



**THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA**



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

BIOLOGY



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033 BIOLOGY

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FOREWORD

This report presents Students' Items Response Analysis (SIRA) on the Form Two National Assessment (FTNA) 2023 in Biology subject. The (FTNA) is a formative evaluation which provides feedback that teachers, students and other education stakeholders can use to improve teaching and learning process.

The report reveals that the performance in Biology in FTNA 2023 was average as 55.74 per cent of the students passed the assessment. The students who attained high scores had sufficient knowledge of the assessed concepts, ability to understand the demands of the questions and good drawing skills. However, weak performance was attributed by insufficient knowledge of the students on the tested concepts, failure to understand the demands of the questions, poor proficiency in the English Language and insufficient drawing skills.

The National Examinations Council of Tanzania (NECTA) expects that the feedback provided in this report will be resourceful to explain the challenges for which education stakeholders should take proper measures to improve teaching and learning of the Biology subject. Consequently, students will acquire knowledge, skills and competences indicated in the syllabus for better performance in future assessments and examinations.

The Council appreciates the contribution of all those who prepared this report.



Dr. Said Ally Mohamed
EXECUTIVE SECRETARY

1.0 INTRODUCTION

The report presents the analysis of responses provided by the students who sat for the Form Two National Assessment (FTNA) in Biology 2023. The FTNA paper in Biology was set in accordance with the NECTA format issued in the year 2021 which is based on 2005 Biology syllabus for secondary education, reprinted in 2012.

The assessment paper contained sections A, B and C. Section A consisted of two (2) objective questions. Question 1 consisted of 10 multiple choice items, while question 2 comprised of five (5) matching items. Section B consisted of seven (7) short answer questions, whereas section C comprised one (1) essay question. The students were required to answer all questions in all sections.

A total of 694,882 students sat for Biology FTNA 2023 where 318,146 (45.78%) were male and 376,736 (54.22%) were female. The analysis shows that the general performance in this subject was average because 386,866 (55.74%) students passed the assessment. The summary of the students performance based on Sex and Grades is presented in Table 1:

Table 1: The Students' Performance in Biology FTNA 2023

Sex	Grades				
	A	B	C	D	F
Male	24,755	20,287	64,521	89,943	118,218
Female	17,249	14,545	52,313	103,253	188,929
Total	42,004	34,832	116,834	193,196	307,147

Table 1 shows that most of the students who passed (193,196) attained D grade which is a marginal pass. A few of them (42,004) attained A grade, the majority (24,755) of them being males. The students' performance in the year 2023 has increased by 8.78 per cent when compared to 2022 Biology FTNA in which 634,781 sat for the paper and 297,344 (46.96%) students passed the assessment.

The next part of this report provides analysis of the students' performance on each question. It begins by explaining what the questions required and proceeds to the analysis of students' responses. The analysis has highlighted

the challenges that the students faced in responding to the questions and suggests the plausible reasons as to why it occurred. Extracts of responses from the students' scripts have been presented to show how they responded to the questions in view of the demand of each question.

The analysis of the national assessment results were categorized into five score intervals, which are: 75 - 100 (excellent), 65 - 74 (very good), 45 - 64 (good), 30 - 44 (satisfactory) and 0 - 29 (fail). However, for the purpose of this report, the analysis of students' responses to a particular question were considered to be good, average or weak if the percentage of the students who scored 30 per cent or above of the marks allocated to the question fell within the range of 65 to 100, 30 to 64 and 0 to 29, respectively. Moreover, the green, yellow and red colours have been used in charts and graphs to indicate good, average and weak performance, respectively.

2.0 ANALYSIS OF THE STUDENTS' PERFORMANCE PER QUESTION

This section analyses the performance of the students in each question in sections A, B, and C.

2.1 Section A: Objective Questions

This section consisted of two questions. Question one (1) and two (2) which were multiple choice and matching items, respectively. The students were instructed to answer all the questions.

2.1.1 Question 1: Multiple Choice Items

This question had 10 multiple choice items, carrying a total of 10 marks. For each of the items (i) to (x), students were required to choose the correct answer from the given four (4) alternatives and write its letter (A, B, C or D) against the item number in the box provided. The items were set from seven (7) topics, which are: Introduction to Biology, Transport of Materials in Living Things, Health and Immunity, Gaseous Exchange and Respiration, Nutrition, Classification of Living Things and Balance of Nature.

This question was attempted by all students 694,882 (100%). Among these, students 96,914 (13.95%) scored from 0 to 2 marks out of whom, 5,939 (0.85%) scored 0. Students who scored from 3 to 6 marks were 466,703

(67.16%), whereas 131,265 (18.89%) scored from 7 to 10 marks out of whom, 5,277 (0.76%) scored all the 10 marks allocated in this question. Figure 1 summarizes the students' performance on question 1.

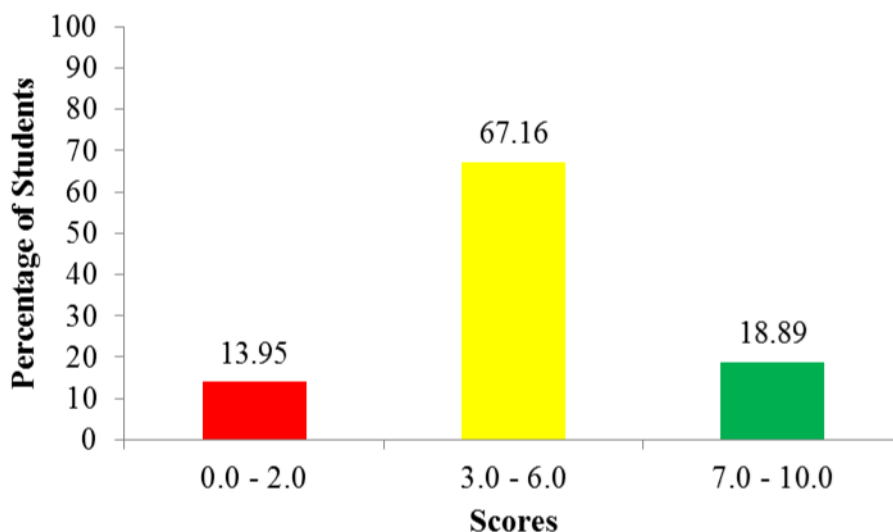


Figure 1: *Students' performance on question 1*

Figure 1 shows that the general performance on this question was good because 86.05 per cent of the students scored from 3 to 10 marks. The students who scored high marks (7 - 10) had adequate knowledge of the concepts tested. Therefore, they chose correct responses to all or most of the items. Those who scored low marks (0 - 2) they either provided correct responses to 2 items or provided incorrect responses to all. This implies that these students had inadequate knowledge of the concepts tested. The analysis of the items is presented as follows:

Item (i) *Which branch of Biology deals with the study of plants?*

A Taxonomy

B Botany

C Ecology

D Zoology

The correct answer was *B, Botany*. Students who got it correct had adequate knowledge of basic concepts and terminologies of Biology. Conversely, students who chose *D, Zoology* did not recognize that zoology is the study of animals. Furthermore, those who chose alternative *A, Taxonomy* and *C, Ecology* did not realize that taxonomy deals with

classification of living things while Ecology deals with relationship between organisms and their environment.

Item (ii) *A teacher sprayed a perfume in one corner of the classroom and after 10 minutes, the entire classroom was filled with the smell of the perfume. Which process was demonstrated by the teacher?*

- | | | | |
|----------|----------------------|----------|------------------|
| <i>A</i> | <i>Osmosis</i> | <i>B</i> | <i>Mass flow</i> |
| <i>C</i> | <i>Transpiration</i> | <i>D</i> | <i>Diffusion</i> |

The correct response was *D, Diffusion*. Students who chose *D, Diffusion* were aware that diffusion is a movement of molecules from the area of high concentration to the area of low concentration. However, some students chose *A, Osmosis* while others chose *B, Mass flow*. These students were not aware that osmosis involves movement of water molecules from area of low concentration to the area of high concentration through semi-permeable membrane. Mass flow involves bulk movement of substances from one region to another due to the difference in pressure between the two regions. Likewise, those who opted for *C, Transpiration* were not aware that Transpiration is the process by which plants lose water through the stomata in the leaves.

Item (iii) *Farmers in Naiva village complain of passing blood-stained urine and faeces. Which disease is likely affecting them?*

- | | | | |
|----------|-------------------|----------|----------------|
| <i>A</i> | <i>Gonorrhoea</i> | <i>B</i> | <i>Cholera</i> |
| <i>C</i> | <i>Bilharzia</i> | <i>D</i> | <i>Malaria</i> |

The correct answer was *C, Bilharzia*. Students who got it correct had sufficient knowledge about the symptoms of common infections and diseases. They were aware that passing out blood-stained faeces and urine is among other symptoms of bilharzia as this occurs when the parasite enters the intestine or urinary bladder. On the other hand, those who chose *A, Gonorrhoea*, and *B, Cholera* failed to understand that gonorrhoea is characterised by painful urination and foul yellow discharge from the penis or vagina while cholera is characterised by watery diarrhoea like rice water and vomiting. Similarly, those who opted for *D, Malaria*, were not aware that malaria is characterised by pain in joints, periodic fever, nausea and vomiting, chills and headache.

Item (iv) *A mother went to hospital with her baby complaining of the baby's high body temperature. Which instrument will be used to examine the baby?*

- | | | | |
|----------|---------------------|----------|--------------------|
| <i>A</i> | <i>Beam balance</i> | <i>B</i> | <i>Thermometer</i> |
| <i>C</i> | <i>Stop watch</i> | <i>D</i> | <i>Stethoscope</i> |

The correct response was *B, Thermometer*. Students who chose *B, Thermometer* were aware of the uses of the instruments found in the Biology laboratory. They recognised that, thermometer is used for measuring temperature. Those who opted for *A, Beam balance*, and *C, Stop watch*, were not aware that beam balance is used for measuring weight while stop watch is used for measuring time. Similarly, those who chose alternative *D, Stethoscope*, did not realise that stethoscope is a medical instrument used in listening to sounds produced within the body, mainly in the heart or lungs.

Item (v) *What happens during the process of taking air into the lungs of human being?*

- A* *Air is pushed out of the lungs*
- B* *The ribcage moves inwards*
- C* *The diaphragm contracts*
- D* *The diaphragm relaxes*

The correct response was *C, The diaphragm contracts*. Students who chose *C, The diaphragm contracts* were aware of gaseous exchange in mammals. Therefore, they understood that during inhalation diaphragm contracts to increase the volume of the thoracic cavity thus allowing air to enter the thoracic cavity. On the other hand, those who chose *A, Air is pushed out of the lungs*, *B, The ribcage moves inwards* and *D, The diaphragm relaxes* lacked the knowledge about the mechanism of gaseous exchange in mammals since all these alternatives are changes which occur during exhalation (taking air out of the lungs).

Item (vi), *Why is chlorophyll necessary for photosynthesis?*

- A* *Absorbs sunlight energy*
- B* *Splits water molecules*
- C* *Manufactures carbohydrates*
- D* *Transport water and minerals*

The correct answer was *A, Absorption of sunlight energy*. Students who chose the correct answer understood the conditions necessary for photosynthesis. Therefore, they were aware that chlorophyll is a green pigment in plants which absorbs sunlight energy for photosynthesis to take place. However, students who opted for *B, Splits water molecules* were not aware that it is the sunlight which splits water molecules. Those who chose *C, Manufactures carbohydrates* failed to understand that manufacture of carbohydrate is a process which does not only involve chlorophyll, but also, carbon dioxide, water and sunlight to accomplish the process. Likewise, those who chose *D, Transport water and minerals* did not understand that water and minerals are transported in xylem tissue.

Item (vii), *Which practice would you recommend to control cancer disease?*

- A Having frequent blood transfusion*
- B Doing regular physical exercises*
- C Taking enough fibres everyday*
- D Using chemo and physical therapy*

The correct answer was *D, Using chemo and physical therapy*. Students who opted for alternative *D, Using chemo and physical therapy* had adequate knowledge about control of non-communicable diseases including cancer. On the other hand, those who opted for alternative *A, Having frequent blood transfusion* and *B, Doing regular physical exercises* did not understand that frequent blood transfusion is used to control sickle cell anaemia while doing regular physical exercises prevents and controls diseases like diabetes, hypertension and other coronary diseases. Likewise, those who chose *C, Taking enough fibres everyday*, failed to understand that this prevents constipation.

Item (viii), *Which of the following characteristics applies to members of Kingdom Plantae?*

- (i) They have cell wall made up of chitin*
 - (ii) They feed on dead and decaying organic matter*
 - (iii) They have cell wall made up of cellulose*
 - (iv) They have membrane bound nucleus*
- | | |
|-------------------------|------------------------|
| <i>A (iii) and (iv)</i> | <i>B (i) and (ii)</i> |
| <i>C (i) and (iv)</i> | <i>D (ii) and (iv)</i> |

The correct response for this item was *A, (iii) and (iv)*. The students who correctly responded to this item demonstrated understanding of the characteristic features of members of Kingdom Plantae. On the other hand, those who chose *B, (i) and (ii)*; *C, (i) and (iv) and D, (ii) and (iv)* failed to understand that although both fungi and plants have membrane bound nucleus but cell wall made up of chitin and feeding on dead and decaying organic matter are features found only in members of Kingdom Fungi.

Item (ix), *Which foods will you recommend to a child suffering from Kwashiorkor?*

- A Milk, groundnuts, beans and meat*
- B Milk, cassava, sorghum and wheat*
- C Cabbage, spinach, cassava and eggs*
- D Sorghum, cassava, rice and yams*

The correct alternative was *A, Milk, groundnuts, beans and meat*. Students who chose alternative *A, Milk, groundnuts, beans and meat* were aware that kwashiorkor is a nutritional disorder caused by deficiency of protein to children under five years. Therefore, the disorder can be treated by providing a child with diet that has adequate amount of protein. However, those who opted for *B, Milk, cassava, sorghum and wheat* and *C, Cabbage, spinach, cassava and eggs* did not recognise that although milk and eggs are protein foods but cassava, sorghum, wheat are sources of carbohydrates while cabbage and spinach are sources of vitamins and fibres. Furthermore, those who chose *D, Sorghum, cassava, rice and yams* were not aware that these are source of carbohydrates.

Item (x), *How do primary producers initiate energy flow in an ecosystem?*

- A Feeds on herbivores and release nutrients*
- B Converts sunlight energy into chemical energy*
- C Decompose organic matter and sets energy free*
- D Converts chemical energy into sunlight energy*

The correct response was *B, Converts sunlight energy into chemical energy*. Students who opted for correct response were aware that primary producers capture sunlight and convert it into chemical energy through photosynthesis thereby producing food. However, students who chose *A, Feeds on herbivores and release nutrients* did not recognise that herbivores are fed upon by secondary consumers such as lion and leopard. Those who chose alternative *C, Decompose organic matter and sets energy free* were not aware that this is

the role of decomposers such as bacteria and fungi. On the other hand, those who chose *D*, *Converts chemical energy into sunlight energy* were not aware that it is the energy from the sun which is converted into chemical energy by producers (green plants) and not the opposite.

2.1.2 Question 2: Matching Items

The question consisted of five (5) matching items set from the topic of Transport of Materials in Living Things. In this question, students were required to match functions of the blood vessels in List A with the corresponding blood vessels in List B by writing the letter of the correct response below the item number in a table provided. The list of items to match is shown in the following table:

<i>List A</i>	<i>List B</i>
(i) <i>Transports oxygenated blood from the lungs to the heart.</i>	A <i>Coronary artery</i> B <i>Superior vena cava</i>
(ii) <i>Carries blood containing waste materials away from the heart.</i>	C <i>Hepatic artery</i> D <i>Pulmonary artery</i>
(iii) <i>Transport deoxygenated blood from the heart to the lungs.</i>	E <i>Inferior vena cava</i> F <i>Renal vein</i>
(iv) <i>Transports deoxygenated blood from the lower parts of the body to the heart.</i>	G <i>Coronary vein</i> H <i>Pulmonary vein</i>
(v) <i>Transports deoxygenated blood from the upper parts of the body to the heart.</i>	

This question was attempted by all students 694,882 (100%). Among them, 449,535 (64.69%) scored from 0 to 1 marks out of whom, 276,437 (39.78%) scored 0. Students who scored from 2 to 3 marks were 165,234 (23.78%), whereas 80,113 (11.53%) scored from 4 to 5 marks, out of whom 35,279 (5.08%) scored all the 5 marks allocated to this question. Figure 2 summarizes the students' performance on question 2.

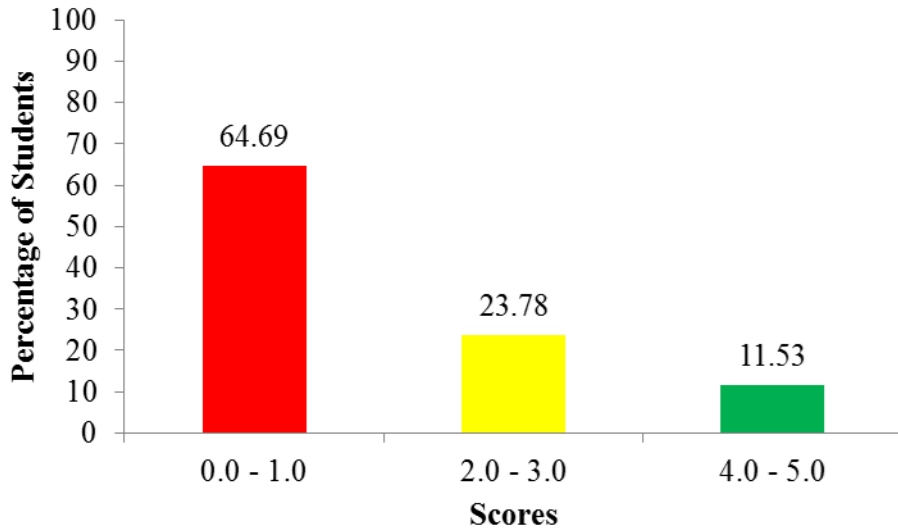


Figure 2: Students' performance on question 2

Figure 2 indicates that the general performance was average because 35.31 per cent of the students scored from 2 to 5 marks. The students who scored all marks had adequate knowledge about blood vessels. Extract 1.1 is a sample of students' correct responses.

Answer					
List A	(i)	(ii)	(iii)	(iv)	(v)
List B	H	G	D	E	B

Extract 1.1: Student's correct responses to question 2

In Extract 1.1, the student matched correctly the functions of blood vessels with their respective blood vessels, thus scored all the 5 marks allocated to this question.

On the other hand, students who scored low marks (0 - 1) either gave incorrect responses to all the items or gave correct response to only one item, hence lost some marks. The analysis of the students' responses in each item is presented as follows:

Item (i) required the students to identify the blood vessel that matches correctly with the statement *Transports oxygenated blood from the lungs to*

the heart. The correct answer was *H, Pulmonary vein*. Some of the students provided a correct response, signifying that they understood the function of the blood vessels. However, some students opted for other alternatives as they did not recognise the function of pulmonary vein.

Item (ii) required the students to identify the blood vessel that matches correctly with the statement *Carries blood containing waste materials away from the heart*. The correct response was *G, Coronary vein*. However, some students matched with *A, Coronary artery*. These students failed to understand that coronary vein supplies oxygenated blood to the heart muscles.

Item (iii) required the students to identify the blood vessel that matches correctly with the statement *Transport deoxygenated blood from the heart to the lungs*. The correct answer was *D, Pulmonary artery*. Students who matched it correctly, indicated that they had adequate knowledge about the function of pulmonary artery. Those who chose *C, Hepatic artery* failed to understand that hepatic artery carries oxygenated blood to the liver.

Item (iv) asked the students to identify the blood vessel that matches correctly with the statement *Transports deoxygenated blood from the lower parts of the body to the heart*. The correct answer was *E, Inferior vena cava*. However, some students opted for other alternatives. They did not understand that it is the inferior superior vena cava that transports deoxygenated blood from the lower parts of the body to the heart.

Item (v) required the students to identify the blood vessel that matches correctly with the statement. *Transports deoxygenated blood from the upper parts of the body to the heart*. The correct answer was *B, Superior vena cava*. Conversely, some students matched it with other alternatives. These students failed to understand the role of superior vena cava in the circulatory system. Extract 1.2 is a sample of students' incorrect responses.

Answer					
List A	(i)	(ii)	(iii)	(iv)	(v)
List B	D	A.	H	B	E

Extract 1.2: Student's incorrect responses to question 2

In Extract 1.2, the student failed to match all the items of the question. These responses suggests that the student had insufficient knowledge about blood circulation in human.

2.2 Section B: Short Answer Questions

This section consisted of seven (7) short answer questions, each carrying 10 marks.

2.2.1 Question 3: Health and Immunity

This question had two parts; (a) and (b). In part (a), the students were required to identify communicable and non-communicable diseases from a list of given diseases: Marasmus, Scurvy, Cholera, Tuberculosis, Pellagra, Leukaemia, Malaria and Syphilis. In part (b), they were required to state the ways of transmission of the identified communicable diseases.

The question was attempted by all students 694,882 (100%). The a nalysis shows that 454,192 (65.36%) scored from 0 to 2.5 marks, out of whom 152,615 (21.96%) scored 0 mark. The students who scored from 3 to 6 marks were 206,237 (29.68%), whereas 34,453 (4.96%) scored from 6.5 to 10 marks, out of whom 4,479 (0.64%) scored all the 10 marks. Figure 3 summarizes the students' performance on question 3.

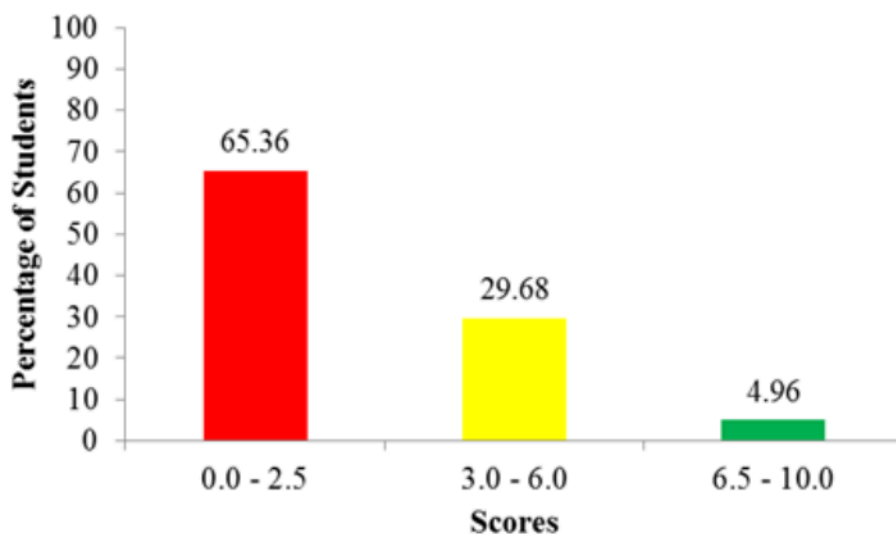


Figure 3: Students' performance on question 3

Based on Figure 3, the general performance was average because 34.64 per cent of the students scored from 3 to 10 marks. Students who scored high marks (6.5 - 10) had adequate knowledge about common infections and diseases. They were aware of the communicable diseases and that, can be transmitted from one person to another while non communicable diseases cannot be transmitted from one person to another. Therefore, they managed to identify most or all of the communicable and non communicable diseases from a mixed list in part (a). Also, they correctly stated the ways of transmission of most or all of the communicable diseases in part (b). This shows that the students had acquired adequate knowledge of infections and diseases particularly, on communicable and non-communicable diseases. Extract 2.1 is a sample of students' correct responses.

3.	(a)	Identify the communicable and non-communicable diseases from the following list: Marasmus, Scurvy, Cholera, Tuberculosis, Pellagra, Leukaemia, Malaria and Syphilis.
	(i)	Communicable diseases The communicable diseases are cholera, tuberculosis, malaria and syphilis.
	(ii)	Non communicable diseases The non communicable diseases are marasmus, scurvy, pellagra and leukaemia.
	(b)	How is each of the communicable disease sorted in (a) (i) transmitted? The communicable disease mentioned above can be transmitted by the following ways:- i) Malaria can be transmitted when female anopholes mosquito takes blood from infected person to health person. ii) Cholera can be transmitted through eating or drinking contaminated food and water. iii) Tuberculosis can be transmitted through air droplets when an infected person coughs or sneezes to a healthy person. iv) Syphilis can be transmitted through sexual intercourse when a person with syphilis mates with a healthy person.

Extract 2.1: Student's correct responses to question 3

In Extract 2.1, the student correctly identified communicable diseases as well as non-communicable diseases in part (a). Also, in part (b) he/she correctly stated the ways of transmission of the communicable disease identified in part (a).

On the other hand, students who scored low marks (0 - 2.5) either gave incorrect responses to all parts of the question or to some parts, hence obtained 0 to 2.5 marks. In part (a), most of the students confused the concepts as they interchanged or mixed the two by writing communicable diseases instead of non communicable diseases and vice versa. For example, some students identified *pellagra*, *leukaemia* and *scurvy* as communicable diseases while *malaria*, *syphilis* and *tuberculosis* were identified as non-communicable diseases. Others listed communicable and non communicable diseases other than those given in the list. Moreover, there were other students who copied all the diseases and wrote them as communicable as well as non communicable diseases. This signify that they were incompetent of the classification of diseases based on communicable and non communicable nature.

In part (b), some students wrote ways of transmission of other diseases. For, instance some wrote *cholera is transmitted by droplets infection; syphilis is transmitted by water snail and tuberculosis is transmitted by contaminated food*. Others wrote ways of preventing the diseases instead of how the diseases are transmitted. For example, some students wrote *tuberculosis is transmitted through covering nose and mouth; cholera is transmtted through washing hands after visiting toilets and syphilis is transmitted by abstaining from sex*. Furthermore, other students wrote *cholera is transmitted through fleas* instead of contaminated water, or food. *Malaria is transmitted by culex mosquitoes* instead of female anopheles mosquitoes. *Syphilis is transmitted through sharing clothes* and *tuberculosis is transmitted by tsetsefly*. There were other students who categorised the communicable diseases into endemic and pandemic as such they wrote *HIV/AIDS and COVID -19 are pandemic diseases* while *malaria and syphilis are endemic diseases*. Additionally, some students stated the symptoms of the diseases. For example, *malaria has fever and headache, Syphilis has rashes and painless sores, Tuberculosis has prolonged cough and fever*. This implies that these students had inadequate knowledge about of mode of transmission of common infections and diseases. Extract 2.2 is a sample of students' incorrect responses.

3. (a) Identify the communicable and non-communicable diseases from the following list: Marasmus, Scurvy, Cholera, Tuberculosis, Pellagra, Leukaemia, Malaria and Syphilis.

(i) Communicable diseases
 Are those disease that can cause harm to people or transmitted from one people to another

(ii) Non communicable diseases
 Are those disease, that cannot cause harm to people or can not transmitted from one people to another.

(b) How is each of the communicable disease sorted in (a) (i) transmitted?

i) Epidemic disease, transmitted from one person to another

ii) Endemic disease, transmitted from one region to another

iii) Pandemic disease, transmitted at large area

Extract 2.2: Student’s incorrect responses to question 3

In Extract 2.2, the student defined communicable and non communicable diseases instead of identifying the communicable and non communicable diseases from the list given in part (a). Also, he/she incorrectly placed categories of communicable diseases such as *epidemic* and *endemic* instead of explaining the ways through which the communicable diseases are transmitted.

2.2.2 Question 4: Introduction to Biology

This question had a scenario stating “Form Two students were asked to observe sections of plant cells using a light microscope.” Then the students were required to explain the need of using a light microscope in observing sections of plant cells in part (a). In part (b), they were required to draw a diagram of a light microscope and label seven parts.

This question was attempted by all students 694,882 (100%). The analysis indicates that 381,654 (54.92%) scored from 0 to 2.5 marks, out of whom, 264,021 (38.00%) scored 0. Students who scored from 3 to 6 marks were 170,757 (24.58%), whereas 142,471 (20.50%) scored from 6.5 to 10 marks, out of whom 18,819 (2.71%) scored all the 10 marks. Figure 4 summarizes the students’ performance on question 4.

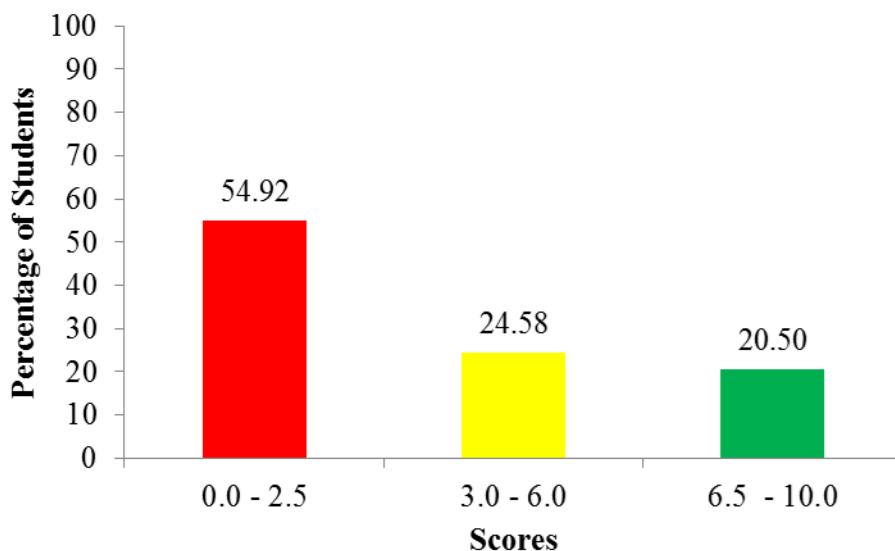


Figure 4: *Students' performance on question 4*

In view of Figure 4, students' performance on this question was average because 45.08 per cent of the students scored from 3 to 10 marks. Students who scored high marks (6.5 - 10) had adequate knowledge of common apparatuses and equipments of Biology laboratory. In addition, they were skillfull in biological drawing. Therefore, they drew a diagram of a light microscope by observing the principles of biological drawing such as use of pencil, large diagram, neatness, drawing in sharp lines, use of non-arrowed label lines, parallel/non crossing labelling lines, free hand drawing and relevant caption. Extract 3.1 is a sample of students' correct responses.

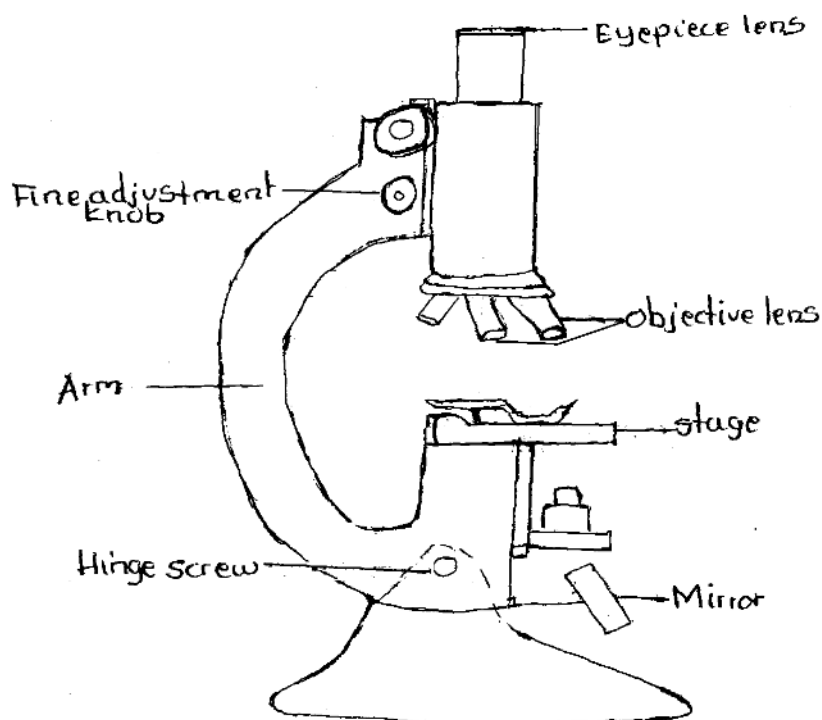
4. Form Two students were asked to observe sections of plant cells using a light microscope.

(a) Why was it necessary to use such an instrument?

This is because the plant cell is very small such that we cannot see it by our naked eyes, therefore they used light microscope in order to magnify the plant cell for easy observation.

(b) Draw a diagram of a light microscope and label the seven parts.

DIAGRAM OF A LIGHT MICROSCOPE



Extract 3.1: Student's correct responses to question 4

In Extract 3.1, the student gave correct reason for using light microscope in observation of the sections of plant cells in part (a). Also, he/she drew and labeled correctly a diagram of a light microscope in part (b).

Despite the average performance on this question, 381,654 (54.92%) students scored 0 - 2.5 marks. These students provided incorrect responses in most or all parts. Some of them either gave incorrect reason for using light microscope in part (a) or they drew a correct diagram with incorrect labels in part (b). For example, in part (a) some students wrote the uses of other apparatuses such as *it is used to put specimen for observation; used to*

store test tubes; to illuminate the objects and used during experiments that involve colour. Other incorrect responses observed in students' scripts were *light microscope is used by students and teachers to study its parts; Microscope is used to view distant objects and microscope is used by scientists in studying specimens*. These students were not aware that the light microscope is used to magnify small object (specimen) so that it can be seen clearly.

In part (b), some of the students drew the light microscope with incorrect labels while others misspelt the labels hence lost marks. For example, the misspelt lables include *diagram* instead of diaphragm, *crisp* instead of clip and *mira* instead of mirror. Moreover, others failed to draw the diagram of the light microscope, as such, they drew diagrams of other apparatuses. For example, some students drew diagrams of bunsen burner, hand lens, test tube rack and white tile instead of a light microscope. Extract 3.2 is a sample of student's incorrect responses.

4. Form Two students were asked to observe sections of plant cells using a light microscope.

(a) Why was it necessary to use such an instrument?
Because if you do an you instrument we can see that some parts of plant cell

(b) Draw a diagram of a light microscope and label the seven parts.

Extract 3.2: Student's incorrect responses to question 4

In Extract 3.2, the student drew a diagram of plant cell instead of a light microscope in part (b). Also he/she gave incorrect reason for using light microscope in observing the sections of plant cells in part (a).

2.2.3 Question 5: Cell Structure and Organisation

The question had parts (a) and (b). In part (a), students were required to give the four key differences between plant cell and animal cell while in part (b), they were required to explain what would happen if the cell membrane was severely damaged.

The question was attempted by all students 694,882 (100%). The analysis indicates that 377,098 (54.27%) scored from 0 to 2.5 marks, out of whom, 249,010 (35.83%) scored 0. Students who scored from 3 to 6 marks were 212,279 (30.55%) whereas 105,505 (15.18%) scored from 6.5 to 10 marks, out of whom 29,393 (4.23%) scored all the 10 marks. Figure 5 summarizes the students' performance on question 5.

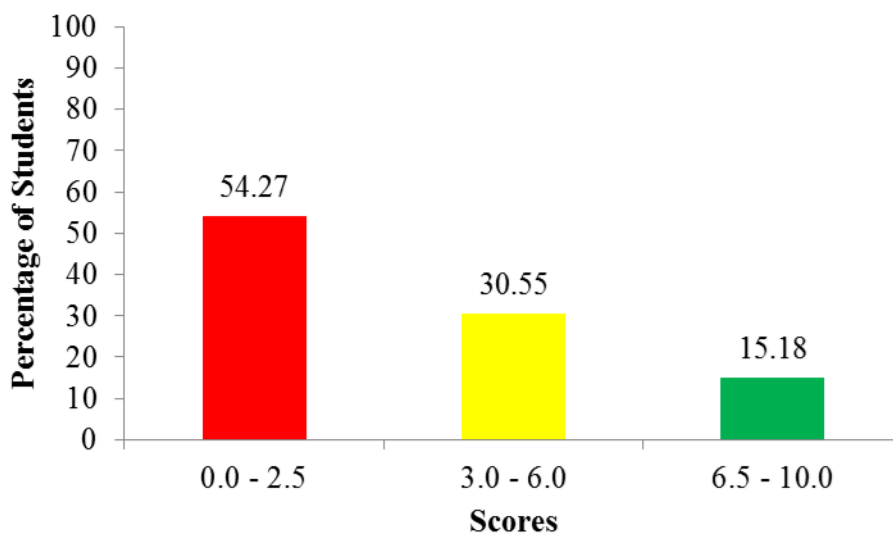


Figure 5: *Students' performance on question 5*

Figure 5, shows that students' performance on question 5 was average because 45.73 per cent of the students scored from 3 to 10 marks. Students who scored high marks (6.5 - 10 marks) gave correct differences between plants and animal cells in part (a). They also gave correct explanation about what would happen if the cell membrane was severely damaged. This

implies that the students had sufficient knowledge about plant and animal cells. Extract 4.1 is a sample of students' correct responses.

5. (a) How does a plant cell differ from an animal cell? Give four key points.

	Plant cell	Animal cell
(i)	Has a large and permanent vacuole	Has a small and temporary vacuole
(ii)	The nucleus is located at the periphery	The nucleus is located at the centre
(iii)	Stores food in form of starch	Stores food in form of glycogen
(iv)	Have chloroplasts	Does not have chloroplasts

(b) What will happen if the cell membrane is severely damaged?
 If the cell membrane is severely damaged the materials will move in and out of the cell without any control

Extract 4.1: Student's correct responses to question 5

In Extract 4.1, the student correctly gave the differences between plant and animals cell in part (a) while in part (b), he/she gave a correct explanation about what would happen if the cell membrane is severely damaged.

However, analysis shows that 377,098 (54.27%) students scored low (0 - 2.5) marks. These students demonstrated inadequate knowledge of the plant and animal cells. Some of those who scored zero drew plant and animal cells. Others had correct differences between plant and animal cells but wrote them interchangeably. Examples of such responses were *plant cells have no cell wall while animal cells have cell wall; Plant cells have no chloroplasts while animal cells have chloroplasts* and *Plant cell has irregular shape while animal cell has regular shape*. Other students could

not differentiate plant from animal cell, instead they wrote features and organelles present in the cells. For instance, some wrote *plant cell has cell wall while animal cell has cytoplasm, plant cell has chloroplast while animal cell has vacuole and plant cell stores food as starch while animal cell has irregular shape* while others left the gaps. Additionally, some students regarded plant cell and animal cell as prokaryotic and eukaryotic cells, so they gave differences between prokaryotic and eukaryotic cells such as *plant cell have membrane bound nucleus while animal cell lacks membrane bound nucleus, plant cell is found in multicellular organisms while animal cell is found in unicellular organisms and plant cell have membrane bound organelles while animal cell do not have membrane bound organelles*. Moreover, others just listed examples of organs and tissues found in the human body instead of giving the differences between plant and animal cell.

Likewise, in part (b), some students provided incorrect explanation. Some of them explained the effects of damaging other parts of cell instead of cell membrane. For example some of them wrote *There would be no control of the activities of other parts of the cell, the cell would be weak as there would be no production of energy, the cell will lack a definite shape and photosynthesis would stop as there would not be green pigment*. These responses suggest that the students had insufficient knowledge about the function of organelles in plant and animal cells. Extract 4.2 is a sample of students' incorrect responses.

5. (a) How does a plant cell differ from an animal cell? Give four key points.

	Plant cell	Animal cell
(i)	They have no nucleus cell	They have nucleus cell
(ii)	They do not have cell wall membrane	They have cell wall membrane
(iii)	They have cytoplasm	They have cytoplasm
(iv)	They have cell wall	They have cell wall

(b) What will happen if the cell membrane is severely damaged?
 Cell membrane is help plant and animal cell, to removal waste

Extract 4.2: Student’s incorrect responses to question 5

In Extract 4.2, the student incorrectly wrote comparison between animal and plant cells. For example he/she wrote *plant cell have no nucleus while animal cell have nucleus*. These responses signify that the student failed to understand the question demand. Also the responses given in part (b) was incorrect.

2.2.4 Question 6: Nutrition

This question had a scenario which stated that, “Your community requested you to educate them about modern methods of preserving its milk, meat, tomatoes, mangoes and vegetables.” Then the students were required to explain the four modern methods for preserving such products.

The analysis revealed that all students 694,882 (100%) responded to this question. Among them, 596,147 (85.79%) scored from 0 to 2.5 marks, out of whom 439,704 (63.28%) scored 0 mark. The students who scored from 3 to 6 marks were 73,637 (10.60%), whereas, 25,098 (3.61%) scored from

6.5 to 10 marks, out of whom 8,214 (1.18%) scored all the 10 marks. Figure 6 summarizes the students' performance on question 6.

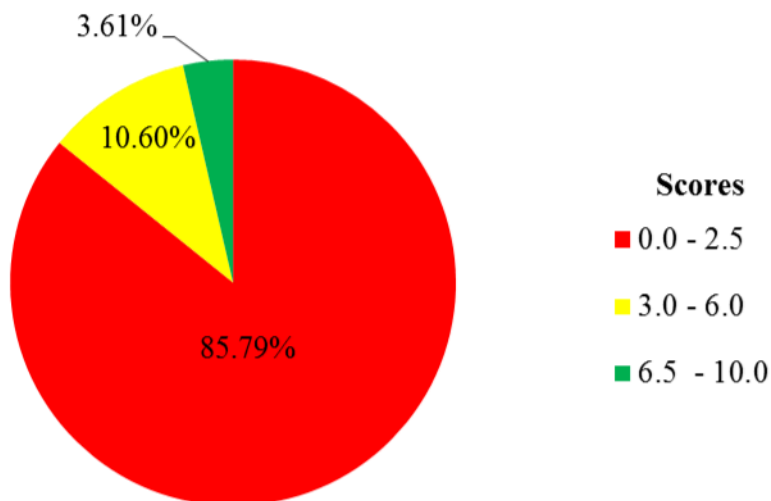


Figure 6: Students' performance on question 6

Figure 6 indicates that the students' performance on this question was weak since the majority 596,147 (85.79%) scored from 0 to 2.5 out of 10 marks. Those students who scored 2.5 marks correctly explained one modern method for preserving food. Others correctly mentioned one to two methods but failed to explain it hence loss of marks. For 439,704 (63.28%) students who scored zero marks were not knowledgeable about methods of food processing, preservation and storage. These students gave incorrect responses. Some of them wrote traditional method of food preservation such as *salting, smoking, boiling, roasting, cooking and drying in the sun.* Others mixed both modern and traditional methods of food preservation. Furthermore, some students mentioned types of food substances such as *proteins, vitamins, carbohydrates and fats* instead of explaining the modern methods of food preservation. Also, some of the students listed different foods such as *fish, oranges, rice, banana, water melon and green vegetables* instead of explaining the modern methods of food preservation. Others mentioned utensils for keeping food in the kitchen. For example, one student wrote *milk put in a gallon, meat in a bucket, tomatoes in a basket, mangoes in a pot and vegetables put in a basin.* There were also other students who wrote advantages and disadvantages of the modern

methods such as *the method is expensive, it requires advanced technology,* and *the food can stay for a long time* instead of explaining the modern methods of food preservation. Extract 5.1 is a sample of the students' incorrect responses to question 6.

6. Your community requested you to educate them about modern methods of preserving its milk, meat, tomatoes, mangoes and vegetables. Briefly explain to them four methods for preserving such products.

(i) It help to get energy
That food which are provided can help to make good quality in the body and so cause to promoted the good health which can help to get power of doing anything that can be working.

(ii) It help to prevent diseases, like kwashiorkor
That disease affect many people but necessary to young children many children who can not form good quality of observed food can get many problem to her body the stomach to be big hands and leg to be small that can be provided in the body.

(iii) It help to prevent stomach problem and to move the gases in the stomach
many people having the problem of having gases in the stomach and bacteria but they can drink milk and can eat fruits that problem can be solved.

(iv) It help in vitamin C
People can get the fungus in the mouth because of lack of vitamin so many people, children, grand parents avoid eating fruits and many food for good better for her health.

Extract 5.1: Student's incorrect responses to question 6

In Extract 5.1, the student explained the function of foods. For example, *it help to get energy and vitamins* instead of explaining the modern methods of food preservation.

Conversely, 25,098 (3.61%) students who scored from 6.5 to 10 marks demonstrated their understanding of various methods of food processing, preservation and storage. They were able to explain most or all modern methods of food preservation such as liquefaction, pasteurisation, refrigeration, freezing, canning and bottling, additives and irradiation. Extract 5.2 is a sample of the students' correct responses.

6. Your community requested you to educate them about modern methods of preserving its milk, meat, tomatoes, mangoes and vegetables. Briefly explain to them four methods for preserving such products.
- (i) **Pasteurisation:** This is the method which involves heating food to moderate temperature, usually less than 100°C. This method helps to sterilise the products preserved, as well as slow down the growth of microorganisms and to avoid loss of nutrients in the products preserved. Examples of the products stored include milk.
 - (ii) **Liquefaction:** This is the production of liquid from solid foods. This method is mostly applied to fruits in making juices. It involves squeezing and blending the fruits such as mangoes to make juice so as to preserve in a liquid form. Examples of the products preserved include mangoes and sometimes tomatoes.
 - (iii) **Using additives:** This method involves using chemicals as additives such as sodium benzoate, acid and sodium chloride in preserving food. The chemicals are used, so as to add flavour to the food and to stop the growth of microorganisms. Examples of food preserved includes meat.
 - (iv) **Irradiation:** This method involves the use of energy rays, such as gamma rays in preserving the food. The use of the energy rays tend to stop the growth of microorganisms in the food. Examples of the food preserved include tomatoes and vegetables.

Extract 5.2: Student's correct responses to question 6

In Extract 5.2, the student explained correctly the modern methods of preserving the foods. For example he/she wrote *liquefaction the method used to produce liquids from solids*.

2.2.5 Question 7: Safety in our Environment

This question consisted of parts (a) and (b). In part (a), students were required to identify four components found in the First Aid kit and state the use of each. In part (b), they were required to outline four procedures to be followed when giving First Aid to a person with the problem of nose bleeding.

The analysis shows that all students 694882 (100%) responded to this question. Among these 263,007 (37.85 %) scored from 0 to 2.5 marks out of whom 108,483 (15.61%) scored 0. The students who scored from 3 to 6 marks were 300,798 (43.29%) and 131,077 (18.86%) scored from 6.5 to 10 marks, out of whom 2,779 (0.40%) scored 10 marks on this question, as shown in Figure 7.

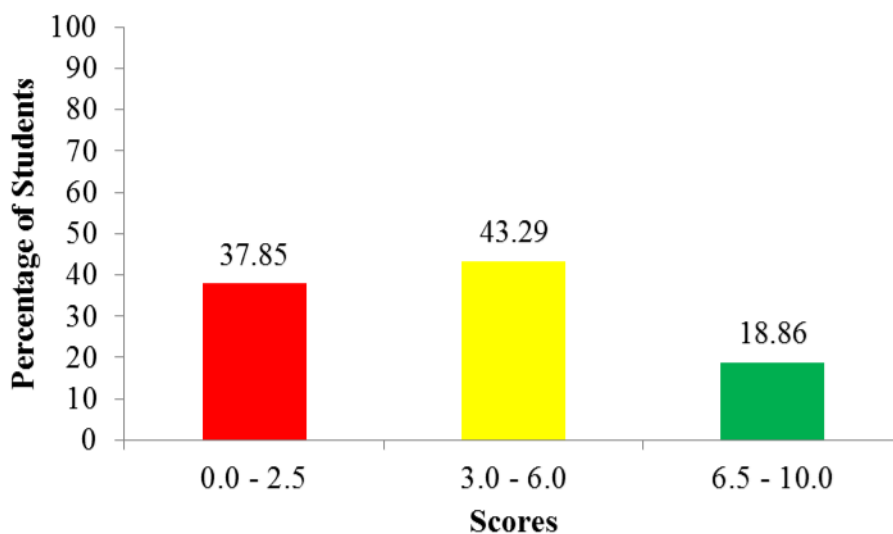


Figure 7: Students' performance on question 7

As Figure 7 demonstrates, the general performance on this question was average because 62.15 per cent of the students scored from 3 to 10 marks. Students who scored high (6.5 - 10) marks correctly identified most or all the components of the First Aid kit and stated their uses in part (a). In part (b), most of the students were able to outline the procedures for giving First

Aid to a victim of nose bleeding. This shows that, the students were competent on the components of the First Aid kit and procedures of giving First Aid to various victims. Extract 6.1 is a sample of students' correct responses.

7.	(a)	Identify four components found in the First Aid kit and state the use of each one.
	(i)	Bandage : is used for immobilizing injured limbs and keeping dressing materials in place.
	(ii)	Cotton wool : is used for cleaning dirty wounds and drying them.
	(iii)	Liniment is used for reducing muscle pain.
	(iv)	A pair of scissors is used for cutting dressing materials.
	(b)	Outline four procedures you will follow to give the First Aid to a person with the problem of nose bleeding.
	(i)	Make a person to sit upright with his head tipped slightly forward.
	(ii)	Ask the victim to pinch his nose for some minutes.
	(iii)	Ask the victim to breathe through the mouth.
	(iv)	If bleeding stops then help him to wash the drops of blood but if bleeding continues take him to hospital.

Extract 6.1: Student's correct responses to question 7

In Extract 6.1, the student correctly identified the components of the First Aid kit and stated their use in part (a). Also he/she correctly outlined the procedures to be followed when giving First Aid to a victim of nose bleeding in part (b).

Despite the average performance on this question, 263,007 (37.85%) students scored 0 - 2.5 marks. These students either did not understand the demands of the question or they lacked knowledge of the tested concepts, thus provided incorrect responses. Some of them either identified the components of First Aid kit correctly but failed to state their uses or

outlined few components of First Aid kit in part (a). Some of the students who scored 0 marks, explained the importance of First Aid instead of the use of components of the First Aid kit. For instance, some students wrote *it saves life, reduce pain, removes fear of death and it brings hope*. Others mentioned apparatuses used in the Biology laboratory such as *Bunsen burner, beaker, test tube and spatula*.

Similarly, in part (b), some of the students outlined the procedures for giving First Aid to different victims. For example, some students mentioned situations which need First Aid service such as *snake bite, bruises, vomiting, insect bite and electric shock*. Moreover, some students outlined the components of First Aid kit instead of outlining the procedures for giving first aid to a victim of nose bleeding. This indicates that they had inadequate knowledge about procedures of giving First Aid to various victims. Extract 6.2 is a sample of student's incorrect responses to question 7.

7. (b) Outline four procedures you will follow to give the First Aid to a person with the problem of nose bleeding.
- (i) Take the person to well ventilated area where there is enough oxygen gas.
 - (ii) let him/her breathe through the nose and the not the mouth.
 - (iii) Make sure that his/her leg is raised high up so as to ~~be~~ make sure that blood is not getting out.
 - (iv) Give him some rest and check for any improvement later on.

Extract 6.2: Student's incorrect responses to question 7(b)

In Extract 6.2, the student outlined the procedures of giving First Aid to a person who has fainted instead of the procedures for giving First Aid to a victim of nose bleeding.

2.2.6 Question 8: Classification of Living Things

The question had parts (a) and (b). In part (a), students were required to state two phyla of the Kingdom Fungi while in part (b), they were required

to justify the statement that ‘‘Fungi are important organisms to the human being. ’’

The question was attempted by all students 694,882 (100%). The analysis indicates that 406,735 (58.53%) scored from 0 to 2.5 marks, out of whom, 258,847 (37.25%) scored 0. Students who scored from 3 to 6 marks were 179,839 (25.88%) whereas 108,308 (15.59%) scored from 6.5 to 10 marks, out of whom 33,605 (4.84%) scored all the 10 marks. Figure 8 summarizes the students’ performance on question 8.

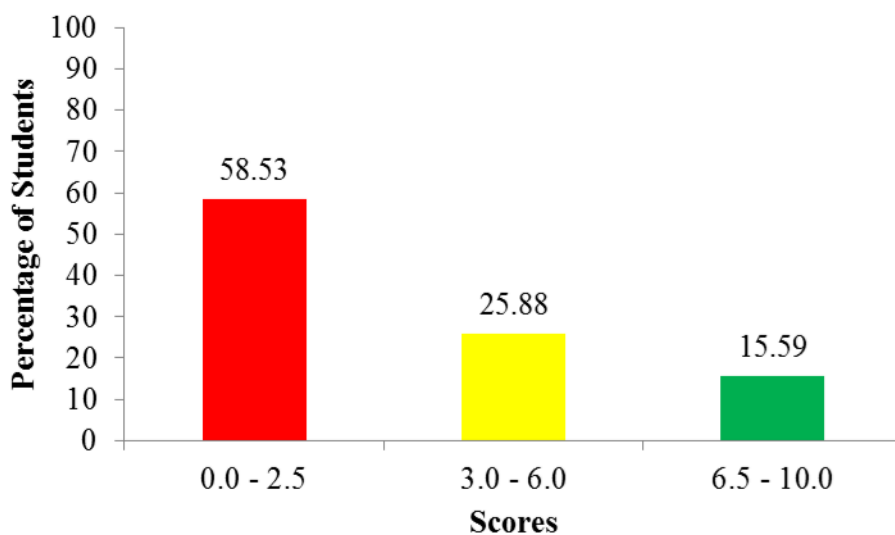


Figure 8: *Students’ performance on question 8*

Figure 8 indicates that the general performance on this question was average because 41.47 per cent of the students scored from 3 to 10 marks. Students who scored high marks (6.5- 10) stated correctly all the two phyla of the Kingdom Fungi in part (a). Also, in part (b) they justified the statement that fungi are important to the human being. This implies that they were aware of Kingdom Fungi. Extract 7.1 is a sample of students’ correct responses.

8. (a) State two Phyla of the Kingdom Fungi.
- ① Phylum Zygomycota
 ② Phylum Basidiomycota
- (b) "Fungi are important organisms to human being." By using four points, justify this statement
- (i) Used as source of food. Some of Fungi are used as a source of food for human being such as Mushroom. Mushrooms used as source of food because it contains high amount of vitamins and proteins.
- (ii) Used in production of antibiotics. Some of Fungi are used in production of antibiotics such as penicillium used to produce a penicillin which are used in treat ment of various bacteria diseases.
- (iii) Some of Fungi like yeasts are used in industry in the process of fermentation in the production of alcohols which can be used by the human as a drink.
- (iv) Fungi are the decomposer due to the character of fungi to be a decomposer they are used in decomposing various organic matter to increase the soil fertility in order for crops planted to grow well.

Extract 7.1: Student's correct responses to question 8

In Extract 7.1, the student stated correctly the two phyla of the Kingdom Fungi in part (a) and justified the importance of fungi to human being in part (b).

However, 58.53 per cent of the students scored low (0 to 2.5) marks. These students either gave incorrect phyla of the Kingdom Fungi in part (a) or gave incorrect justification in part (b). Some of them wrote the divisions of Kingdom Plantae such as *Pteridophyta* and *Bryophyta* while others wrote the major groups of living organisms as *Kingdom Monera* and *Kingdom Plantae* instead of the phyla of Kingdom Fungi. Others had correct phyla of Kingdom Fungi but wrote incorrect spelling like *Asycomycota* instead of *Ascomycota*, *Basidimycota* instead of *Basidiomycota* and *Zycomycoter*

instead of Zygomycota hence loss of marks. There were other students who gave the ranks of classification. For instance some students wrote *kingdom* and *class* while others wrote *phylum* and *species*. Additionally, other students wrote members of the phyla of kingdom fungi such as *yeast* and *mushroom* instead of the phyla of Kingdom Fungi. Lack of knowledge and misspelling of scientific words led to loss of marks.

In part (b), some students wrote disadvantages of fungi instead of justifying its importance to human being. For instance one student wrote *they cause diseases in plants and animals; they cause food spoilage; fungi produce toxins called aflatoxins and destroy property*. Others drew mushrooms and yeasts instead of the importance of fungi to human being. The incorrect responses indicate that students had inadequate knowledge about the advantages of organisms in Kingdom Fungi. Extract 7.2 is a sample of student's incorrect responses.

8. (b)	"Fungi are important organisms to human being." By using four points, justify this statement.
(i) they are eukaryotic
(ii) they have cell wall made up of chitin
(iii) they are heterotrophy
(iv) they have no chlorophyll

Extract 7.2: Student's incorrect responses to question 8(b)

In Extract 7.2, the student outlined characteristics of Kingdom Fungi such as *they are eukaryotic* instead of justifying the importance of Fungi to human being.

2.2.7 Question 9: Transport of Materials in Living Things

The students were given a statement: "Two people have been severely injured in a car accident, leading to excessive bleeding hence requiring blood transfusion." Then students were required to suggest precautions to

be considered before carrying out blood transfusion in part (a) and explain the importance of blood transfusion to the severely injured individuals in part (b).

The question was attempted by all students 694,882 (100%). Data show that 585,757 (84.30%) scored from 0 to 2.5 marks, out of whom 505,416 (72.73%) scored 0 marks. The students who scored from 3 to 6 marks were 91,030 (13.10%), whereas 18,095 (2.60%) scored from 6.5 to 10 marks, out of whom 5,108 (0.74%) scored all the 10 marks, as shown in Figure 9.

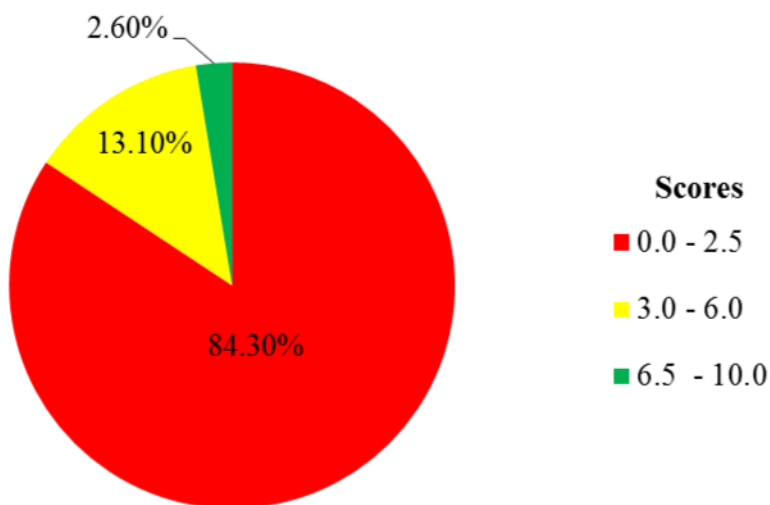


Figure 9: Students' performance on question 9

Figure 9 illustrates that students' performance on this question was weak since majority (84.30%) of the students scored 0 to 2.5 marks, out of the 10 marks allocated to this question. The students who scored low marks (0 - 2.5) lacked sufficient knowledge of blood groups and blood transfusion as most of them gave responses which were contrary to the demand of the question. In part (a), some students wrote precautions to be taken to avoid road accidents like *drivers must obey road signs, drivers must be 18 years and above, drivers must have no stress*. Others stated the functions of blood like *transport of gases and food, transport of hormones, distribute heat and transport waste products*. There were other students who wrote components of blood and their function like *red blood cell, white blood cell, platelets and plasma* instead of the precautions to be considered before

carrying out blood transfusion. Moreover, some students wrote types of accidents such as *electric shock, poisoning, drowning and fall* instead of precautions to be taken during blood transfusion. Additionally, some of them stated the requirements for blood donation like *measuring weight of a person, donor should be given glucose after donation, donor must be healthy and the age of the donor should be 18 years and above.*

Similarly, in part (b), most of the students failed to give a reason as to why blood transfusion is important to individuals who are involved in accident. Some of the students wrote types of blood groups such as, *blood group A, blood group B, blood group AB and blood group O.* Others explained the importance of blood circulation such as “*it ensures transport of materials, it transports oxygen, it ensures removal of carbon dioxide*” instead of importance of blood transfusion to the victims of accident. Extract 8.1 is a sample of students’ incorrect responses.

9. Two people have been severely injured in a car accident, leading to excessive bleeding hence requiring blood transfusion.
- (a) Suggest four precautions to be considered before carrying out this process.
- (i) Don't cut any area of a victim.
If you cut can cause other parts a victim and can get large injury.
- (ii) