, while in part (c), they provided correct responses.

Other students provided correct responses in part (a), while they mentioned only one point for each part (b) and (c). For example, one student in part (a) identified the type of climate as *high rainfall* instead of *tundra/polar climate*. This student failed to recall that *high rainfall* is one of the characteristics of an equatorial climate. In part (b), the student mentioned

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equatorial climate and *desert climate.* This indicated that the students had general knowledge of the concept of climate but could not identify the types and their characteristics.

On the other hand, 4,499 (0.65%) students who scored high marks revealed adequate knowledge on the topic of climate, especially on types of climate, characteristics, and their relationship with human activities. Awareness of the concept enabled students to respond correctly in all parts. For example, in part (a), they identified the type of climate as the *Tundra climate.* In part (b), they described two characteristics of climate: *low temperature, small annual precipitation, low humidity, natural vegetation consisting of mosses, lichen,* and *severe cold conditions,* and *high pressure due to the low temperature.* Additionally, in part (c), they described three possible activities that might take place in an area: *fishing, e.g., walrus and whales; hunting, e.g., hunting Arctic fox; rearing of livestock, e.g., reindeer and sheep;* and *tourism, e.g., wildlife viewing.* However, the strengths of their points led them to vary in their scores. Extract 9.1 represents a sample of such a good response to this question.

9. Read the weather data of Greenland and answer the questions that follow.

MONTH	J	F	M	A	M	J	J	A	S	O	N	D
Temp(°C)	-18.9	-17.2	-10.6	0.5	10.5	16.7	19.4	16.1	10	1.7	-8.9	-15.6
Rain(Mm)	7.6	5	7.6	10.2	25.4	35.6	45.6	40.6	22.9	22.9	17.8	15.2

(a) Identify the type of the climate for the given area.

.....Tundra....climate..

(b) Describe two characteristics of the type of the climate identified in (a).

(i) ...It has low temperatures throughout the year which make it to have low in humidity.

(ii) ...It has low rainfall due to low humidity and it is always in snow form and ranges to about 250mm per year.

(c) With examples, describe three possible activities which might take place in an area with the type of climate you mentioned in (a).

(i) ...Hunting and gathering; due to presence of some animals like polar bears who can live in cold conditions

(ii) ...Rearing or keeping of livestock like deers who can be used for food

(iii) ...Tourism activities due to presence of ice hills which can be used in the skating and also some cold resistant animals like deers and penguins which can be a tourist attraction.

Extract 9.1: A sample of correct responses for question 9

Likewise, 105,592 (15.19%) students with average performance possessed moderate knowledge about types of climates, their characteristics, and their relationship with human activities. In this category, some students provided correct responses in parts (a) and (c), while in part (b), they mixed up correct and incorrect responses. An example of an incorrect response was *high rainfall* in part (b). The student revealed general knowledge on the topic of climate but failed to recall specific characteristics of the *Tundra climate* because *high rainfall* is a characteristic of the Equatorial climate. Another student wrote in part (a) *Equatorial climate* instead of *Tundra*. Part (b) provided correct responses, while Part (c) mentioned activities such as *mining, lumbering,* and *trading* instead of *fishing, hunting, livestock keeping, and tourism*. This student showed general knowledge on the topic of climate but could not distinguish the types of climate and specific activities taking place.

2.3   SECTION C- ESSAY QUESTION

2.3.1   Question 10: The Solar System

The students were given the statement that: *The Earth has two kinds of movements that cause changes on the earth's surface.* Then, they were required to *describe four effects for each type of those movements.*

