THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

CANDIDATES' ITEM RESPONSE ANALYSIS REPORT ON THE CERTIFICATE OF SECONDARY EDUCATION EXAMINATION (CSEE) 2023

GEOGRAPHY

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013 GEOGRAPHY

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FOREWORD

The National Examinations Council of Tanzania (NECTA) is pleased to issue the Candidates' Items Response Analysis (CIRA) report for the Certificate of Secondary Education Examination (CSEE), 2023 in the Geography subject. The report has been prepared to inform teachers, parents, policymakers, prospective candidates, and the public in general on the performance of the candidates who sat for this examination.

This report analyses the candidates' performance for each question using statistical data. Furthermore, samples of responses from the scripts of the candidates are used for elaboration. The report also highlights some of the factors that made the candidates fail to score high marks on the questions. The factors include the inability to understand the demands of the questions, insufficient knowledge of the topics tested, and poor proficiency in the English language. Likewise, the analysis highlights some of the factors that made some of the candidates score high marks. The factors include the ability to understand the demands of the questions, candidates' sufficient knowledge, good proficiency in the English language, and good skills in the subject content.

It is anticipated that the feedback in this report will empower education administrators, school quality assurers, school managers, teachers, and students in various capacities to devise effective strategies for enhancing the teaching and learning of geography.

The National Examinations Council of Tanzania expresses its sincere gratitude to everyone who participated in the preparation of this report.

Dr. Said Ally Mohamed
EXECUTIVE SECRETARY

1.0 INTRODUCTION

This Candidates' Item Response Analysis (CIRA) presents candidates' performance in the Geography subject in the Certificate of Secondary Education Examination (CSEE), which was conducted in November 2023. The examination was set as per the 2005 Geography syllabus and the 2019 Geography subject examination format.

The analysis was done based on each question and item. Specifically, it indicates the requirement of each question, the expected responses from the candidates, and sample responses from the candidates' scripts. The questions analysed were set on various topics focusing on competencies.

The analysis of candidates' performance was done based on three categories: first, the candidates who performed well on different questions and the reasons that contributed to the good performance; second, the candidates who scored average marks and the reasons for their performance; and lastly, the candidates whose performance was poor and the reasons for their performance. Their performance levels are analysed into five grades: A, B, C, D and F, with the following intervals: 75–100 (Excellent), 65–74 (Very Good), 45–64 (Good), 30–44 (Satisfactory), and 0–29 (Fail), respectively. The pass mark is 30 percent, that is, candidates who obtained grades ranging from A to D are considered to have passed.

Good performance ranges from 65 to 100 percent; it is represented by the green colour. Average performance ranges from 30 to 64 percent; it is represented by the yellow colour. Weak performance ranges from 0 to 29 percent, and it is represented by the red colour. The candidate's performance on each topic is summarised in the appendix.

The number of candidates who sat for the Geography examination in November 2023 was 528,506. Among them, 64.32 percent passed with different grades, while 1.78 percent failed. On the contrary, 520,841 candidates sat for the examination in 2022. Among them, 66.10 percent passed with different grades, while 33.9 percent failed. This indicates that the performance in the Geography examination in 2023 decreased by 1.88 percent compared to that in 2022.

2.0 ANALYSIS OF CANDIDATES' RESPONSES TO EACH QUESTION

2.1 SECTION A: Multiple Choice and Matching Item Questions

This section is composed of two compulsory questions with a total of 16 marks. Question 1 consisted of 10 multiple choice items, carrying a total of 10 marks and question 2 consisted of one matching item with six premises, which carried a total of 06 marks making a total of 16 marks for both questions.

2.1.1 QUESTION 1: Multiple Choice Questions

This question required the candidates to choose the correct response from the five given alternatives by writing the letter of the correct response in the answer booklet provided. The question tested the candidates' knowledge of *Solar System, Soil, Transport, Agriculture, Forces that Affect the Earth, Human Population, Sustainable Mining,* and *Manufacturing Industry* topics. Each item carried 1 mark making a total of 10 marks.

A total of 528,506 (100%) candidates attempted this question. Data analysis on the performance showed that 169,509 (32.07%) candidates scored from 00 to 02 marks, 270,158 (51.12%) scored from 03 to 06 marks and 88,839 (16. 81%) scored between 07 to 10 marks. The overall performance on this question is presented in Figure 1.

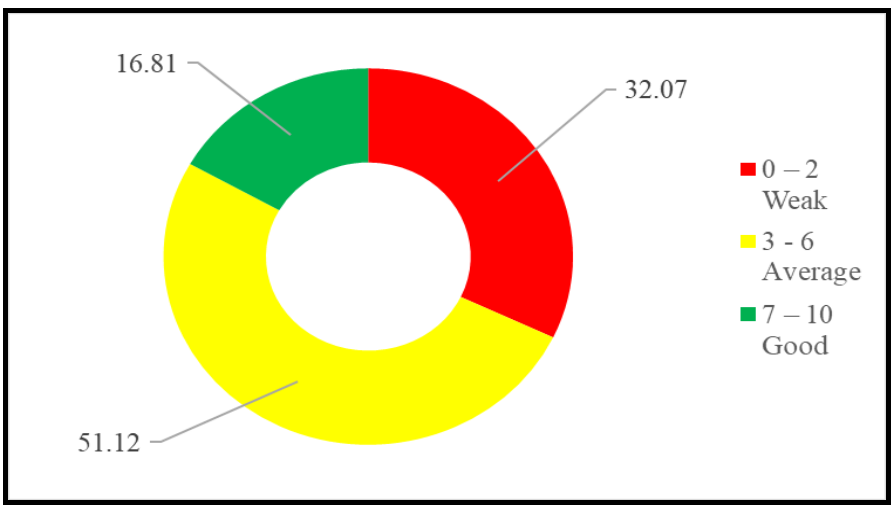


Figure 1: *The candidates' performance for question 1*

Figure 1 shows that the general performance for this question was good because 67.93 percent of the candidates had average scores and above (3 to

10 marks). Those candidates had adequate knowledge of the content covered in these items.

The following section analyses the candidates' performance on items (i) to (x) of Question 1.

(i) What will happen when the orbit of a heavenly body is nearest to the Sun?

A Perihelion *B Aphelion* *C Sunrise*
D Equinox *E Sunset*

The correct response for this item was A, *Perihelion.* The candidates who chose the correct response had good knowledge of the concept of *the Solar System,* particularly on the effects of the Earth's revolution. Contrary to that, candidates who chose distractor B, *Aphelion,* were aware of the effects of revolution; however, they failed to recall that Aphelion happens when the orbit of the celestial body is at its farthest position from the sun. Apart from that, those who opted for distractors C, *Sunrise,* and E, *Sunset*, had inadequate knowledge, as they failed to remember that those are either the effects of the Earth's rotation or the evidence of the spheroid shape of the Earth, while those who chose distractor D, *Equinox,* failed to realize that Equinox is the equal length of day and night that occurs on March 21st and September 23rd of every year.

(ii) At the road construction site, John saw a layer of land with the finest soil particles and more humus. Identify the layer observed by him.

A B horizon *B E horizon* *C D horizon*
D A horizon *E C horizon*

The correct response for this item was option D, *A-horizon.* Those who chose the right answer knew enough about the soil profile to remember that the *A-horizon* has the smallest soil particles and the most humus. Those who chose the wrong answer, on the other hand, knew more about the soil profile in general, mostly about the composition of the *E-horizon* (weathered rock fragments), *C-horizon* (bedrock), and *D-horizon* (small soil particles). Contrary to that, the candidates who chose distractor B, *E-horizon*, had inadequate knowledge about the soil profile since there is no E-horizon in the soil profile.

(iii) Keino wants to transport his car from Japan and Tanzania. Which mode of transport would be the best to use?

A Water *B Pipeline* *C Cable*
D Animal *E Road*

The correct response for this item was option A, *water.* The candidates who opted for the correct response had adequate knowledge of the topic of *Transport,* particularly on the subtopic of the main modes of transport. They were aware that water was the only mode of transport among the given alternatives that could transport goods from Japan to Tanzania. On the other hand, those who opted for distractors B, *Pipeline,* D, *Animal,* C, *Cable,* and E, *Road* had a general understanding of the various modes of transportation.

(v) Sometimes people living in the central part of Tanzania experience sudden vibrations of the Earth's surface caused by the movement of the molten rocks below or within the crust. Identify the instrument to be used to measure the magnitude of such vibrations.

A Hygrometer *B Thermometer* *C Wind vane*
D Richer scale *E Barometer*

The correct response for this item was option D on the *Richter scale*. The candidates who chose the correct response had a good understanding of the topic of the *forces that affect the Earth internally*, particularly the subtopic of earthquakes. In particular, they were able to recall that an earthquake is characterised by a sudden vibration of the earth's surface, which is caused by the movement of molten materials or rocks beneath or within the crust. The Richter scale is used to measure the magnitude of an earthquake. On the other hand, candidates who chose distractors A, *hygrometer,* B, *thermometer,* C, *wind vane,* and E, *barometer,* failed to recognise that these are the instruments used to record or measure atmospheric conditions, in the sense that hygrometer measures humidity, thermometer measures temperature, wind vane shows direction of the wind, and barometer measures atmospheric pressure.

(vi) Coastal areas do not maintain their shape due to erosional and depositional processes. Which factors influence those processes?

i. The strength of the wind that blows over the sea

ii. Weather conditions in the area
iii. The depth of the seawater along the coast
iv. The nature of the rocks on the coast

A (i), (ii), and (iv) B (i),(ii) and (iii) C (i),(iii) and (iv)
D (ii),(iii) and (iv) E (ii) and (iv)

The correct response for this item was option *C, (i), (iii), and (iv).* The candidates who selected the appropriate response demonstrated a strong comprehension of the *external forces that affect the Earth's crust,* particularly erosion and deposition caused by wave action. They were able to analyze the factors that influence the changes in the shape of the coastline which were; (i), *the strength of the wind that blows over the sea;* (ii), *the depth of the seawater along the coast;* and (iv), *the nature of the rocks on the coast*. On the other hand, candidates who chose distractors A, *(i), (ii) and (iv),* B, *(i), (ii) and (iii),* D, *(ii), (iii) and (iv),* as well as E, *(ii) and (iv),* had inadequate knowledge about the subject matter since weather conditions in the area do not influence shaping coastal areas.

(vii) It is noon in Addis Ababa (39^0 E). What will be the time in Dar es Salaam which is located along the same longitude?

A 12:00 pm B 12:00am C 06:00pm
D 11:00am E 06:00am

Option A, *12:00 pm* was the correct response for this item. The candidates who chose the correct response had good knowledge of the concept of *parallels and meridians,* specifically the time zone. They were aware of the fact that countries with the same longitude experience the same time. Conversely, those who selected distractor B at *12:00 am* were aware of parallels and meridians specifically related to time zones, but they overlooked the fact that *12:00 noon* is not considered ante meridian (a.m.), meaning before mid-day, but rather post meridian (after mid-day). Conversely, those who selected distractors C at 06:00 pm, D at 11:00 am, and E at 06:00 am lacked sufficient knowledge about parallels and meridians, particularly concerning time zones. As a result, they failed to recognise that all places along the same longitude experience midday at the same time.

(viii) Which factors cause Tanzania's population structure to be dynamic?

A Fertility, mortality, and migration
B Fertility, mortality, and migration
C Fertility, fecundity and migration
D Mortality, fertility and fecundity
E Migration, mortality and fecundity
F Mortality, emigration and fecundity

The correct response for this item was A, *fertility, mortality, and migration*. The candidates who opted for response A had a good understanding of the topic of the *Human Population,* particularly on the subtopic of population change. They also managed to identify the factors that influence human population change. In contrast, candidates who selected distractor B, which includes *fertility, fecundity, and migration*; candidates who chose distractor C, which includes *mortality, fertility, and fecundity;* candidates who chose D, which includes *migration, mortality, and fecundity;* and candidates who chose E, which includes *mortality, emigration, and fecundity,* possessed a general understanding of the human population. However, they failed to recognize that fecundity does not influence population, while emigration is a form of migration.

(ix) What could be the appropriate method for extracting gold deposits which are near to the surface?

A Shaft mining *B Underground mining*
C Ope cast mining *D Alluvial mining*
E Placer mining

The correct response for this item was option C, *open-cast mining*. The candidates who chose the appropriate response demonstrated a sufficient level of knowledge on the topic of *Sustainable Mining,* particularly about the mining methods. They were aware that methods of mining depend on the location of minerals within the earth's crust. Thus, they were able to recall that the open-cast method is the most effective way to extract gold from deposits that are close to the surface. Contrary to that, candidates who opted for A, *shaft mining,* B, *underground mining,* D, *alluvial mining, and* E, *placer mining,* were aware of the methods of mining but failed to identify the appropriate method for extracting the gold deposits. Hence,

they could not recognize a specific method for extracting minerals that are near the surface.

(x) Why are Japanese ship-building industries located along the coast?

A Government policy *B Presence of skilled labour*
C Availability of capital *D Good supply of power*
E The presence of natural harbours

The correct response for this item was E*, The presence of natural harbours*. The candidates who chose the correct response had sufficient knowledge about the topic of the manufacturing industry, particularly the factors influencing the location of industries. They understood that other factors also play a significant role in determining the general location of industries. Ship-building industries should be located along the coast with natural harbours to facilitate the easy acceleration of the completed manufactured ship into the ocean. Those candidates who opted for distractors A, government policy, B, the presence of skilled labour, C, the availability of capital, and D, a good supply of power, failed to realise that those are the general factors for the location of industries, but for ship industries, they have to be located near water bodies with natural harbours for the easy acceleration of manufactured ships into the water.

2.1.2 QUESTION 2: Matching Item Questions

This question had six (6) items in List A and eight (8) alternatives in List B. The candidates were instructed to match each description of *environmental issues and managemen*t in List A with their corresponding *environmental concepts* in List B, by writing the letter of the correct answer beside the item number in the provided answer booklet.

The matching items were as follows;

List A	List B
(i) A state in which an area experiences a prolonged dry period.	A Desertification
(ii) Addition of unwanted substances into the environment.	B Deforestation
(iii) Deterioration of the quality of the land through loss of soil fertility.	C Loss of biodiversity
(iv) Gradual changes of rainfall and temperature in a place.	D Drought
(v) Processes that lead to the perish of plant and animal species in an area.	E Soil erosion
(vi) Process through which fertile land becomes dry, waterless, and without vegetation.	F Land degradation
	G Climate change
	H Pollution

The question was attempted by 528,506 (100%) candidates. Among them, 99,878(18.90%) scored from 00 to 01 marks, 164,806 (31.18%) scored from 02 to 03 marks, and 263,888 (49.92%) scored from 04 to 06 marks. Figure 2 summarizes this performance.

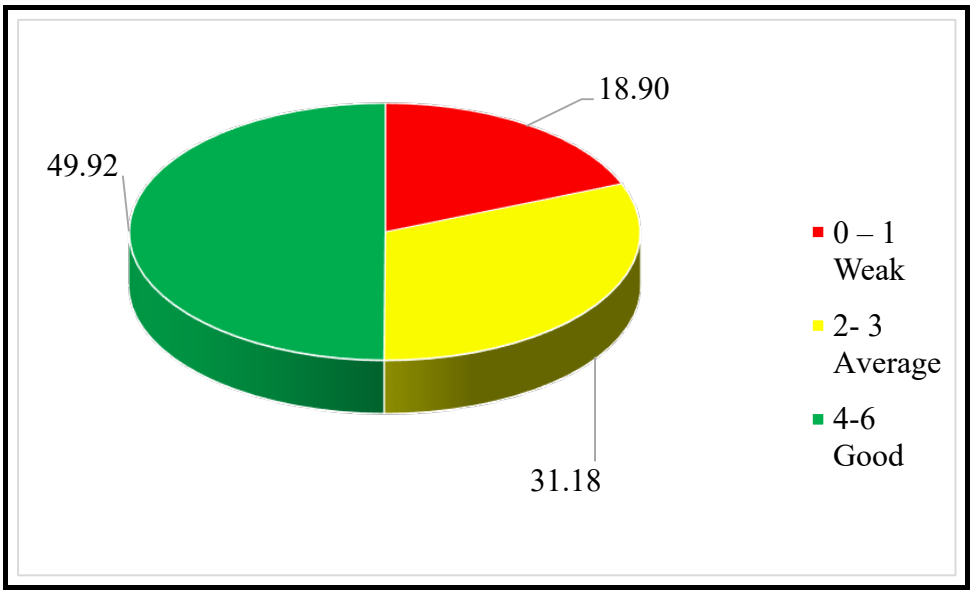


Figure 2: *The percentage of candidates' performance on question 2*

Figure 2 shows that performance for this question was good, as 81.10 percent of the candidates scored from 2 to 6 marks; within them, 49.92 percent had higher performance and 31.18 percent had average performance.

A total of 263,822 (49.92%) candidates who had a good performance(04-06 mark) demonstrated adequate knowledge of the concept of *Environmental Issues and Management*, particularly about environmental problems. They were able to correctly match various descriptions of environmental problems in List A to their corresponding environmental concepts in List B. That is (i), *D, – Drought,* (ii), *H, -Pollution,* (iii), *F - Land degradation* (iv), *G - Climate change,* (v), *C - Loss of Biodiversity* and (vi), *A - Desertification.*

On the other hand, 164,806 (31.18%) of candidates with moderate performance had insufficient knowledge of *environmental issues and management.* These candidates were unfamiliar with some items. This resulted in the correct responses to 2 or 3 out of the 6 items.

In addition to this, candidates who had weak performance had a low level of understanding of environmental issues. Some of them correctly matched only one item in List A with its corresponding environmental problem while others failed to match correctly any item. In this category, candidates scored from 00 to 01 because of their insufficient knowledge about the subject matter.

2.2 SECTION B: SHORT ANSWERS QUESTIONS

This section comprised six (6) compulsory questions: 3, 4, 5, 6, 7 and 8. Each question weighed 09 marks. Therefore, the whole section had 54 marks. The analysis of each question is as follows:

2.2.1 QUESTION 3: Map Reading and Map Interpretation

This question assessed candidates' knowledge and skills in *Map Reading* and *Interpretation.* It had parts (a), (b), (c), and (d). The candidates were instructed to carefully study the map extract of Liwale (sheet 280/4) and respond to the provided questions.

(a) Giving a reason, identify the dominant type of rock in the mapped area.

(b) Describe the three characteristics of the rock mentioned in (a).
(c) Briefly describe two possible reasons for the growth of Liwale town.
(d) By using the RF scale, measure the distance of a road in kilometers from grid reference 814218 to 809165.

The question was attempted by 528,506 (100%) candidates, with 338,997 (64.14%) scoring from 00 to 2.5 marks, 160,310 (30.33%) from 3 to 6.5 marks, and 29,199 (5.52%) from 7 to 9 marks. Figure 3 illustrates the performance of candidates in this question.

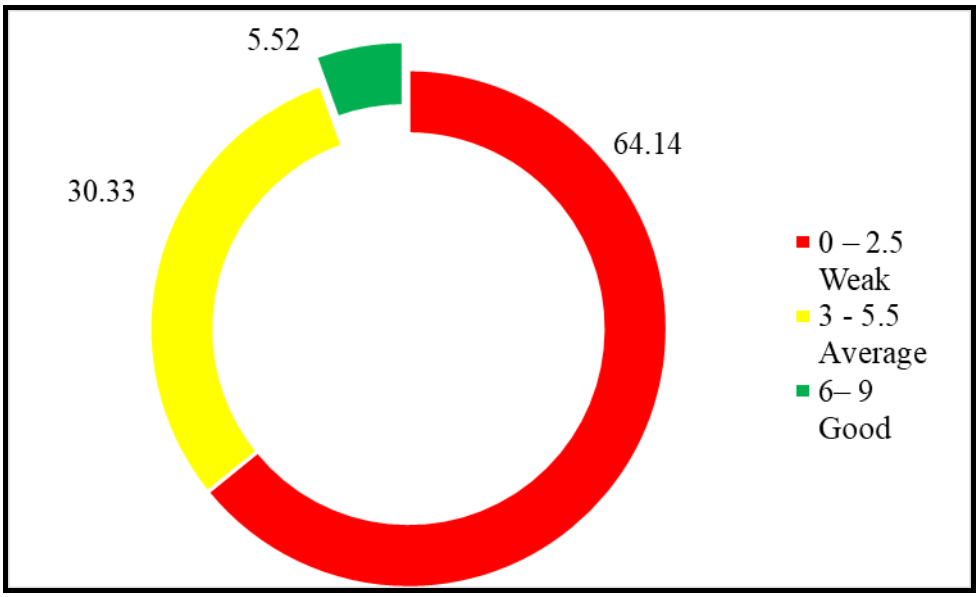


Figure 3: *The percentage of candidates' performance for question 3*

Figure 3 shows that 35.86 percent of the candidates had average performance or above (3 to 9 marks). This means that the performance for this question was average.

Generally, 29,199 (5.52%) candidates who scored higher marks possessed sufficient knowledge and skills in *Map Reading and Map Interpretation.* Additionally, the candidates' responses revealed that they were capable of deducing information from the map. Candidates in part (a) were able to identify the type of rock by providing a justification based on the mapped area. The response in this part was as follows: Given the lowland relief of the mapped area, sedimentary rock dominates, serving as a deposition site for weathered minerals from highland areas. *Over time, the deposited*

materials undergo compaction, cementation, and lithification to form sedimentary rock.

In addition, the candidates in part (b) outlined three characteristics of sedimentary rock: *they occur in layers or strata, consist of rock particles deposited by wind, water, or moving ice, contain fossils, are non-crystalline, can form mechanically, organically, or chemically, and can undergo metamorphism to form metamorphic rock.*

Furthermore, in part (c), they described two possible reasons for the growth of Liwale town. These included *the presence of social services, such as a market, post office, water tank, district headquarters, dispensary, church, and school; the presence of government services, such as district headquarters and administrative services; the presence of network connections of roads (a good transport network); the presence of areas for conducting small-scale cultivation; and the presence of commercial, trade, and economic activities.*

In part (d), the response revealed the candidates' sufficient knowledge and mathematical skills in calculating the distance of a road, by using an RF scale. Those candidates calculated the distance in kilometers from grid reference 814218 to 809165 correctly by following all required procedures, as follows;

(i) Map distance = 11.0 cm - 12.0 cm

(ii) How many centimeters represent 1km?
Since, 1km = 100,000 cm
? Km = 50000cm
2cm = 1km
Therefore, 2cm on a map represents 1km on the ground.

(iii) The distance of a road in kilometers from grid reference 814218 to 809165 is 5.5 km – 6.0 km.

However, their score varied depending on the strengths of their responses. Extract 3.1 demonstrates a sample of a candidate's correct response to this question.

3. a) The dominant type of rock is sedimentary rock because large part of the map is lowland.

b) i) They are formed through sedimentation process

ii) They can undergo metamorphism to form metamorphic rocks

iii) They are stratified rocks

c) i) Presence of social services. Due to presence of Hospitals and schools

ii) Presence of good transport systems. Due to presence of roads

d) Map distance = 11.5cm

Map scale = 1:50,000

Map scale : 1cm represents 0.5km

Soln

From the map scale

1cm = 0.5km

11.5cm = ?

$\frac{11.5\text{cm} \times 0.5\text{km}}{1\text{cm}}$

5.75 km

∴ The distance of the road in kilometers is 5.75 km

Extract 3.1: A sample of correct responses for question 3

On the other hand, the analysis indicates that 160,310 (30.33%) candidates with average performance had insufficient knowledge and skills about the *map reading and interpretation* topic. For example, some candidates in part (a) identified the type of rock correctly, without a reason. In parts (b) and (c), they mentioned a few points out of the required points, while in part

(d), they provided incorrect responses. Conversely, some of them in parts (a) and (b) gave correct responses, whereas in parts (c) and (d), they failed. Moreover, some candidates gave correct responses in parts (a), (b), and (c), mixing up correct and incorrect responses, whereas, in part (d), they provided the correct map distance but failed to convert it into ground distance (km). While other candidates wrote about different types of rocks and characteristics in parts (a) and (b), and in parts (c) and (d), they provided correct responses.

For example, one candidate provided correct responses in parts (a) and (b), but he or she mixed up correct and incorrect responses in parts (b) and (c). In part (b), *crystalline rocks and the cooling of molten materials* were examples of incorrect responses. Moreover, the response indicated the candidate's general knowledge of rocks but failed to distinguish the types and characteristics of each because the points mentioned were the characteristics of igneous rocks. Furthermore, part (c) incorrectly reported the presence of cultural services. Also, part (d) provided the correct map distance but failed to convert it into the ground distance (km). Another candidate identified the dominant type of rock as an *igneous rock* in part (a) and its characteristics in part (b) instead of *sedimentary rock,* while in parts (c) and (d) they provided correct responses. Even though these responses demonstrated the candidate's general understanding of map reading, they did not demonstrate any skills in deducing information from the map.

The candidates who performed poorly (64.14%) showed limited knowledge and skills in the subject matter, as well as in deriving information from the provided map to answer the questions. For example, some candidates provided incorrect responses in all parts. Some of them gave correct responses in part (a), but when responding to parts (b), (c), and (d), they mixed correct and erroneous responses. Other candidates gave responses that were accurate in part (c), whereas in parts (a), (b), and (d), they gave incorrect responses. Furthermore, some candidates provided incorrect responses in parts (a) and (d), whereas in parts (b) and (c), they jumbled up correct and erroneous responses.

For example, in Part (a), one of the candidates wrote metamorphic rock rather than sedimentary rock. He or she mixed up correct and incorrect responses in parts (b) and (c). Examples of incorrect responses in part (b)

were that *the rock can change into other types of rocks*, while in part (c), he or she mentioned *lumbering activities. Furthermore, in part (d), the candidate made a mistake by writing the map distance as 30cm rather than 11.0cm to 12.0cm.* Although the candidate followed the right processes to get the ground distance (kilometres), he or she ended up with the wrong responses. In addition to that, he or she had mathematical skills in finding the distance but lacked skills in measuring distances.

On the other hand, another candidate mistakenly wrote *"igneous rock"* in part (a) instead of "sedimentary rock", along with its associated characteristics (b). In part (c), she or he provided the correct answers, whereas in part (d), he or she provided 20.5 cm as the map distance instead of 11.0 cm to 12.0 cm. Then, he or she followed incorrect procedures to find the ground distance (km). In addition, these responses demonstrated that the candidate possessed limited knowledge of map reading, map interpretation, the ability to measure distances, and the ability to compute ground distances. Extract 3.2 demonstrates candidate's incorrect responses to this question.

3. a) The dominant type of rock in the mapped area Igneous rock.
- Due to the presence of woodland From the grid reference of 760210
- Due to the presence of thick Forest from the grid reference of 750104

b) i) It solidifies and cools. whereby in the igneous rock this occurs due to the existance of different particles in which they solidifies and cools especially due to the existance of different ways.

ii) It is crystallite. whereby in the igneous rock this happens especially due to the presence of different rocks such as granite, Dolerite and other types of rocks that helps its formation.

iii) It is the mother rock since it contains the existance of the other rocks in which may be Formed.

c) i) Climate. whereby in so doing this helps to the growth of Liwale town due to the presence of different conditions involved that help the growth of towns in which they occur in different areas.

ii) Vegetation. whereby in so doing this helps due to the presence of vegetation such as woodland in which it helps in the growth of cities especially due to the existance ways.

Extract 3.2: A sample of incorrect responses for question 3

In Part (a) of Extract 3.2, the candidate named igneous rock as the most common type of rock in the mapped area instead of sedimentary rock. In Part (b), the candidate described the features of igneous rocks instead of sedimentary rocks, and in Part (c), he or she described climate and vegetation instead of briefly describing possible reasons for Liwale town's growth.

2.2.2 QUESTION 4: Introduction to Research

This question tested the candidates' knowledge of the *Research.* It had three parts (a), (b), and (c) in which the candidates were required to read the given statement and then respond to the questions that followed. The statement was that the *school head prefect was assigned to select representatives for research on waste management in their school.*

(a) How is the process used to select the representatives for the research called?

(b) Identify two techniques that will be used to select the representatives named in (a).

(c) Explain three advantages of the process named in (a).

A total of 528,506 (100%) candidates attempted this question. Among them, 338,305 (64.01%) scored from 0 to 2.5 marks, 143,131 (27.08%) scored from 3 to 5.5 marks, and 47,070 (8.91%) scored from 6 to 9 marks. The performance of candidates in this question is illustrated in Figure 4.

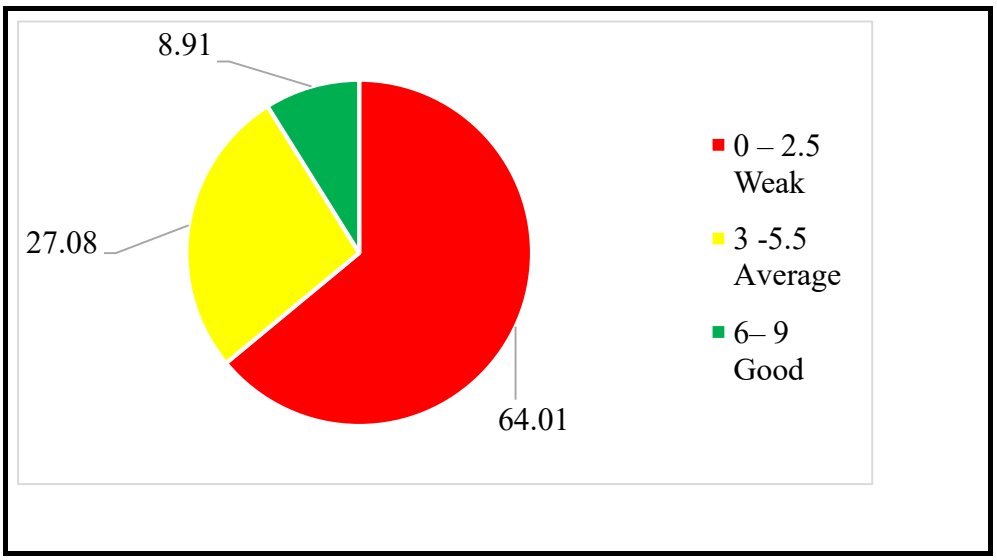


Figure 4: *The percentage of candidates' performance for question 4*

Figure 4 indicates that the general performance on this question was average because only 35.99 percent of the candidates who attempted it scored 3.5 to 9 marks.

The analysis shows that 47,070 (8.91%) candidates who scored high marks revealed sufficient knowledge about the *stages of conducting research*, specifically research design, which consists of research methods and

sampling techniques. As a result, they managed to provide correct responses in all parts. In part (a), they accurately identified the process of representative selection as sampling. In part (b), they identified two techniques that will be used to select the representatives: *(i) probability sampling or random chance (stratified random sampling, simple random sampling, cluster random sampling, systematic random sampling),* and *(ii) non-probability sampling or nonrandom sampling (snowball sampling, purposive sampling, judgmental sampling, accidental sampling, convenience, and quota sampling).*

Moreover, in part (c), they mentioned three advantages of sampling; *it saves time as a researcher does not need to study the whole population*, *it is cost-effective as a researcher may need less funds to be used by the representatives, it helps to save items of the study as researcher do not have to use all of them, it makes data analysis easy, as researcher will have few information from few people, it helps statistical generalization i.e. sample can be used to represent larger population* and *it reduces biases because everyone has equal chance of being selected.* Their scores varied depending on the strengths and clarity of the explanations given. Extract 4.1 presents a sample of correct responses to this question.

4 (a) The process used to select the representatives for the research is sampling

(b) The two techniques that will be used to select the representatives

(i) Probability sampling technique

- In this sampling technique everyone has an equal chance of being chosen as a sample among the population. Probability sampling technique is divided into four types which are simple random sampling, cluster sampling, systematic sampling and stratified sampling technique

(ii) Non-probability sampling technique

- In this sampling technique not everyone can be chosen as a sample for the research. This means that samples are chosen depending on what the research is about, accessibility and what the researcher wants. Non-probability sampling technique is in various types such as consecutive sampling, convenience sampling, judgmental sampling, quota sampling and snowball sampling technique

(c) The following are the advantages of sampling.

(i) Sampling helps to reduce time for conducting research

- This is because the researcher can obtain the information from the samples about the research and does not need to collect data from the whole population

(ii) Sampling helps to reduce biasness

- Information obtained from the whole population can be biased since everyone has his own views but through sampling the information obtained has little or no bias due to presence of few people in providing information.

(iii) Sampling helps to reduce cost.

- The researcher no longer has to incur costs in interrogating the whole population because he/she can obtain information from the samples chosen from the population.

Extract 4.1: A sample of correct responses for question 4

On the other hand, the candidates who scored an average of 143,131 (27.08%) had inadequate knowledge about the concept of *research design*, particularly research methods and sampling techniques. Some candidates provided correct responses in parts (a) and (b), while they wrote incorrect responses in parts (c). Some of them gave incorrect responses in part (a); in part (b), they mixed up correct and incorrect responses, while in part (c), they provided few correct responses. Others gave incorrect responses in parts (a) and (b), whereas in part (c), they wrote correct responses.

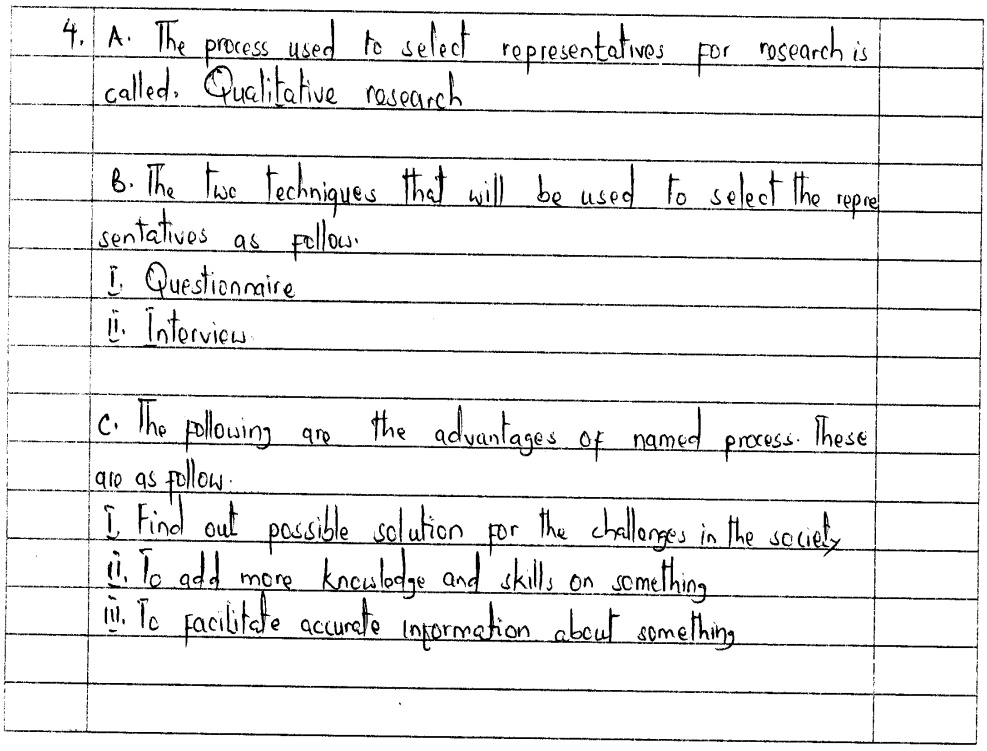
For example, in Part (a), one candidate wrote research instead of *sampling.* In part (b) she or he identified two techniques: *questionnaires and interview methods*, which contrasted with probability sampling or random chance, and non-probability or non-random sampling. In part (c), s/he provided correct responses. Those responses indicated the candidate's general knowledge of the research, but he/she failed to recall the research design, which consists of sampling techniques.

Another candidate provided a correct response in Part (a), but in Part (b), he or she identified two sampling techniques correctly but gave incorrect examples. For instance, they correctly identified two sampling techniques: *probability sampling* (accidental and snowball sampling) and *non-probability sampling* (cluster and systematic sampling). Moreover, the candidate provided correct responses in part (c). The candidate failed to realise that *accidental* and *snowball sampling* are examples of *non-probability,* while *cluster* and *systematic sampling* are examples of *probability sampling*. Those responses showed the candidate's general knowledge of the research design, which consists of sampling techniques, but failed to distinguish them clearly.

A total of 338,305 (64.01%) candidates scored low marks due to having little knowledge of the subject matter. Their responses revealed candidates' limited knowledge of a *research design,* which consists of research methods and sample selection methods. For example, some candidates provided incorrect responses in all parts. Some wrote correct responses in parts (a), while others provided incorrect responses in parts (b) and (c). In parts (a) and (b), some provided incorrect responses, while in parts (c), they mixed up correct and incorrect responses. Others provided incorrect responses in parts (a) and (b), while in part (c), they provided only one correct response out of the required points.

For instance, in part (a), a candidate identified the representative selection process as *simple random sampling*, rather than *sampling*. In part (b), she or he named two techniques, such as *interviews* and *literature reviews,* instead of *probability* and *non-probability sampling*. Part (c) elucidated the correct and incorrect benefits of sampling, demonstrating the development of *skills for observing, recording errors, and highlighting the suitability of the method for a small population*. Those responses demonstrated the candidate's understanding of research, but she or he lacked specific knowledge of the research design, which consists of research methods and sampling techniques. A *simple random sampling* is an example of probability sampling. The observation method develops *skills for observing and recording,* and *it is good for a small population*. Interviews and *literature reviews* are the tools for collecting data.

In part (a), another candidate named the process *observation i*nstead of *sampling.* In part (b), he or she mentioned two techniques, such as *direct* and *indirect observation*, while in part (c), he or she provided only one correct response. The responses demonstrated the candidate's understanding of the concept of research, yet they overlooked the fact that *observation* serves as a data collection tool, and that *direct and indirect observation* are types of observation, not techniques for selecting research representatives. Extract 4.2 represents a sample of incorrect responses.



Extract 4.2 A sample of incorrect responses for question 4

In Extract 4.2 the candidate mentioned qualitative research as the type of process used to select representatives instead of sampling in (b), identified questionnaire and interview as the suitable types of process mentioned in (a) and in (c) explained the advantages of research work instead of advantages of sampling.

2.2.3 QUESTION 5: Elementary Survey and Map Making

The question consisted of parts (a), (b), and (c) whereby the candidates were required to read the scenario provided and then respond to the questions that followed. The statement given was; *You have been assigned to measure a linear distance between lines of traverse in measuring a new plot for a school playing ground*

(a) Suggest a suitable survey method for the activity.

(b) Mention the first and the last steps that you will use to accomplish the activity.

(c) Briefly explain three survey equipment you will use in the field.

A total of 528,506 (100%) candidates attempted this question. Among them 143,970 (27.24%) scored from 00 to 2.5 marks, 191,969(36.32%) scored from 3 to 5.5 marks and 192,567 (36.44%) scored from 7 to 9 marks. Figure 5 illustrates the candidates' performance in this question.

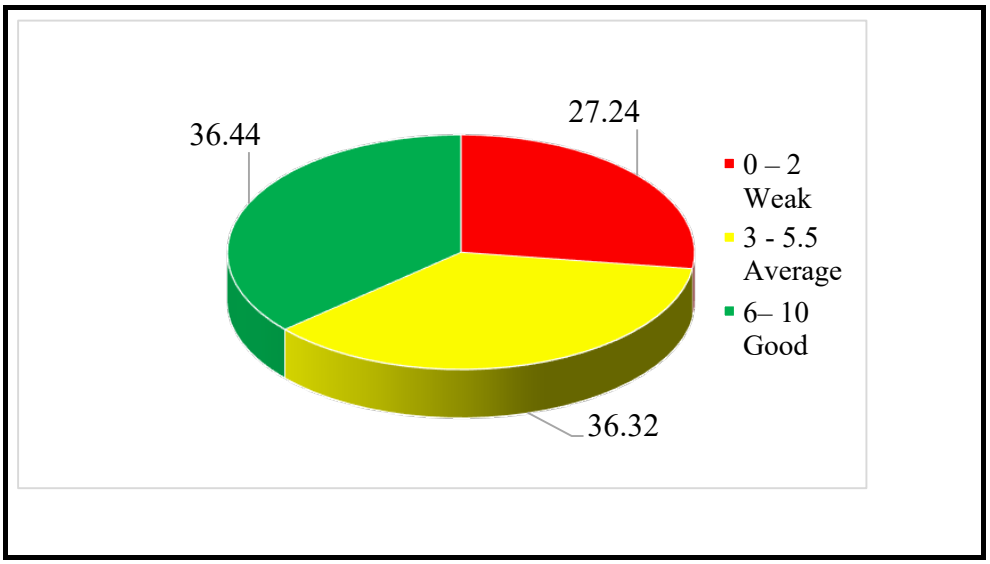


Figure 5: *The percentage of candidates' performance for question 5*

Figure 5 indicates that the general performance on this question was good because 72.76 percent of the candidates who attempted this question scored 3.5 to 09 marks.

The analysis revealed that 192,567 (36.44%) candidates with good performance had adequate knowledge about *elementary surveying and map making*, particularly the chain survey or tape survey. Those candidates in part (a) suggested a suitable survey method, such as a *chain or tape survey.* In part (b), they mentioned the first and last steps of the chain survey, which were: (i) *inspection of the area, reconnaissance, pre-survey, pre-visit,* and *(ii) report presentation, report writing, and data presentation.* In part (c), they explained the three survey equipment items that the field will employ:

> *Chain is a tempered steel wire of 20m to 30m long, it is connected by small rings at equal intervals. A ranging pole is a wooden or metal pole that is 2.5m or 3.5 m long. It has a sharp point at one end for easy driving into the ground. It is used to mark the station temporarily. A peg is a wooden or metal-made pole or cement block of 40mm square*

to 50cm or 70cm thick. It is used for marking permanent points on the ground. Also, they explained that a tape measure is a fiberglass-made tape of 50cm to 100cm long. It is extended from the inside of the cable to the required length. It is graduated in inches, feet, centimetres, metres, or feet at equal intervals. Cross staff refers to the metal or wooden-made staff of 2.5 to 3m long with a cross at its top. The crosses are made at a right angle to each other; they are used to measure the right angles between lines of traverse.

Additionally, *arrows are the steel skewers of iron rolled and bent into a piece of metal; sometimes they are tied by a coloured rag to be easily seen from a distance. They are used to show points on the ground or show the direction of the chain over tall grasses during chaining,* and *a notebook and pencil are the equipment for keeping or recording the information from the field during surveying. The notebook should be a spiral-bound notebook, and the pencil should be thick and well-sharpened and used for writing, sketching, booking, and mapping.* However, their score varies depending on the strength of their responses. 5.1 represents a sample of such good responses to this question.

5

a. Chain survey

Is the type of survey method which involves taking the linear measurement from the land.

b.

i. Pre-survey as the first step.

Is the pre-visiting of an area before doing surveying to an area as it helps to be familiar with an area that is being investigated

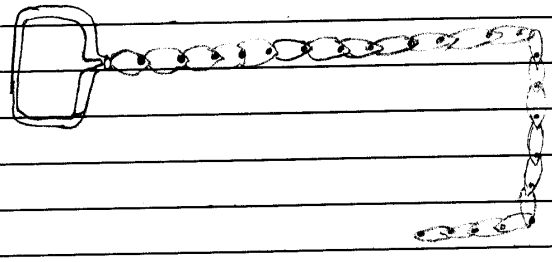
ii. Report writting

Is the writting about the information taken during conducting surveying as this it helps to know the general measurement of an area.

5 C.

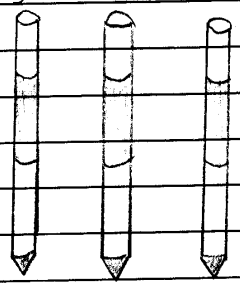
i. CHAIN.

Is the instrument that is used for taking linear measurement to the ground



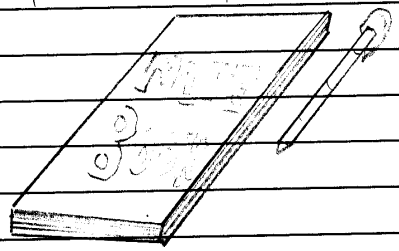
ii. RANGING POLES.

Is the instrument that is used for temporary marking the station during surveying.



iii. NOTEBOOK AND PENCIL.

Is the instrument that is used for recording the information of the surveying



Extract 5.1: A sample of correct responses for question 5

Conversely, 191,969 (36.32%) candidates with average scores had moderate knowledge of the concept of elementary survey and map making, especially on the chain survey, steps, and equipment used. For example, some candidates provided correct responses in parts (a) and (b), while others provided incorrect responses in part (c). Some of them provided correct responses in part (a), while others in part (b) provided incorrect responses and a few correct points in part (c). Others provided correct responses in parts (a), (b), and (c), but they mixed up correct and incorrect responses.

For example, one candidate correctly suggested a suitable survey method in part (a). In parts (b) and (c), he or she mixed up correct and incorrect responses. In part (b), *observation* and *measurement* were examples of incorrect responses, while in part (c), *plumb bob and alidade* were incorrect. These responses showed the candidate's general knowledge of elementary surveying. As a result, they failed to recall that *observation and measurement* are the second procedure in chain survey, while *plumb bob and alidade* are the equipment in plane table survey.

Another candidate named the correct survey method in part (a), whereas in part (b), he or she mentioned setting the right angle and taking measurements at the right angle. Moreover, he or she explained a few correct responses. This candidate failed to recognise that setting the right angle and taking measurements at the right angle are the methods of establishing and setting the right angle during chain surveying. He or she also correctly mentioned a few survey equipment. Therefore, these responses demonstrated the candidate's general knowledge of the subject matter.

A total of 143,970 (27.24%) candidates who scored low marks had little knowledge of the subject matter. For example, some candidates provided incorrect responses in all parts (a), (b), and (c). Other candidates gave correct responses in parts (a), (b), and (c), while some provided incorrect responses in parts (a), (b), and (c). For example, one candidate wrote a suitable survey method as a levelling *survey* instead of a chain *survey* in part (a). In part (b), he or she mentioned methods such as the rise *and fall method* as well as the height *of collimation method*. Furthermore, in part (c), she or he gave a few correct responses. The candidate had a general understanding of the concept of a survey but failed to distinguish between

different types of surveys. The *rise and fall method and the height of collimation method* are two methods of levelling, which determine the height of points on the earth's surface.

Another candidate in part (a) described a prismatic survey rather than a chain survey. In part (b), he or she mentioned *forward bearing* and *backward bearing,* with few correct responses in part (c). This candidate failed to identify that a *prismatic survey* involves setting an object's position in the field by measuring the angle of bearings between the magnetic line (0^0) and the line of sight to the object. Whereas *forward bearing* and *backward bearing* are the processes involved in a prismatic survey. These responses revealed the candidate's limited knowledge of the survey method for measuring a linear distance between lines of traverse. Extract 5.2 illustrates weak responses from one of the candidates.

05 a). The suitable survey method that is to be used for the activity is Levelling method that involves the introducing of linear transverse lines in the areas.

b)- The first step in activity of the plot levelling is by marking and constructing the actual plot area that is to be levelled in that specific area by putting the marks by the available equipments.

- The last steps are:

i) Make sure that the area of the plot is clear and equal in all positions so as to get accurate measurement

ii). Measure and record the measurements that you will get after constructing a line of transverse between the plotted area from one angle to another.

c). The three survey equipment which are going to be used are

i) Levelling staff: this is the equipment that is used to to measure a linear distance between lines of transverse in the area that is to be levelled. by putting marks in some of the points

ii) Spirit level: also a spirit level is used to construct the equal transverse lines by ensuring that the area that was extended or increased is being levelled by being decreased to a specific height.

iii). A rope is used to put a boundary at which an area is to be surveyed it also marks the area plotted that is to be surveyed upon.

Extract 5.2: An example of incorrect responses to question 5

In Extract 5.2, the candidate suggested levelling as a suitable survey method for the activity instead of a chain survey. In (b), he/she mentioned marking and constructing the plot instead of mentioning inspection of the area, reconnaissance, the pre-surveyor pre-visit, and report

presentation/report writing as the first and last steps that will be used to accomplish the surveying. In (c), he/she described levelling staff, spirit level, and rope instead of three survey equipments to use in the field, such as chain, ranging pole, peg tape measure, cross staff, arrow, and notebook.

2.2.4 QUESTION 6: Photograph Reading and Interpretation

This question tested the candidate's understanding of the concept of the *Photograph Reading and Interpretation.* It had three parts (a), (b), and (c) in which the candidates were required to study carefully the given photograph and then answer the questions that followed.

(a) With two reasons, suggest the type of photograph.

(b) Mention the depositional, erosional, and man-made features seen in the photograph. Give two features for each.

(c) Describe three stages of formation of the main marine erosion feature seen in the southeastern part of the foreground.

A total of 528,506 (100%) candidates attempted this question. Among them, 370,346 (70.07%) scored from 00 to 2.5 marks, 153,871 (29.11%) scored from 3 to 5.5 marks, and 4,289 (0.81%) scored from 9 marks. Figure 6 illustrates the candidates' performance in this question.

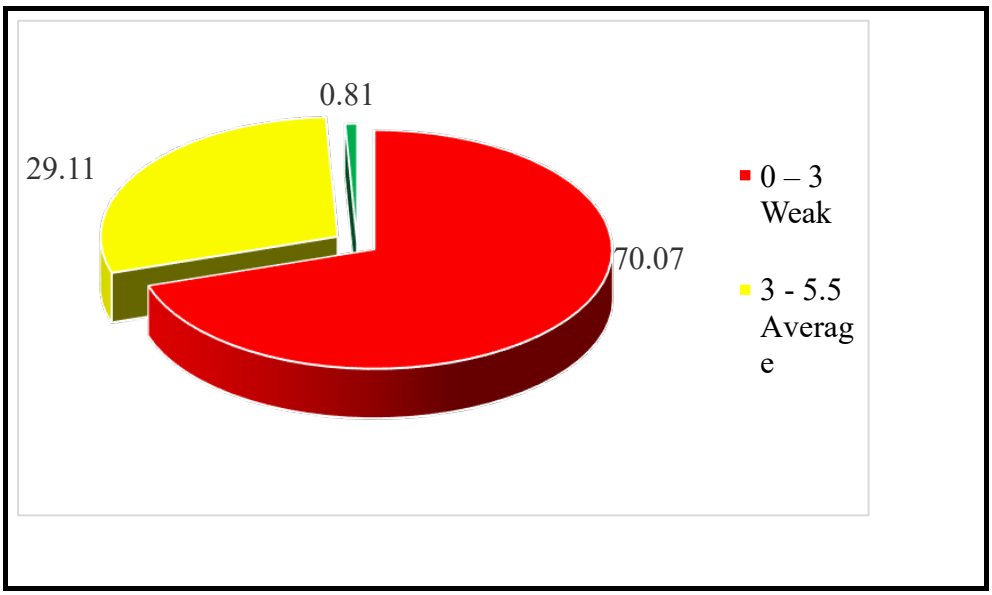


Figure 6: *The percentage of candidates' performance for question 5*

Figure 6 indicates that the general performance on this question was poor because 29.93 percent of the candidates who attempted it scored 3.5 to 9 marks.

The analysis shows that 4,289 (0.81%) of candidates had high performance. Their responses revealed adequate knowledge of the *Photograph Reading and Interpretation* topic because they demonstrated the ability to recognise general information portrayed in a photograph; hence, they managed to correctly identify the type of photograph and the natural and man-made features seen in the photograph. Also, they demonstrated the ability and skills to observe, analyse, and interpret the photograph effectively. Thus, in part (a), they managed to suggest the type of photograph as a low-*oblique photograph,* for the reason that *it covers a large area* and *shows a horizon clearly*. Likewise, in part (b), they mentioned the depositional, erosional, and man-made features seen in the photograph, with two examples for each, such as *deposition features* (beaches, spit, sand bar, tombolo mudflats), *erosional features* (cave, stuck or stump, bay, and headland), *and man-made features* (buildings, vehicles, and communication towers).
On top of that, in part (c), they described three stages of marine erosional features seen in the photograph at the south-eastern part as follows: *(i) the development of caves on either side of the headland or opposite to each other's; (ii) the joining of the two opposite caves by marine erosion to form an arch;* and *(iii) the collapsing of an arch to the end of the headland as a stack*. However, their score varies depending on the strength of their responses. Extract 6.1 is a sample of the correct response from one of the candidates who performed well in this question.

6. (a) The type of photograph given is an oblique photograph; this is because

(i) The objects shown are seen from their side view and upper part.

(ii) The horizon are seen

(b) The following are some features that are seen on the photograph;

- Depositional features

i) Beaches

ii) coral reef

- Erosional features.

i) Cave

(ii) Stump and stack

- man made feature.

(i) Buildings.

(ii) Cars.

(c) The following are stages of formation of the main marine erosion feature seen at south eastern part of the foreground.

(i) Water action on headland to form a hole.

- Through erosion, water action leads to the formation of a natural arch on the headland.

(ii) Frequent erosion on the arch causes it to become smaller.

- More wave erosion causes the arch to reduce and become more narrower or smaller.

(iii) The arch falls off and finally forms a stump or stack.

- The natural arch finally falls off and thus forms a stack or stump on the ocean, as seen on the photograph.

Extract 6.1: A sample of correct responses for question 6

On the other hand, 153,871 (29.11%) candidates with moderate performance were aware of *photograph reading and interpretation*, but they indicated inadequate ability and skills necessary to observe and interpret photographs. For example, in part (a), some candidates mentioned the correct type of photograph without providing any justification. In parts (b) and (c), they mixed up correct and incorrect responses. Some of them correctly identified the type of photograph, with reasons in part (a). In part (b), they correctly mentioned the depositional, erosional, and man-made features without providing any examples, whereas in part (c), they failed to describe the three stages of the formation of the *stack* while others wrote the correct response, though they mixed up reasons in part (a), while in part (b), they provided only one example, and in part (c), they provided incorrect responses.

For example, in part (a), one candidate suggested the correct type of photograph without justification. In parts (b) and (c), he or she mixed up correct and incorrect responses. In part (b), examples of incorrect responses include *cliffs* as depositional features and t*ombolo* as erosional features. In part (c), incorrect responses included *strong swash, weak backwash*, and *gently sloping shore*. These responses indicated that the candidates had a general understanding of the concept of wave action but lacked specific knowledge to differentiate various features and modes of formation from wave action. Cliffs emerge from wave erosion, while a tombolo is a result of deposition. Apart from that, strong swash, weak backwash, and a gently sloping shore are the conditions required for beach formation.

Another candidate in part (a) correctly wrote the type of photograph but mixed up correct and incorrect reasons for such a photograph. An example of an incorrect reason is that *it was taken at about* 180^0. In part (b), she or he provided only one example for each, whereas in part (c), she or he gave incorrect responses. This candidate had general knowledge of the subject matter. He or she lacked specific knowledge of the types and characteristics of the photographs. Thus, she or he failed to remember that the given reason pertains to *a horizontal photograph, not a low-oblique* one.

In contrast, 370,346 (70.07%) candidates with weak performance had limited knowledge on the subject matter. The responses indicated the candidates' inability to observe and interpret photographs. For example, in part (a), some candidates correctly suggested the type of photograph

without giving reasons. In part (b), they failed to mention any depositional, erosional, or man-made features seen in the photograph. Similarly, they failed to explain the three stages of formation of the primary marine erosion features visible in the south-eastern foreground of part (c). Some of them, in part (a), named the incorrect type of photograph, but they gave incorrect reasons. In part (b), they mixed up correct and incorrect responses, and in part (c), they provided incorrect responses while others provided incorrect responses in all parts (a), (b), and (c).

For example, one candidate in part (a) suggested the type of photograph *as a vertical photograph rather than a low-oblique photograph.* The candidate cited the *clear visibility of the top view and its wider coverage* compared to *horizontal and oblique photographs*. In addition to that, in part (b), they mixed up correct and incorrect features. The incorrect features were *Geo as a depositional feature* and *Beach as an erosional feature.* These responses demonstrated the candidate's general understanding of the concept of a photograph, but he had little knowledge of the types and characteristics of the photographs because the reasons given were the characteristics of the *vertical photograph*. Apart from that, he or she had little understanding of the features produced by wave erosion and deposition, since *geo* is the erosional feature and *beach* is the depositional feature. Extract 6.2 shows a sample of incorrect responses to this question.

06

a) Type : Ground photograph.

Reasons : i. It shows the fronts view

ii. The height of the Object is seen clearly

b) Depositional.

- Water (Ocean)
- Ocean land

Erosional

- Land
- forest

Man made

- Land
- Water

C) i. Hydraulic Action, is one of the stage of the Marine erosion. and this it occurs due to the breath of ocean formed which led to destruction and leads to Marine erosion.

ii. Attrition, is one of the stage of marine erosion. and this it occurs due to depth of the ocean formed till makes the marine erosion.

iii. Abrassion, is one of the stage of marine erosion. and it occurs due to length of Ocean formed which led to destruction and leads to Marine erosion.

Extract 6.2: A sample of incorrect responses for question 6

In Extract 6.2, the candidate provided wrong responses, in (a) suggesting oblique photography as a type of photograph instead of high oblique photograph with reasons (b) mentioned ocean and water as deposition features instead of beaches, Land, and forest instead of Erosion features such as caves, stack or stump, bay or headlands and land and water instead of man-made features such as buildings, communication towers, roads, and trees. In part (c), he or she explained the processes of river erosion instead of describing three processes of stack formation.

2.2.5 QUESTION 7: Forces that Affect the Earth

This question evaluated the candidates' understanding of the concept of *Forces that affect the Earth*. It had two parts (a) and (b), in which the candidates were required to read the given statement and then respond to the questions that followed. The statement was:

The Form Four students watched a video showing a landscape of Switzerland and noticed several features developed by ice action.

(a) Briefly describe four highland erosional features observed by the students.

(b) Draw a well-labeled diagram showing features described in (a).

A total of 528,506 (100%) candidates attempted this question. Among them, 506,572 (95.85%) scored from 0 to 2.5 marks, 12,720 (2.41%) scored from 3 to 5.5 marks, and 9214 (1.74%) scored from 6 to 9 marks. Figure 7 illustrates the candidates' performance in this question.

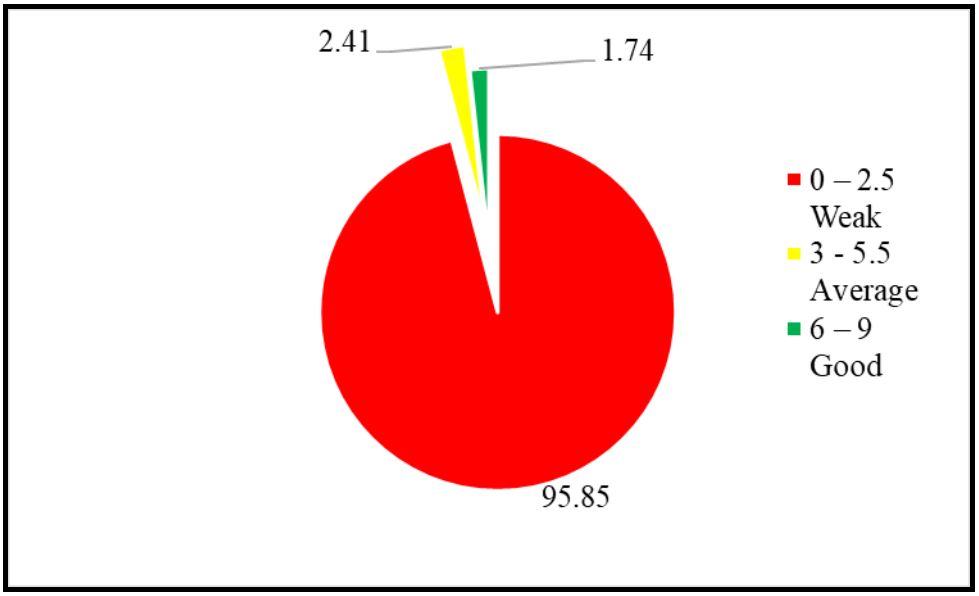


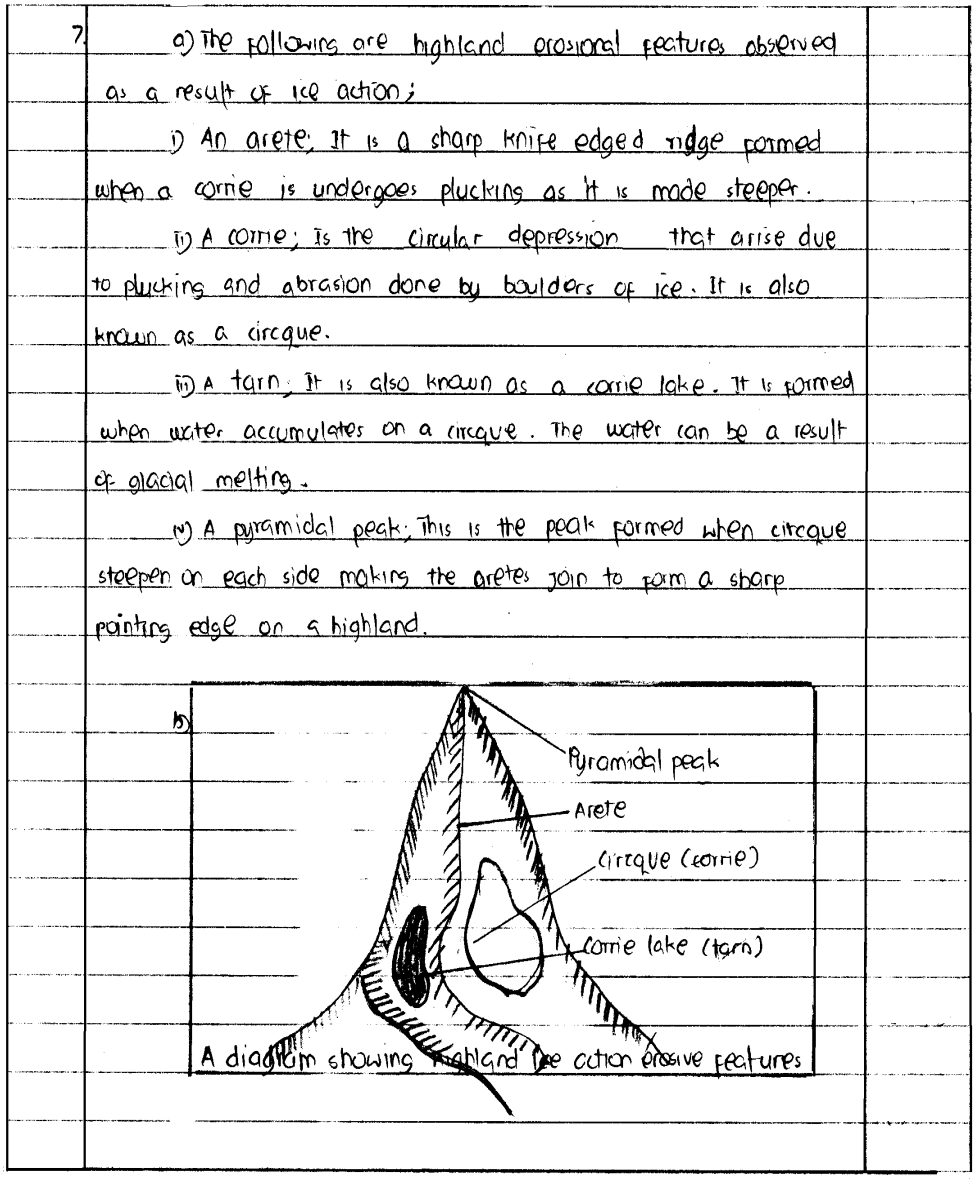
Figure 7: *The percentage of candidates' performance for question 7*

Figure 7 indicates that the general performance on this question was poor because only 4.15 percent of the candidates who attempted this question scored 3.5 to 09 marks.

The analysis shows that 9,214 (1.74%) candidates who scored high marks had sufficient knowledge on the topic of the *Forces That Affect the Earth*, specifically the external forces and the action of ice in creating features produced by the erosive power in highland glacial areas. As a result, in part (a), they were able to describe four highland erosion features that they had observed, such as: *A cirque, or corrie, is a steep-sided, semi-circular basin-shaped on the sides of a mountain by a glacier. Plucking on the basin's back walls steepens it, whereas abrasion on the floor deepens it. Water can occasionally fill a cirque, creating a corrie or cirque lake. An arête is a steep, knife-edged ridge separating the two cirques or corries in a glaciated highland area. Plucking the back of the cirque forms the arête. Frost action cuts and deepens the sides of the cirques or corries, forming a sharp peak known as a pyramidal peak.*

They also explained that the vertical and lateral erosion of the moving ice produces a U-shaped valley, which has steep sides and a flat floor. The tributary glacier forms the Hanging Valley, a smaller side valley that hangs above the main u-shaped valley. *Truncated spurs, also known as spurs, are landforms found in glaciated areas that have been shaped by glacial erosion. Glacial activity forms a glacial lake, a body of water that forms*

when a glacier erodes the land, melts, and fills the depression. On the other hand, in part (b), the candidates demonstrated the ability to portray good drawing and labelling skills, as they managed to draw a well-labelled diagram showing features described in (a) as follows: However, their scores differed due to the strengths of their responses. Extract 7.1 demonstrates a sample of such good responses.



Extract 7.1: A sample of correct responses for question 7

A total of 12,720 (2.41%) candidates who scored average had insufficient knowledge about the *Forces That Affect The Earth's Surface*, specifically

the highland's glacial erosional features. Similarly, they had poor drawing abilities and skills. For example, in part (a), some candidates mentioned correct points but mixed up some wrong descriptions, while in part (b), they drew a diagram with correct labelling. Some of them mixed up correct and incorrect features in Part (a), and in Part (b), they drew a diagram to show those features (correct and incorrect). On the other hand, others failed to provide correct responses in part (a), whereas in part (b), they drew and labelled a diagram correctly.

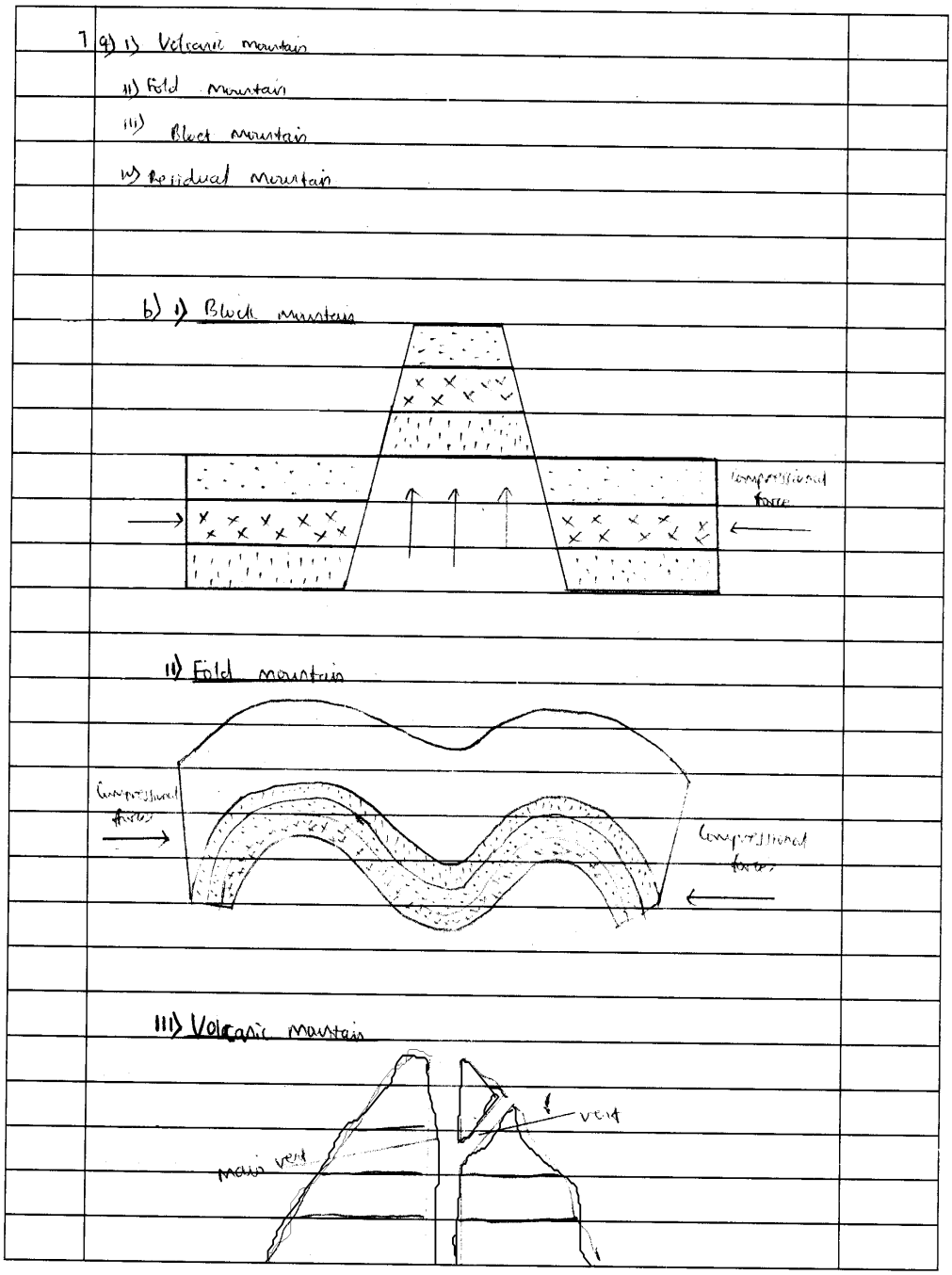
For example, one candidate in Part (a) mixed up correct and incorrect features and drew a diagram to show those features (correct and incorrect) in Part (b). The *crag, tail, and moraine* were examples of incorrect features. These responses revealed the candidates' general knowledge of the action of ice on the Earth's surface but failed to identify specifically the features of glacial erosion in the highlands and the lowlands. *The features of glacial erosion in the lowlands include crag and tail, as well as moraine.*

Another candidate mentioned correct features in part (a), but mixed up descriptions of those features, while in part (b), s/he drew a diagram with correct labelling. Examples of features with incorrect descriptions were a *U-shaped valley* and *an arête*. He or she described an arête as a steep-sided valley with a flat floor, resulting from the vertical and lateral erosion of the moving ice. While a *U-shaped valley is a steep, knife-edged ridge separating the two cirques or corries in a glaciated highland area,* These responses showed the candidates' general understanding of the landscape features resulting from the action of ice, but they failed to remember descriptions of all features. Since the descriptions made for a U-shaped valley were for *an arête*, an arête was for a U-*shaped valley*.

A total of 506,572 (95.85%) candidates with weak performance demonstrated inadequate knowledge of the forces that affect the earth, particularly highland glacial erosional features. In addition to that, they demonstrated limited skills in drawing. For example, some candidates provided incorrect responses in all parts (a) and (b) by naming relief features that contradicted the question's demand. Some of them in part (a) mentioned a few features without descriptions, and in part (b), they drew a diagram with few correct features, while others provided only one correct feature in part (a) and drew a diagram to show such a feature in part (b).

For example, in Part (a), one candidate mentioned highland erosional features such as *zeugens, yardangs*, and *eskers*. While in Part (b), I failed to draw a diagram. This candidate had little knowledge of features resulting

from the ice action on the Earth's crust because only *eskers* are glacial depositional features, while *zeugens* and *yardangs* are resultant features of wind erosion. Another candidate provided only one correct feature in part (a) and drew a diagram to show such a feature in part (b). The candidate correctly identified the *pyramid peak or horn* as the correct feature in parts (a) and (b). The candidate's lack of understanding of the subject matter led him to make such responses. Extract 7.2 illustrates a sample of such incorrect responses.



Extract 7.2: A sample of incorrect responses for question 7

In extract 7.2, part (a), the candidate didn't describe about the four highland erosional features that the students saw, which were arête, pyramidal peak, hanging valley, u-shaped valley, and corrie. Instead, they mentioned about types of mountains, such as volcanic, fold, block, and residual mountains.

In part (b), the candidate drew diagrams of the block, volcanic, and fold mountains instead of a well-labelled diagram showing the features described in (a).

2.2.6 QUESTION 8: Climate and Natural Regions

This question assessed the candidates' understanding of the concepts of *Climate and Natural Regions.* It had two parts (a) and (b), in which the candidates were required to respond to the questions that followed.

(a) How does vegetation adapt to the environment in desert areas? Give five points.
(b) Explain four characteristics of vegetation found in desert areas.

A total of 528,506 (100%) candidates attempted this question. Among them, 417,591 (79.01%) scored from 00 to 2.5 marks, 68,445 (12.95%) scored from 3 to 6.5 marks, and 42,470 (8.04%) scored from 7 to 9 marks. Figure 8 illustrates the candidates' performance in this question.

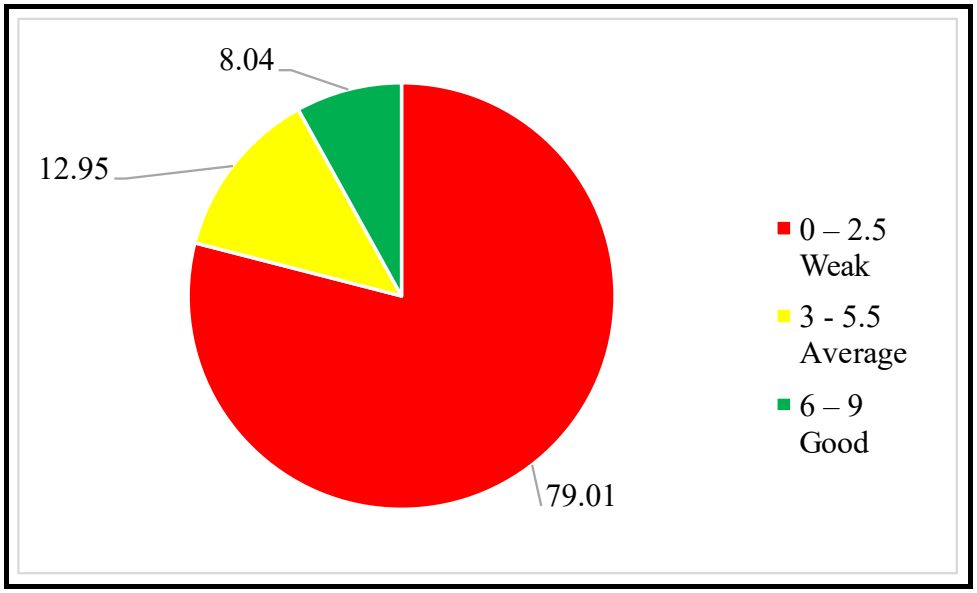
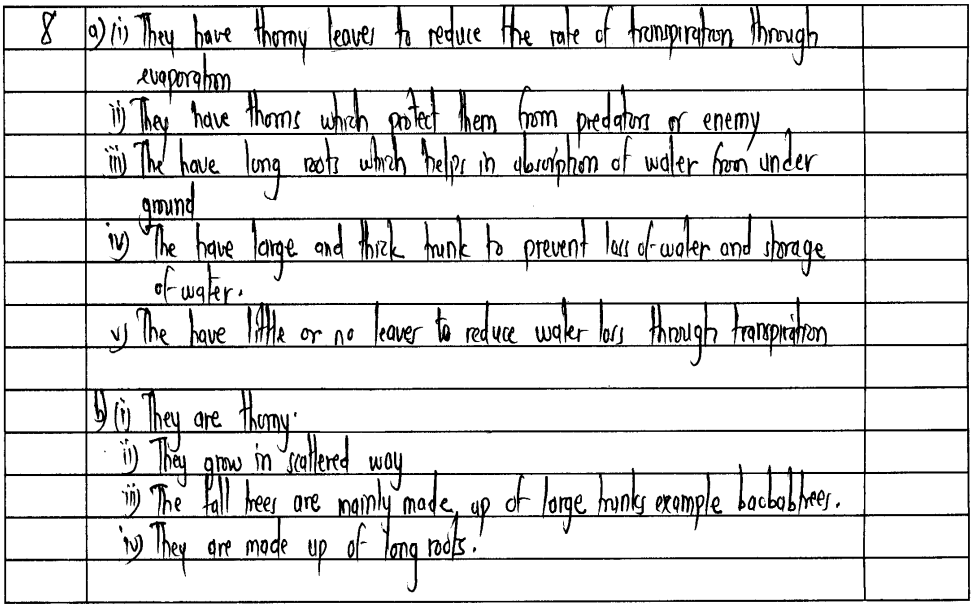


Figure 8: *The percentage of candidates' performance for question 8*

Figure 8 indicates that the general performance on this question was poor because only 20.99 percent of the candidates who attempted it scored 3.5 to 99 marks.

Overall, 42,470 (8.04%) candidates had a good performance on this question. Their responses revealed the candidates' adequate knowledge of the concept of climate *and natural regions*, particularly the climatic characteristics of desert areas. For example, some candidates in Part (a) explained how vegetation in desert areas adapts to the environment as follows: *Shed leaves during the dry seasons to reduce the rate of water requirement, have long roots to tape water under the ground, have a hard surface like nylon which cover to reduce the evapotranspiration process, have thorn and waxy leaves to prevent from being eaten by animals, tends to form a crown shape during the dry seasons to avoid excessive evaporation of water under the roots and stem, have specialized organ for storing water e.g. cacti*, *most of the plant's seeds remain dormant for years before rainfall condition, store water in leaves, stems or roots nodules to reduce the transpiration, they have sunken stomata to reduce loss of water through evaporation.*

Additionally, in part (b), they outlined four characteristics of the vegetation in the desert area, including the fact that *most of the trees are deciduous, have thin, waxy leaves, are salt-tolerant due to the saline soil in the desert, have long roots that can carry water deep into the ground, are xerophytes, or trees that survive in harsh, dry conditions, consist of thorny bushes, have a scant, scattered distribution of vegetation, and have sunken stomata*. Their scores varied depending on how strong their responses were. Extract 8.1 shows a sample of the correct responses to this question.



Extract 8.1: A sample of correct responses for question 8

On the other hand, 68,445 (12.95%) candidates who had moderate performance were aware of the concept of climate *and natural regions* but failed to recall how vegetation adapts to the environment in desert areas. For example, some candidates provided a few points in parts (a) and (b). Some of them mixed up correct and incorrect points in parts (a) and (b), while others provided correct responses either in part (a) or part (b) only. For example, one candidate wrote the following incorrect response in part (a): Some *trees store water in their trunks*. The candidates failed to recall that this is the way vegetation adapts to the environment in tropical climate regions and not in desert areas. Another example of incorrect responses in part (b) was that *the grass tends to turn brownish during the dry season*, *other trees develop an umbrella,* and *vegetation is characterised by grasslands*. The candidate overlooked the fact that these traits are specific to vegetation in tropical climate zones, not desert regions. Therefore, those responses indicated the candidate's general knowledge of the concept of natural climate regions but failed to identify specific types of world climate and their characteristics.

In contrast, 417,591 (79.01%) candidates with weak performance had little knowledge on the subject matter. They failed to provide correct responses due to a limited understanding of the climatic characteristics of the desert areas. For example, some candidates provided incorrect responses in parts (a) and (b) by explaining the importance of vegetation. Some of them

responded to only one part (a) or part (b), while others mixed up correct and incorrect responses in parts (a) and (b).

For example, one candidate responded to part (b) only but mixed up correct and incorrect responses. Incorrect responses in this part included the fact that the *conifers are evergreen and the vegetation has shallow roots to absorb surface moisture*. The candidate overlooked the fact that the vegetation in the cool temperate continental climate region (Siberian type) possesses these characteristics. Hence, the candidate's responses revealed a lack of specific understanding of the types of world climates and their characteristics. Extract 8.2 demonstrated a sample of incorrect performance for this question.

8. (a) (i) Presence of rainfall. This means when there will be many presence of plants in desert areas there will be heavy rainfall due to the formation of evaporation.

(ii) Provide good habitat to living organisms. This means they can provide a fresh air because in desert there is hot climatic condition so if there will be enough vegetation they can get a fresh air coming from trees.

(iii) Provide natural medicine. This means some trees are the source of natural medicines like there leaves or roots of ~~the~~ tree or bark of the trees and can be able to treat many diseases.

(iv) Provide good climatic conditions. This means when they planted many trees there will be enough air and good at all so that to reduce the hot climatic condition in the desert area.

(v) Provide fruits for living organisms. This means when planting trees there should be a good trees which can help to provide good fruits like Mango trees Oranges trees and so on.

8. (b) (i) There will be heavy rains. Due to the presence of planting many trees

(ii) There will be good climatic condition. Due to the fresh air which they can get on the presence of trees found in the area.

(iii) There will be good fertile soil. Because when you plant tree you can help to reduce soil erosions in the area.

(iv) There will be habitat to living organisms. Because when you plant enough trees there will be the places of birds and others

Extract 8.2: A sample of incorrect responses for question 8

In extract 8.2, the candidate identified the importance of forests in part (a) instead of explaining the factors of how plants adapt to the environment in desert areas. In part (b) He/she described the advantages of planting trees instead of explaining four characteristics of vegetation found in desert areas.

2.3 SECTION C: ESSAY QUESTIONS

This section consisted of three essay questions, whereby the candidates were instructed to answer only two questions, which carried 15 marks each, making a total of 30 marks.

2.3.1 QUESTION 9: Weather

The candidates were tested on the concept of *Weather*. They were required to read the given statement and answer the question that followed. The statement was; *Juma was travelling from Iringa to Dar es Salaam. On his way, he experienced a gradual increase in temperature. In six points, analyse the causes of such a situation.*

A total of 321,734 candidates opted for this question. Among them, 26,387 (82.80%) scored from 0 to 4 marks, 39,237 (12.20%) scored from 4.5 to 9.5 marks, and 16,110 (5.01%) scored from 10 to 15 marks. Figure 9 illustrates the candidates' performance in this question.

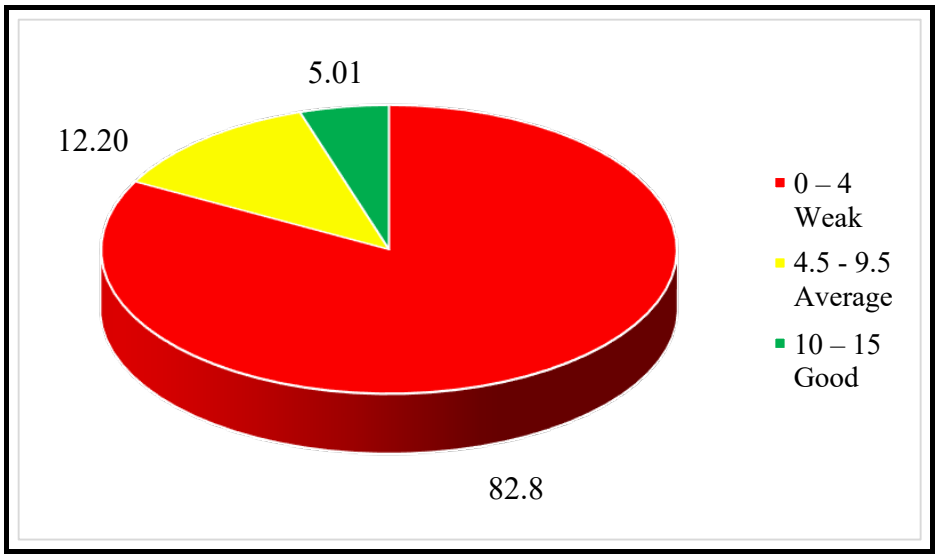


Figure 9: *The percentage of candidates' performance for question 9*

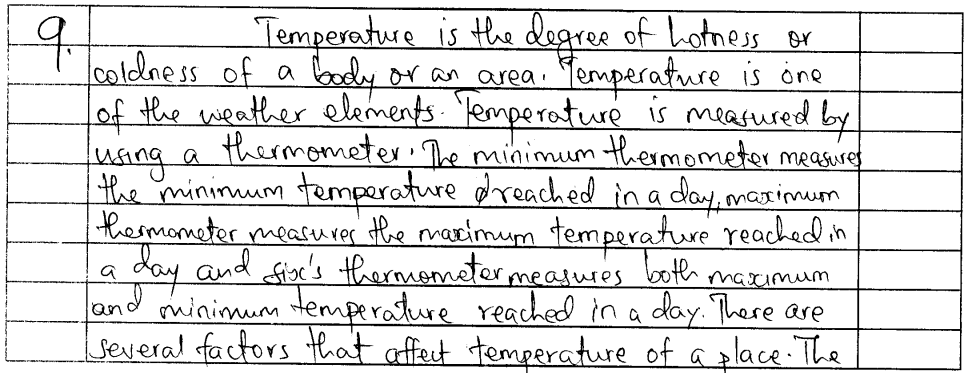
Figure 9 indicates that the general performance on this question was poor because only 17.21 percent of the candidates who attempted it scored 4.5 to 15 marks.

Generally, 16,110 (5.01%) candidates with high marks had sufficient knowledge of the concept of *weather*, specifically of the elements of weather. They were able to identify factors that affect the temperature of an area. Good understanding enabled them to provide the correct responses. Those candidates provided a relevant introduction, main body, and conclusion. They provided a relevant introduction, as follows: Temperature refers to an area's degree of hotness or coldness. *Temperature variation is a result of differences in altitude; the higher you go, the cooler it becomes. Thus, different areas with different altitudes will experience different temperatures.*

Moreover, they analysed factors affecting the temperature of an area such as; *Latitudinal position, areas located at the equator or low latitude assume hot temperature due to the amount of solar energy that hits directly from the sun, areas located at the poles tend to assume low temperature due to the angle of the exposure of the sun energy to reach the land. The distance*

from water bodies, also known as continentality, influences the temperature of nearby areas, such as lakeshore zones and coastal areas, by influencing the amount of humidity. Areas distant from water bodies typically experience a cooler temperature due to the cooling effect of humid conditions. Examples of areas affected by this factor are Dodoma, Tabora, Singida, Shinyanga, etc.

They also explained other factors, such as the ocean current. *Areas facing a warm ocean current tend to assume a warm climate, like the East African coast, which assumes a warm climate due to the presence of a warm Mozambique ocean current, while the southern African coast assumes cold weather due to the presence of a Benguela cold ocean current.* Furthermore, the candidates elucidated additional factors, such as the earth's distance from the sun, which is determined by its aphelion and perihelion. For instance, during the aphelion, when the earth is at its furthest distance from the sun, approximately 150km away on July 4th, it experiences a low temperature. Conversely, during the perihelion, when the earth is closest to the sun, it experiences a high or hot temperature, which occurred on January 3rd *Altitude is defined as the height of the land above the sea level or mean sea level, where the higher levels record a low temperature while areas of low altitude assume a hot temperature due to the lapse rate, as it assumes that the higher you go (high altitude), the cooler it becomes, and vice versa.* And *aspect, this is an area of the land receiving either sunshine or not, rainfall or not, for this reason, some places that receive sunshine will assume high temperatures, unlike in the shadow part of the area, this factor affects the temperature intensity over time in different areas*. Finally, they came to a relevant conclusion. Strengths and the correct elaborations of their points caused the variations in their marks. Extract 9.1 illustrates good responses to this question.


9. Temperature is the degree of hotness or coldness of a body or an area. Temperature is one of the weather elements. Temperature is measured by using a thermometer. The minimum thermometer measures the minimum temperature reached in a day, maximum thermometer measures the maximum temperature reached in a day and six's thermometer measures both maximum and minimum temperature reached in a day. There are several factors that affect temperature of a place. The

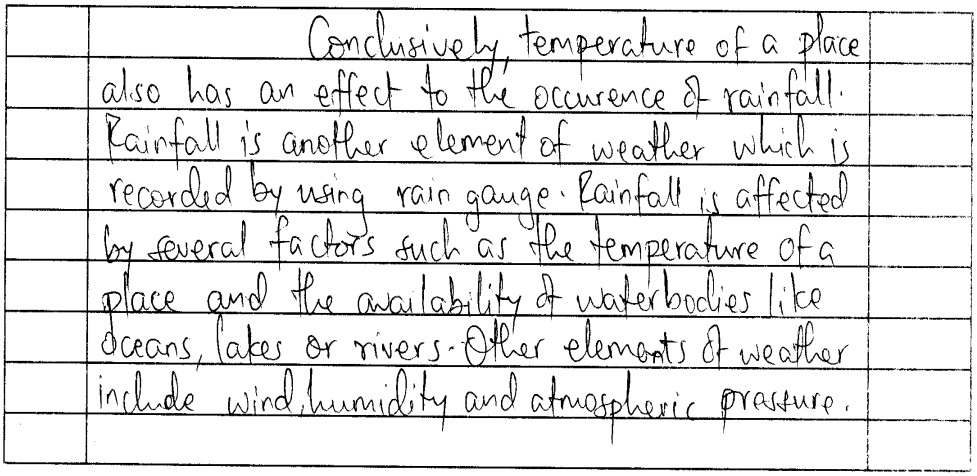
9. following are the factors affecting temperature from one place to at another;

Altitude of the land. Altitude is the vertical height of land from the mean sea level. As one moves up to higher heights from the sea level, the temperature is likely to drop. This is due to the environmental lapse rate which states that the higher you go, the cooler it becomes. This shows that at higher altitudes there is low temperature.

Distance from the sea or ocean. The areas which are found near the sea or ocean experience high temperature than the ones which are far from the sea. This is because much wind which flows from the ocean warms the land.

Ocean currents. This refers to the movement of surface water in the ocean. Ocean currents affects the temperature of a place. Warm ocean currents heats up the land and may lead to formation of heavy rdinfall for example Mozambique warm ocean currents Warm East African Coast.

Latitude of the area. These are angular distances measured in degrees north and south of the equator. Latitude affects the temperature of a place. Areas found near the equator or at the equator experience high temperature due to overhead sun. Areas that are further from the equator recieves little sunlight which lowers the temperature of place.


Conclusively, temperature of a place also has an effect to the occurence of rainfall. Rainfall is another element of weather which is recorded by using rain gauge. Rainfall is affected by several factors such as the temperature of a place and the availability of waterbodies like oceans, lakes or rivers. Other elements of weather include wind, humidity and atmospheric pressure.

Extract 9.1: A sample of correct responses for question 9

Apart from that, 39,237 (12.20%) candidates with average scores had a moderate performance. Their responses demonstrated the candidates' inadequate knowledge about the subject matter. In this category, some of them provided relevant introductions and mixed up correct and incorrect responses with weak conclusions. Some provided relevant introductions, explained a few points partially, and ended up with weak conclusions, whereas others provided the introduction of *global warming* instead of *temperature and* explained its causes with a conclusion. For example, one student wrote a relevant introduction but mixed up the correct and incorrect causes of the gradual increase in temperature and ended up with a weak conclusion. *Human activity and forest cover* were examples of incorrect responses. The candidate failed to recall that these are the factors affecting rainfall. Those responses indicated the candidates' general knowledge of the factors affecting the elements of weather but failed to identify specifically the factors affecting temperature, as the factors mentioned affect rainfall. He or she also came to a weak conclusion.

Another candidate wrote a relevant introduction but mixed up points and gave a weak conclusion. *The development of manufacturing industries and transportation were two examples of incorrect points.* Those responses showed the candidate's inadequate knowledge about specific factors affecting *temperature* because the mentioned points are the factors that cause environmental pollution or global warming.

A total of 266,387 (82.80%) candidates with weak performance had little knowledge about the topic of *weather*, particularly the sub-topic of elements of weather. They also failed to correctly recognize factors that

affect an area's temperature. Their lack of understanding caused them to provide weak responses. For example, some candidates provided incorrect introductions and mixed up correct and incorrect responses without a conclusion. Some of them wrote a weak introduction, explained a few points partially, and provided a weak conclusion, while others provided an incorrect introduction, main body, and conclusion.

For example, one candidate wrote an introduction to global warming and its causes rather than a temperature. Also, he or she provided an incorrect conclusion. Industrial activities, mining activities, forest burning, and agricultural chemicals were the causes of global warming. Similarly, the candidate's responses showed general knowledge about the factors that cause environmental degradation. *However, they failed to identify specific factors influencing the temperature.* Extract 9.2 depicts incorrect responses to this question.

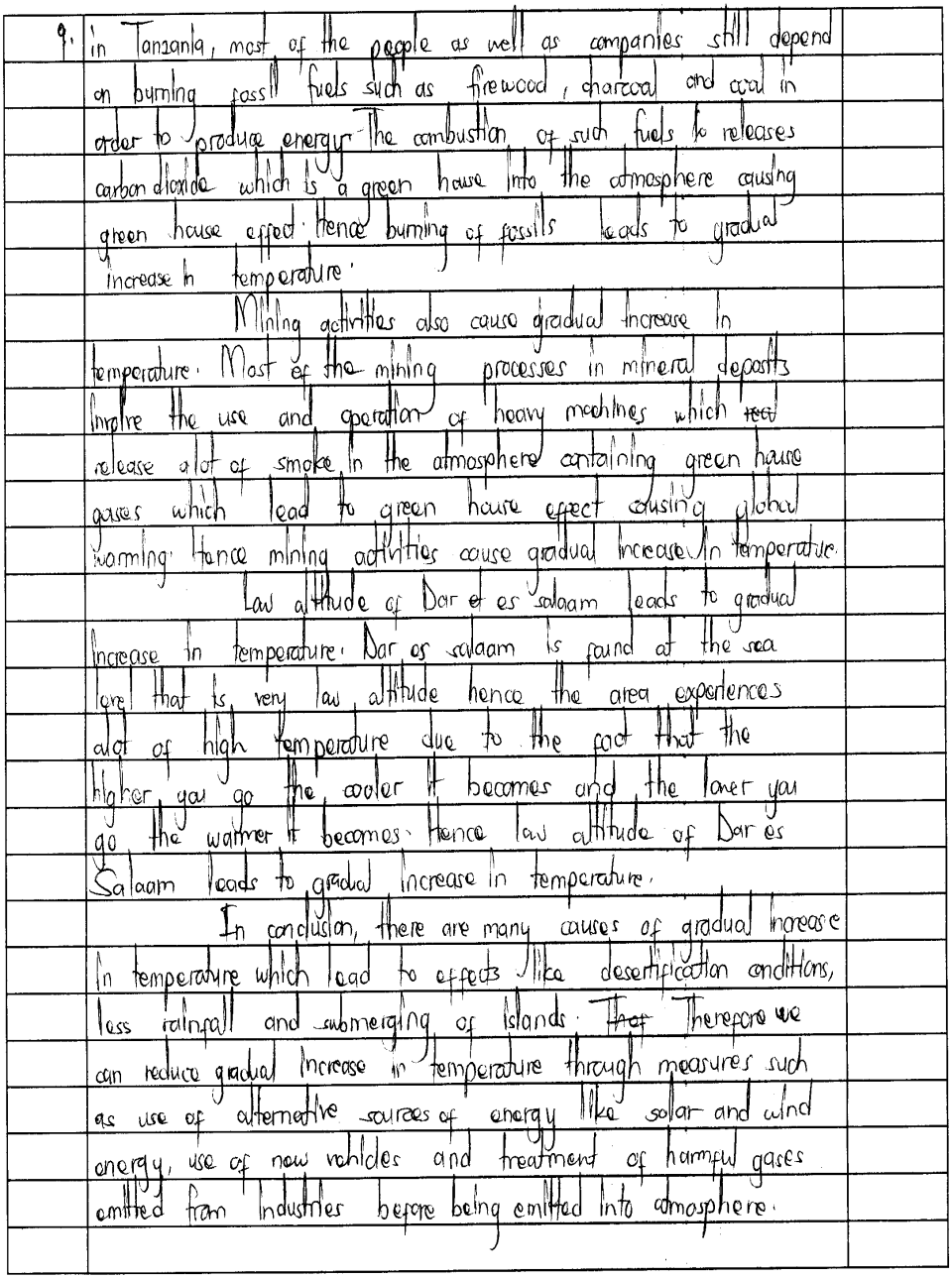
q. Global warming refers to the gradual increase in the average temperature of the earth due to green house effect. Green house effect is the phenomenon where by green house gases trap the infrared radiations from the earth and re-radiate them back to the earth leading to increase in temperature. Examples of green house gases are chlorofluorocarbons (CFCs), methane, Carbon dioxide, nitrogen dioxide gas, sulphur dioxide gas and halons. The following are some of the causes of the gradual increase in temperature;

Emission of harmful gases into the atmosphere from industries leads to gradual increase in temperatures. Most of the industries in tanzania such as Tanica industry release ~~out~~ or emit harmful gases such as carbon dioxide into the atmosphere which is a green house gas leading to green house effect. Hence emission of harmful gases into the atmosphere from industries leads to gradual increase in temperature

Bush burning leads to gradual increase in temperature. In most of the rural areas people use bush burning to clear large forests and bushes for various purposes such as creating settlement as well as establishing plantations. The practice of bush burning releases carbon dioxide into the atmospher which is a green house gas leading to green house effect. Hence bush burning leads to gradual increase in temperature.

Driving of old vehicles which emit smoke leads to gradual increase in temperature. Most of the people in Dar es Salaam still drive old vehicles with dirty oil causing emission of dirty smoke containing harmful gases like carbon dioxide to the atmosphere which leads to green house effect. Hence driving of old or ancient vehicles like cars and buses lead to gradual increase in temperature.

Burning of fossil fuels leads to gradual increase in temperature. Due to poor or low level of science and technology



9. In Tanzania, most of the people as well as companies still depend on burning fossil fuels such as firewood, charcoal and coal in order to produce energy. The combustion of such fuels to releases carbon dioxide which is a green house into the atmosphere causing green house effect. Hence burning of fossils leads to gradual increase in temperature.

Mining activities also cause gradual increase in temperature. Most of the mining processes in mineral deposits involve the use and operation of heavy machines which ~~feed~~ release a lot of smoke in the atmosphere containing green house gases which lead to green house effect causing global warming. Hence mining activities cause gradual increase in temperature.

Low altitude of Dar ~~e~~ es salaam leads to gradual increase in temperature. Dar es salaam is found at the sea level that is very low altitude hence the area experiences alot of high temperature due to the fact that the higher you go the cooler it becomes and the lower you go the warmer it becomes. Hence low altitude of Dar es Salaam leads to gradual increase in temperature.

In conclusion, there are many causes of gradual increase in temperature which lead to effects like desertification conditions, less rainfall and submerging of islands. ~~That~~ Therefore we can reduce gradual increase in temperature through measures such as use of alternative sources of energy like solar and wind energy, use of new vehicles and treatment of harmful gases emitted from industries before being emitted into atmosphere.

Extract 9.2: A sample of incorrect responses for question 9

In extract 9.2, the candidates explained the causes of global warming rather than the causes of the gradual increase in temperature from Iringa to Dar es Salaam.

2.3.2 QUESTION 10: Environmental Issues and Management

This question tested the candidates' knowledge of the concept of *Environmental Issues and Management.* The candidates were required to read and then respond to the question that followed. The statement was that: *Environmental degradation is a serious problem caused by human activities. Examine six measures to be taken to prevent the situation.*

A total of 482,356 candidates opted for this question. Among them 196,054 (40.65%) scored from 00 to 4.5 marks, 162,129 (33. 61%) scored from 5 to 9.5 marks and 124,173 (25.74%) scored from 10 to 15 marks. The performance of candidates in this question is illustrated in figure 10.

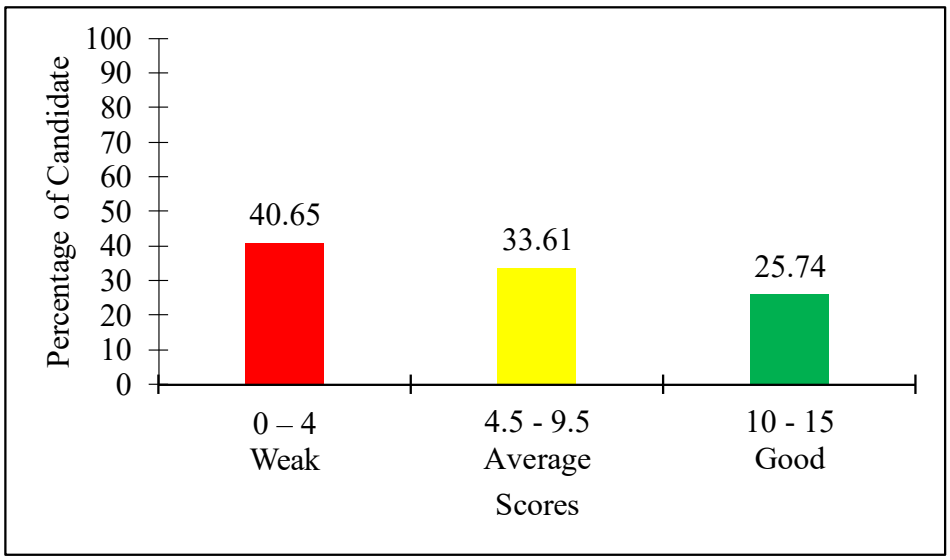


Figure 10: *The percentage of candidates' performance for question 10*

The candidates 124,173 (25.74%) who scored highly, had adequate knowledge about *Environmental Issues and Management*, particularly on ways of conserving the environment. Those candidates provided the relevant introduction, main body, and conclusion. To illustrate the case, one candidate provided the following introduction; *Environmental degradation is the situation in which the quality of the environment declines as a result of the occurrence of pollution, loss of biodiversity, deforestation, and desertification. The situation is mainly contributed by human activities like agriculture, mining, lumbering and industrial activities.*

Also, He/she explained measures to prevent environmental degradation such as the use *of afforestation and reforestation, which involves planting*

trees in areas without trees or areas where the vegetation has been cut, this helps to prevent soil from being eroded. Soil conservation is the environmental conservation measure, that involves protecting the soil from being eroded either by wind or water, this may be done by either controlling animal grazing, destocking or zero grazing, and planting trees. Proper farming methods involve the use of terracing, crop rotation, contour farming, and mulching to protect the soil from being eroded or losing its fertility. Promotion of alternative sources of energy like biogas, natural gas, solar energy, and geothermal power should be promoted and used, this should be done to reduce pressure on forest resources through charcoal burning and firewood harvest which results in deforestation.

Furthermore, the candidates explained measures to prevent environmental degradation which included; *Protecting water catchment areas, to conserving water sources, biodiversity, and other natural resources. Recycling waste materials involves reusing materials like plastic bags, bottles, and papers instead of throwing them, this helps in reducing the amount of waste materials in the environment. Provision of mass education on environmental issues, there is a need for government and non-government agencies to provide mass education on the importance of environmental conservation/establishment NGOs dealing with environmental conservation. Enacting or enforcing laws and rules that promote environment/ urbanization proper settlement schemes* and *control the human population through family planning programs.* In addition to that, they ended up with the relevant conclusion. The strengths of their points caused variation in their marks. Extract 10.1 shows a sample of good responses to this question.

10. Environmental degradation refers to the destruction of the environment mainly due to human activities. Human activities refer to the total activities done by man to sustain a living. Such human activities include industrialization, mining, agriculture among others. Environmental degradation leads to death of organisms, loss of biodiversity and dumption of tourism activities. Environmental degradation can be prevented by applying the following measures:

Formulation of strict laws against environmental degradation. The local authorities should make laws which greatly condemn the degradation of the environment. Such laws should be accompained by strict and harsh punishments like heavy fine and long years of imprisonment. This will sensitize people to stop degrading the environment.

Encouraging afforestation, reafforestation and agroforestry. To prevent desertification due to environmental degradation, the local authorities should encourage the culture of planting new trees and replacing the cut down trees. This can be through policies like "cut a tree, plant five" This will greatly reduce on the problem of environmental degradation.

Undertake population control measures. The authorities should control the population so as to prevent environmental pollution. This is because, the higher the population the more the rate of environmental degradation due to over utilization of resources. This will reduce on the problem of environmental degradation.

Creation of designated dumping sites. In most urban areas, disposal of urban wastes is a challenge because people can't dispose their wastes in a special area. In that case, the

10 local authorities should try their level best and create dumping sites so that urban wastes from market places due to trading activities can get disposed safely.

Banning the use of explosives bomb in fishing activities. In fishing, some fishermen use explosives like dynamite so as to get fish. The government through the local authorities should ban these explosives from being used so as to conserve the water resources. In that case environmental degradation is minimized.

Encouraging the use of renewable energy sources. The renewable energy sources like solar energy, wind energy and hydro-electric power should be used because they are environmental frendly rather than the non-renewable energy sources. In that case, industries should adopt renewable sources of energy so as to prevent environmental pollution

In conclusion, environmental protection should be given a priority by the local authorities by giving mass education to the citizens on how to conserve the environment.

Extract 10.1: A sample of incorrect responses for question 10

Apart from that, 162,129(33.61%) candidates with average scores had moderate knowledge of *Environmental Issues and Management*, especially on ways of conserving the environment. In this group, some candidates provided relevant introductions and explained a few points without a conclusion. Some of them provided weak introductions and mixed up correct and incorrect responses without a conclusion while others did not provide an introduction, and mentioned correctly all points without explanations. Also, they ended up with an incorrect conclusion. For example, one candidate provided a weak introduction, and mixed up correct and incorrect responses with no conclusion. Examples of incorrect responses were *deforestation* and *overstocking*. This candidate failed to realize that these are the causes of environmental degradation

A total of 196,054(40.65%) candidates who scored low marks, indicated limited knowledge of the subject matter. Some of them provided irrelevant introductions but mentioned a few points without a conclusion. Some candidates wrote weak introductions and mentioned a few points without explanations and conclusions. Some of them provided incorrect introductions, they explained *causes of environmental degradation* instead of *measures to prevent environmental degradation*. Those responses indicated the candidates' general knowledge of the concept of environmental issues but lacked specific knowledge of the measures to be taken to prevent environmental degradation. While others did not provide an introduction but wrote a few correct points without a conclusion. Extract 10.2 indicates a sample of incorrect responses for this question.

10. Enviromental degradation: degradation by which the enviroment becomes degraded due to the layer destructions mainly about the human activities: this are the activities done by human being so as to earn money the activities done by this people they can be both advantageous and also disadvantageous to the surrounding enviroment this is to mean that they have to be controlled by they can cause enviromental degradation in one way or another the following are the ways that can cause degradation.

Agriculture activities leads to deforestation that degrade the enviroment Hence should be avoided: the Agricultural activities before its establishment it needs a clear land and the only way to get a clear land hence the land must be cleared hence people should avoid the activities.

Mining activities leads to deforestation that degrade the enviroment hence should be eliminated: the mining activities also leads to the deforestation meaning that they also need a point of making sure that they also have. the activities should be eliminated and policies to be made.

Industrial waste leads to unrate sewage treatment that degrade enviroment Hence be abolished the industrial waste should be abulished because yes it can also result to the degradation of the enviroment leading to the ozone layer destruction.

10 Cultivation of crops leads to the lum bering activities leading to degradation. Hen e should be prohibited. The crop cultivation also needs a clear land for the cultiva tion therefore they practice lumbering the refore the activities like should also be able to prohibit them

The harmful gases emmited from the in dustries leads to ozone layer destruction hence degrade environment is to be abolished the harmful gases emmited from the indu stries hence the activities can also lead to the destruction of the ozone layer therefore the emmision of the harmful gases should be abolished.

Farming along water bodies also contam inate water causing environental degrada tionhence should be avoided. The farming alon g water bodies also contaminated water hence degradation) and hence they can be very strict to the people that also promote the laws.

In a nut shell: the human activities along mon- sites can lead to the en vironmental degradation and hence should be strictly prohibited and thus be elim nated.

Extract 10.2: A sample of incorrect responses for question 10

In Extract 10.2 the candidates explained on causes of environmental degradation instead of examining six measures to be taken to prevent environmental degradation

2.3.3 QUESTION 11: Sustainable Use of Power and Energy Resources

This question assessed the candidates' knowledge of the concept of the *Sustainable Use of Power and Energy Resources*. The candidates were required to respond to the following question; *Describe six sources of renewable energy found in Tanzania*.

A total of 252,870 candidates opted for this question. Among them 131,764 (52.11%) scored from 00 to 4.5 marks, 81,075 (32.06%) scored from 5 to 9.5 marks and 40,031 (15.83%) scored from 10 to 15 marks. The performance of candidates in this question is illustrated in Figure 11.

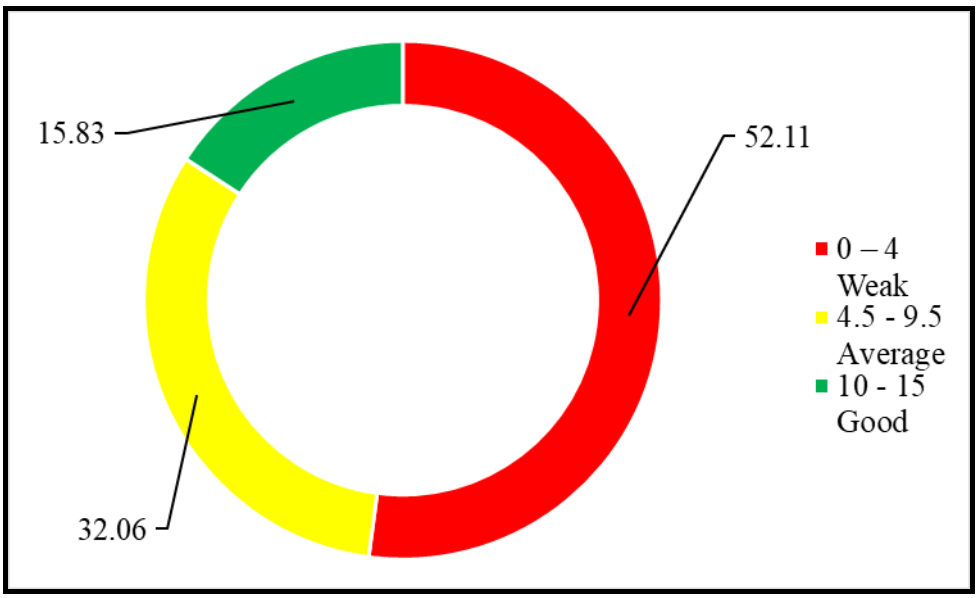


Figure 11: *The percentage of candidates' performance for question 11*

The analysis indicates that the performance of this question was average as 47.89 percent of candidates had average performance.

Data analysis showed that 40,031 (15.83%) of candidates had adequate knowledge on the topic of the *Sustainable Use of Power and Energy Resources,* particularly on the major categories of the sources of power and energy. Those candidates provided a relevant introduction, main body, and conclusion. The relevant introduction provided was that *renewable energy resources are those energy that are naturally replaced. The energy can be derived from sunlight, tides, wind, water, geothermal, and biomass. Sources of energy played an important part in the development of different economic activities in Tanzania such as in agriculture, industries, mining, and transportation*.

Also, they explained renewable sources of power that are found in Tanzania such as; *Wind power: This is the power generated from moving wind. Wind energy is used in wind mills to pump water from the ground. Wind energy requires wind turbines to turn wind mills that have propellers while the motor is connected to a main shaft that spins the generator to generate energy. Hydro – Electric – Power / Water / Tides / Waves: This is the power generated by moving water, in most cases must be located near or in large flowing water. The generation of it needs mechanical energy which helps to rotate the wheel hence converting it into electrical energy. Geothermal energy / Volcanic energy: This is the heat energy that is generated and stored in the earth. Tapping geothermal energy involves pumping cold water into hot rock boreholes and extracting stem through another borehole. Due to the force of the hot water turbines can be driven hence the production of electricity.*

Furthermore, they explained renewable sources of power which were; *Biogas / Biomass: This is the mixture of gases produced by decomposition of organic matter such as waste from manure, plant materials, sewage, and green waste food. The main components of biogas are methane and carbon dioxide Solar power / Sunshine: This is the power generated from the sun's rays by using collector panels. The collected energy can be used to provide heat, light, or another form of electricity. The distribution of solar energy depends on the overhead sun of a particular place.* In addition to that, they ended up with a relevant conclusion. However, their scores varied depending on the strengths of their responses. Extract 11.1 demonstrates the correct responses to this question.

11. Renewable energy sources are sources of energy which can not be finished and are usua lly environmentally friendly. Renewable energy sources can be replenished after being used. Rene wable energy sources are also considered as sustai nable energy sources since they have no negative effects on the environment and are found easily in the environment. The following are the sources of renewable energy in Tanzania.

Wind energy. Wind is very useful in the production of electric power. Wind energy can be converted into electrical energy by the use of wind mills. Wind mills are usually established in high

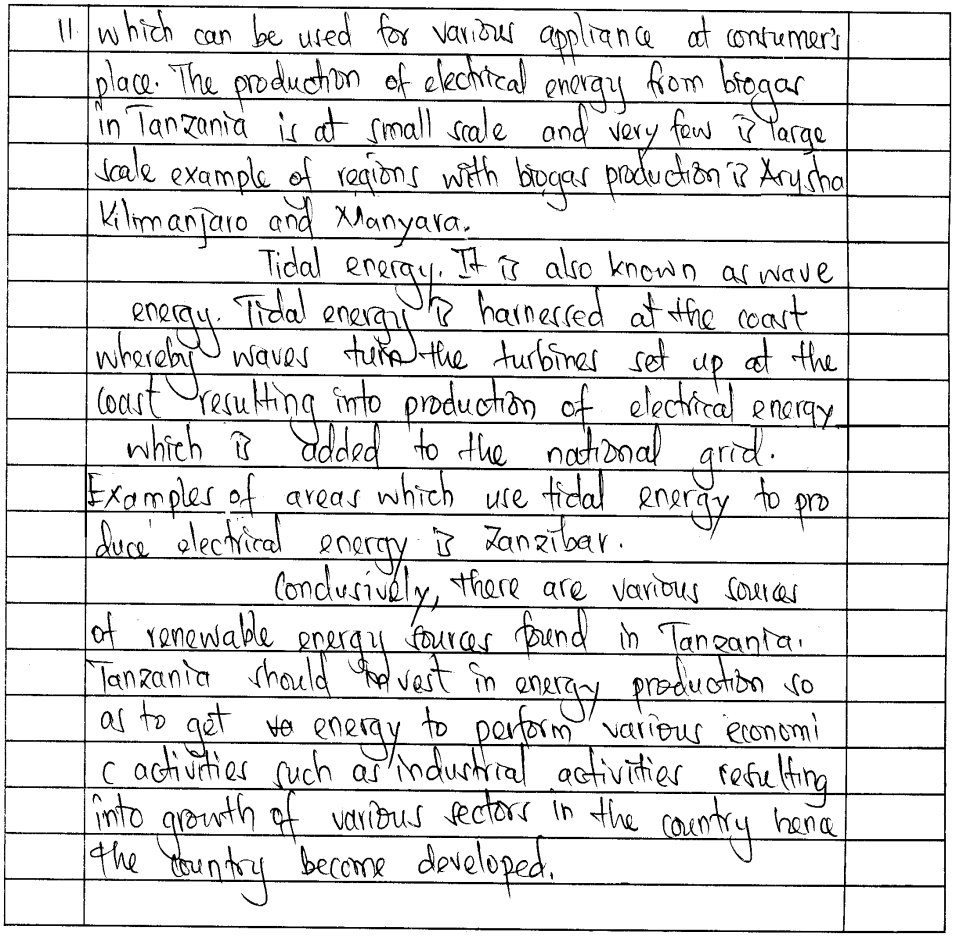
11 land areas and areas with strong winds so as to turn the windmills to produce electrical energy example windmills are found in Dodoma, Tanzania and are used to pump water.

Solar energy or the sun. The sun produces solar energy which can be converted into electrical power by the use of solar panels. Solar panels have photovoltaic cells which convert solar energy to electrical energy. Nowadays many appliances use electrical energy from solar energy to function example solar bulbs, calculators, solar cookers and also solar radios.

Hydro-Electric Power. This is the energy which can be harnessed from running water. The running water turns the turbines so as to generate hydro-electric power. Hydro-electric power is harnessed from hydro-electric dams example of hydro-electric dams are Kidatu dam and Nyumbaya Mungu dam in Tanzania. Hydro-Electric Power contributes the largest percentage to the electricity of Tanzania.

Geothermal energy. This is found in areas with hot springs and geysers Hot springs and geysers are formed when water lies over hot rocks and forces to come out through a fault. Usually by the use of turbines the geothermal energy is converted to electrical energy which is supplied to the national grid example geothermal power station have been set up in Arusha

Biogas. It is produced by the fermentation of organic wastes. It mainly consists of methane. Biogas can be produced by a biogas converter. The biogas produced can be converted into electrical energy


11 which can be used for various appliance at consumers place. The production of electrical energy from biogas in Tanzania is at small scale and very few is large scale example of regions with biogas production is Arusha Kilimanjaro and Manyara.

Tidal energy. It is also known as wave energy. Tidal energy is harnessed at the coast whereby waves turn the turbines set up at the coast resulting into production of electrical energy which is added to the national grid.

Examples of areas which use tidal energy to produce electrical energy is Zanzibar.

Conclusively, there are various sources of renewable energy sources found in Tanzania. Tanzania should invest in energy production so as to get the energy to perform various economic activities such as industrial activities resulting into growth of various sectors in the country hence the country become developed.

Extract 11.1: A sample of correct responses for question 11

On the other hand, candidates 81075, (32.06%) who scored average, had insufficient knowledge about the concepts of the *Sustainable Use of Power and Energy Resources*, especially on the major categories of the sources of power and energy. For example, some candidates provided relevant introductions and mixed up correct and incorrect points without a conclusion. Some of them gave irrelevant introductions, and explanations of a few points with weak conclusions, while others provided weak introductions, explaining a few points without conclusion. For example, one candidate wrote a relevant introduction but mixed up correct and incorrect points with a weak conclusion. Examples of incorrect responses were; *Coal* and *oil* while another candidate described the source of renewable energy, found in Tanzania as *firewood* and *charcoal.* These responses demonstrated the candidates' general understanding of the concept of power and energy resources but lacked the knowledge to

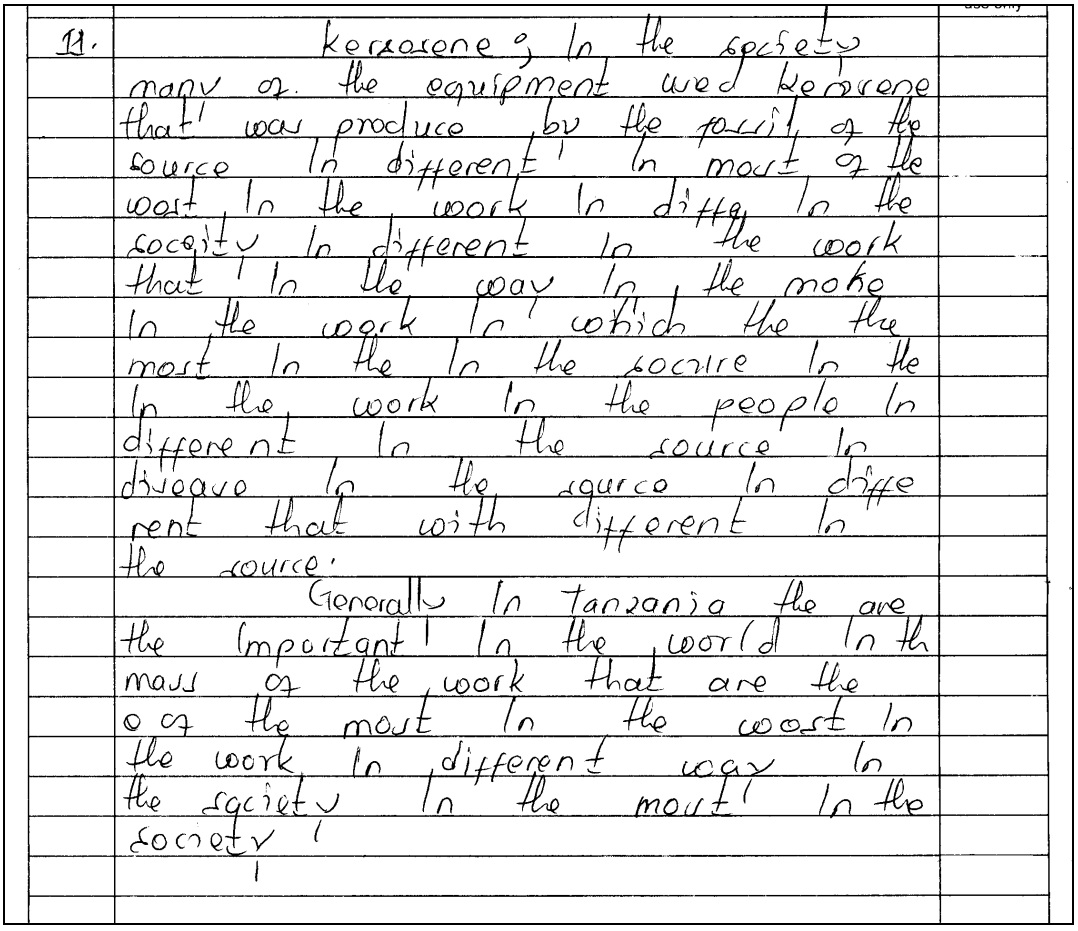
distinguish the two major categories of sources of power and energy because the mentioned points are *non–renewable sources.*

In contrast, 131,764 (52.11%) candidates with weak performance had little knowledge of the subject matter. For example, some candidates provided incorrect introductions, main body as well as conclusions. Some of them wrote relevant introductions but provided correct and incorrect points without conclusions, while others wrote irrelevant introductions but mentioned points without explanations and another group explained factors influencing the location of industries instead of sources of renewable energy. For example, one candidate provided an incorrect introduction and explained *petroleum, diesel,* and *gas* while another candidate wrote nuclear energy and natural gas, as sources of renewable energy found in Tanzania. Extract 11.2 reveals incorrect responses to this question.

11. Renewable energy is the energy that is formed in the energy in the sphere by able to made and Irrecoverable, and make product in their accomable in the earth surface. In Tanzania country of Tanzania. the following are the renewable energy that are found source in Tanzania country as follows:

Petrol; is the soure of renewable that is generated by the remain of fossil under the ground in the source that would have the product of the renewable source in In order that made the Land to have the great in the most of the work in different way in the area that is the source of general like Dar-es-salaam.

Diesel; In the soure to is product in many of the various in the Tanzania in kinds and Dar-es-salaam in most of the part in Shinyanga in Iringa in the work in different area in the source that in the work in the source of the work in the in the renewable in the wake that work in the source in the most of the most in the source in distance in the source.


11. Kerosene, In the society many of the equipment wed kerosene that was produce by the fossil of the source In different In most of the wast In the work In diffe In the society In different In the work that In the way In the make In the work In which the the most In the In the source In the In the work In the people In different In the source In diveave In the source In diffe rent that with different In the source.

Generally In Tanzania the are the Important In the world In th mass of the work that are the o of the most In the wast In the work In different way In the society In the mout In the society

Extract 11.2: A sample of incorrect responses for question 11

In Extract 11.2 the candidates provided irrelevant introductions and explained non-renewable energy resources such as petroleum, diesel, and kerosene instead of explaining renewable energy resources such as wind, solar energy, geothermal energy, fuel wood, and hydroelectric power.

3.0 ANALYSIS OF THE STUDENTS' PERFORMANCE IN EACH TOPIC

The CSEE 2023 Geography Examination paper consisted of 11 questions that were set from 16 topics namely: *The solar system, Soil, Transport, Agriculture, Forces that Affect the Earth, Human Population, Sustainable Mining, Manufacturing Industry, Environmental Issues and Management, Map Reading and Interpretation, Introduction to Research, Elementary Survey and Map Making, Photograph Reading and Interpretation, Climate and Natural Regions, Weather* and *Sustainable Use of Power and Energy Resources*.

The analysis of the candidates' performance per topic in CSEE 2023 indicated that candidates had a good performance in the following topics; *Elementary Survey and Map Making* (72.76%). *Environmental Issues and and Management* (70.24%) *and Solar System, Soil, Transport, Agriculture, Forces that Affect the Earth, Human Population, Sustainable Mining,* and *Manufacturing Industry* which were tested in multiple-choice items *(67.93%).* Moreover, *Sustainable Use of Power and Energy Resources* (48.69%), *Introduction to Research* (35.99%), and *Map Reading and Interpretation (35.6%)* had average performance.

The candidates had weak performance on the following topics; *Photograph Reading and Interpretation* (29.93%), *Climate and Natural Regions* (20.99%), *Weather* (17.20), and *Forces that Affect the Earth* (4.15%).

4.0 CONCLUSION

The analysis of individual questions shows that the general performance of the Geography subject (CSEE) in 2023 was good since 64.32 percent of the candidates passed while 35.68 percent failed. The level of performance has decreased by 1.78 percent as compared to that of 2022 where 66.10 percent of candidates passed and 33.9 failed. The candidates who passed the examination demonstrated awareness of the demands of the questions, adequate knowledge of the subject matters tested, good essay writing skills, adequate mathematical skills, drawing skills, Map reading and Interpretation skills, Photograph Interpretation skills, and good command of the English language.

5.0 RECOMMENDATIONS

Based on the observations made through the analysis in this report, the following are suggested to improve the performance of the candidates in the Geography subject examinations;

(a) Candidates should be emphasized to use the English language in their communications within and outside the school compounds. This can be achieved by establishing English-speaking programs, to improve the candidates' vocabularies, grammar, writing skills, and logical arguments. More emphasis should be focused on the introduction of debating clubs, prompt morning speeches, intra or inter-school academic quizzes competitions.

(b) The use of different teaching and learning strategies should be encouraged and its choice should base on the demand of specific topic and competence targeted. For example, in topics like *weather, Forces that Affect the Earth's surface* and *climate and Natural Regions* topic, the use of study tours, pictures and TV programs will improve the students' competencies so as to enable them understand these topics well.

(c) Students centred pedagogy approach should be used in teaching the *Photograph Reading and Interpretation* topic. This method facilitate leaning by doing and enable retention of knowledge among the learners.

(d) Students should read questions carefully to identify the requirements of each question. This will overcome the challenge of the candidates' inability to identify the requirements of the questions, hence answering the questions irrelevantly.

Appendix:

SUMMARY OF THE CANDIDATES' PERFORMANCE IN EACH QUESTION FOR 013 - GEOGRAPHY - CSEE 2023

S/N	Topic	Question Number	% of students who scored 30 marks and above	Remarks
1.	Elementary Survey and Map Making	5	72.76	Good
2.	Environmental Issues and Management	2 & 10	70.24	Good
3.	The Solar System, Soil, Transport, Agriculture, Forces that Affect the Earth, Human Population, Sustainable Mining, Manufacturing Industry,	1	67.93	Good
4.	Sustainable use of Power and Energy Resources	11	47.89	Average
5.	Introduction to Research	4	35.99	Average
6.	Map Reading and Interpretation	3	35.86	Average
7.	Photograph Reading and Interpretation	6	29.93	Weak
8.	Climate and Natural Regions	8	20.99	Weak
9.	Weather	9	17.20	Weak
10.	Forces that Affect the Earth	7	4.15	Weak