This question was attempted by 695,107 (100%) students, of whom 531,868 (76.52%) had weak performance as they scored 0 to 2.5 marks, 117,964 (16.97%) scored 4.5 to 9.5 marks, which is average performance, and 45,268 (6.51%) scored 10 to 15 marks, which indicates good performance. The general performance of the students in this question was weak, as 23.48 percent of the students scored 4.5 to 15 marks. Figure 10 illustrates the students' performance for this question.
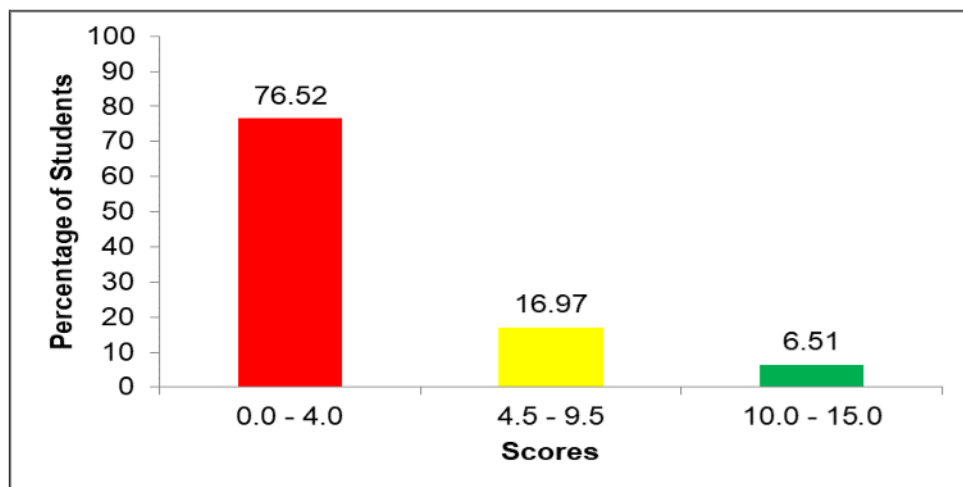

Figure 10: *Students' Performance in Question 10*

The analysis indicates that 531,868 (76.52%) students with lower scores had little knowledge about the effects of Earth's movements. For instance, some students wrote about the effects of the Earth's movements in general without explaining them separately. Some of them explained the effects of only one type of movement. Other students explained one effect for each type, while others mentioned four effects for each without explanations. For example, one student provided a relevant introduction and mixed up correct and incorrect effects by saying that the effects of Earth's rotation

were *seasons* and *eclipses.* The students failed to recognise that these were the effects of the Earth's revolution, whereas incorrect responses for the Earth's revolution were *wind deflation* and *differences in time.* Similarly, the students failed to identify that these are the effects of Earth's rotation. Therefore, this revealed that the student had general knowledge about Earth's movements but could not clearly distinguish the effect of each movement. Extract 10.1 illustrates incorrect responses to this question.

Extract 10.1: A sample of incorrect responses for question 10

In extract 10.1, the student has explained transport and two types of transport, which are land transport and road transport, in the introduction part, contrary to the requirement of the question. In the body, the student explained the effects of both land and road transport instead of two kinds of earth movement, which are rotation and revolution, and their effects such as *day and night, difference in time between places located at different longitudes, gain or loss of a day when crossing the international dateline, daily rising and falling of the sea tides* and *deflections of the wind and ocean currents* for rotation and *change in seasons, aphelion and perihelion, changes in the latitude of the overhead sun,* and *varying lengths of the day and night at different times of the year* for revolution of the earth.

A total of 117,964 (16.97%) students who had moderate performance revealed moderate knowledge about the earth's movements. Some of them provided weak introductions and mixed up correct and incorrect responses with irrelevant conclusions. Others provided a relevant introduction, explained a few points partially, and ended up with a weak conclusion, whereas some students provided a good introduction and explained a few points correctly with a weak conclusion.

On the other hand, 45,268 (6.51%) students with high marks showed sufficient knowledge on the topic of *the solar system,* specifically on the effects of the earth's movements. Adequate knowledge enabled them to provide the correct responses. For example, some students provided a relevant introduction, main body, and conclusion. Moreover, they described four effects of the rotation of the earth based on the following: *day and night, difference in time between places located at different longitudes, gain or loss of a day when crossing the international dateline, daily rising and falling of the sea tides,* and *deflections of the wind and ocean currents.*

In addition, they described four effects of the revolution of the earth based on the following: *change in seasons (aphelion, perihelion), changes in the latitude of the overhead sun,* and *varying lengths of day and night at different times of the year.* In addition, they ended up with a relevant conclusion. The strengths of their points led them to vary in their marks. Extract 10.2 illustrates the correct responses for this question.

10. The Earth has two kinds of movements which cause changes on the Earth's surface. Describe four effects for each type of those movements.

.... Earth's rotation is the movement of the earth's surface rotating ....
on its own axis. It rotates from West to East in anticlockwise direction .
It moves about 360° to complete one rotation. It take 24 hours to the .....
earth to complete one rotation. The earth rotates for 1400 km/hr ....
on its own axis. An axis is an imaginary line that runs from the .....
North to South pole through the centre of the earth. The following .....
diagram illustrates earth rotation. The following are the effects .....
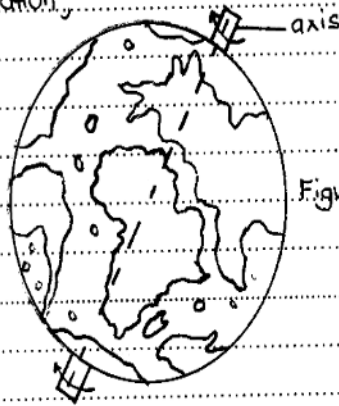of earth rotation;

Figure 1: Represents earth rotation.

.... Occurance of day and night; As the earth rotates on its own ....
axis, one side faces the sun rays direction. This side receives light ....
and becomes day while one side doesn't receive any sun rays. hence.....
it becomes night. Day is governed by light while during night, there is ....
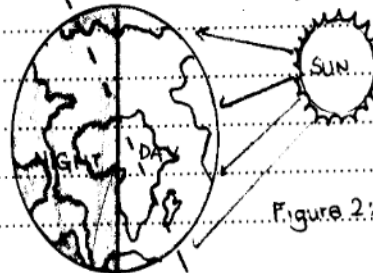no light from the sun. The following diagram represent this .....

Figure 2: Represents day and night

10. .... Difference in time in longitudes; Longitudes are imaginary lines ......
measured in degrees drawn West and East of the Prime Meridian. As the
earth rotates through 1°, there is a time difference of 4 minutes. And
also as it rotates through 15°, there is a time difference of 1 hour. This
results to differences in time in places such as Dares Salaam at
45° E and Accra, Ghana at 0° have two difference in time which is
a three hour difference.

.... Deflection of winds and ocean currents; During earth rotation
a type of force namely coriolis force is made which deflects winds
and ocean currents on the atmospheric belts to the west or to the
east. Ocean currents and winds occur on earth's surfaces; Such as
cold and warm ocean currents accompained by moist and dry winds
to the earth's surface.

.... Occurance of high tides and low tides; Tides is the periodic
rise or fall of water level in oceans due to gravitational pull from
the earth and moon. High tides and low tides are caused by
earth rotation, as when the earth rotates, it experiences a pull from
the moon experiencing tides. The following diagram illustrates
high and low tides.
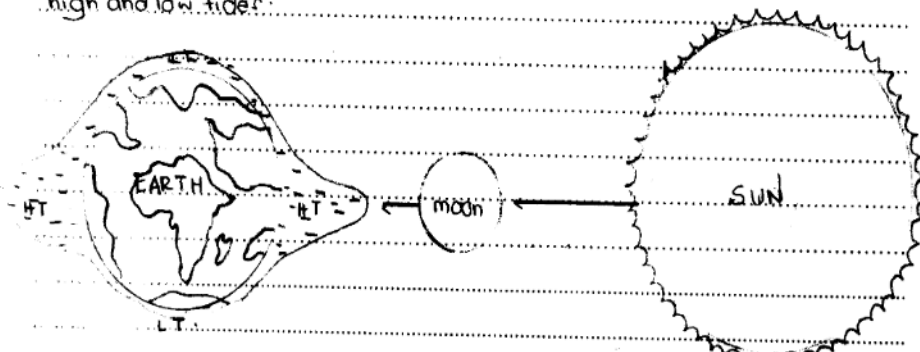

Figure 3 shows high tides (HT) and low tides (LT)
.... Earth's revolution is the movement of the earth's surface
around the sun through an orbit. An orbit is an eliptical path that
planets use to revolve around the sun. It takes 365¼ days for the
earth to complete one revolution. This is one year. But sometime d.
it takes 366 days as one day is added from ¼ day for 4 years.

10. This is the presence of 29th February in the calendar. The following are the effects of earth's revolution;

Occurance of seasons of the year; Seasons occur every year. There are four seasons which are spring, winter, autumn and summer. Winter occurs November, December and January in the Northern hemispher. Spring in February, March and April. Summer in May, June and July. Autumn in August, September and October. And these seasons differ in the Southern hemisphere.

Occurance of eclipses; An eclipse is the total or partial blockage of light by one body to another body. There are two types of eclipses which as solar and lunar eclipse. Solar eclipse is the eclipse in which the moon passes in between the sun and earth. Lunar eclipse is the eclipse in which the earth pases in between the sun and moon. It is caused during when earth revolves, it goes in a straight line causing such eclipses.

Figure 4 represents lunar eclipse.
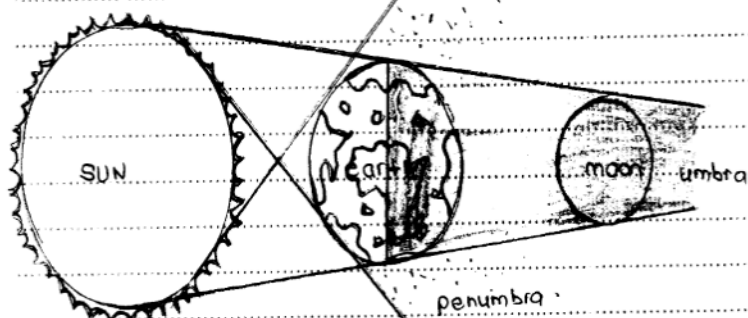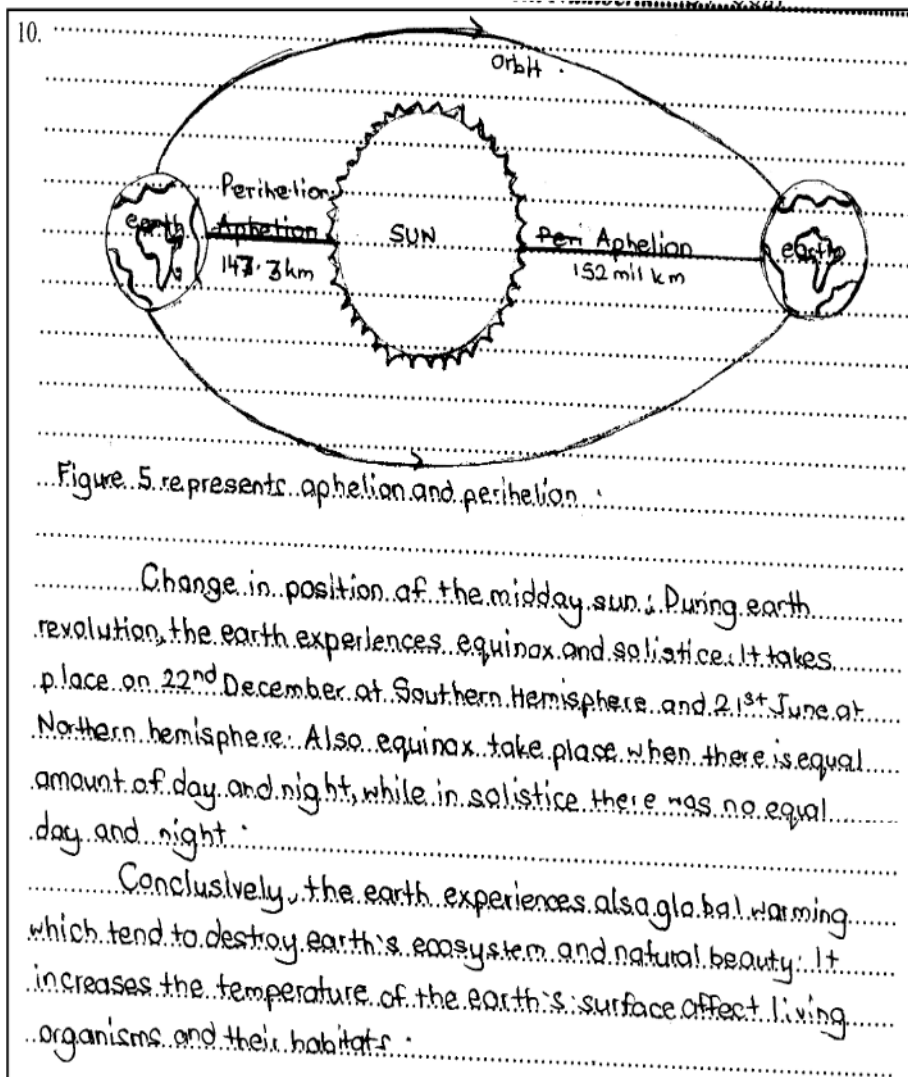
Occurance of aphelion and perihelion; Aphelion is the farthest position of the earth from the sun. The earth is 152 mil km away from the sun. It occurs every 4th July. Perihelion is the closest or nearest position of the earth from the sun. The earth is 147.3 mil km away from the sun. It occurs every 3rd January. This occurs due to the orbit being elliptical and with a big wide shape.

Figure 5 represents aphelion and perihelion

Change in position of the midday sun. During earth revolution, the earth experiences equinox and solistice. It takes place on 22nd December at Southern Hemisphere and 21st June at Northern hemisphere. Also equinox take place when there is equal amount of day and night, while in solistice there has no equal day and night.

Conclusively, the earth experiences also global warming which tend to destroy earth's ecosystem and natural beauty. It increases the temperature of the earth's surface affect living organisms and their habitats.

Extract 10.2: A sample of correct responses for question 10

1.0 ANALYSIS OF THE STUDENTS' PERFORMANCE IN EACH TOPIC

The FTNA 2023 paper in Geography consisted of 10 questions that were set from 13 topics, namely: *the solar system, major features of the Earth's surface, water management for economic development, transport, map work, tourism, agriculture, sustainable use of forest resources, sustainable use of power and energy resources, weather, sustainable mining, manufacturing industry,* and *climate.*

The analysis of the students' performance per topic in Geography FTNA 2023 revealed that students had a good performance in the following topics: *sustainable use of power and energy resources* (79.62%), *the solar system, major features of the earth's surface, water management for economic development, transport, map work, tourism, agriculture, and sustainable use of forest resources* (76.44%) *and map work* (69.44%) that were tested in questions 2, 1, and 8, respectively. Also, the students had average performance in the topics of *agriculture* (40.32%), *manufacturing industry* (36.11%), *and sustainable mining* (31.66%), which were tested in questions 7, 6, and 5, respectively. On the contrary, the performance of students was weak in the topics of *weather* (25.37%), *climate* (15.84%), and the *solar system* (15.82%), which were assessed in questions 3, 9, 4, and 10, respectively. (See appendix).

3.0   CONCLUSION

The analysis of individual questions showed that the general students' performance of the 2023 Geography subject (FTNA) was average since 53.78 per cent of the students passed and 46.22 per cent failed. The level of performance has decreased by 1.22 per cent in relation to that of 2022, where 55.00 percent of students passed. The students who passed the assessment demonstrated awareness of the demands of the questions, adequate knowledge of the subject matters tested, good essay writing skills, adequate mathematical skills, and a good command of the English language, whereas the students who failed the assessment displayed contrary attributes.

4.0   RECOMMENDATIONS

Based on the Students' Item Response Analysis (SIRA) for Geography FTNA 2023 provided in this report, it is recommended that:

(a) Teachers should design simple practical exercises using the globe and torch to guide students' demonstrations and discussions on the significance and effects of different Earth's movements.

(b) Teachers should assess the students at the end of each topic so as to evaluate their understanding of the topic before moving on to the next topic. In so doing, the teachers will be aware of the challenges that the students face in a particular topic, and that, in turn, will help in designing and developing the teaching methods to improve the students' understanding.

(c) During the teaching and learning process, teachers should do effective demonstrations on weather and climate by using real scenarios, pictures, and videos showing weather and climate, their relationship, and their impact on the Earth's environment.

(d) Teachers should prepare and use study tour teaching strategies for weather stations, forested areas, river basin management projects, mining sites, and areas with different features to improve students' competence. This will increase students' performance in the weather and climate sub-topics as well as in the Major Features of the Earth's Surface topic.

(e) The question-and-answer method should be used effectively to discuss how various questions are tested. This will help to improve the performance of students.

(f) Teachers should put more emphasis on developing students' mathematical skills in order to improve their computation skills in calculating time by using longitude lines.

(g) Students should be trained to read questions carefully in order to identify the requirements of each question while doing their school-based assessments being it Formative or Summative. This will overcome the challenges of the students' inability to identify the requirements of the questions in the future Geography FTNA.

Students' Performance Per Topic in Geography FTNA 2023

S/N	Topic	Question Number	% of students who scored 30 marks and above	Remarks
1.	Sustainable Use of Power and Energy Resources	2	79.62	Good
2.	The Solar System, Major Features of the Earth's Surface, Water Management for Economic Development, Transport, Map Work, Tourism, Agriculture and Sustainable Use of Forest Resources.	1	76.44	Good
3.	Map Work	8	69.44	Good
4.	Agriculture	7	40.32	Average
5.	Manufacturing Industry	6	36.11	Average
6.	Sustainable Mining	5	31.66	Average
7.	Weather	3	26.5	Weak
8.	Climate	9	21.9	Weak
9.	Solar System	4	8.6	Weak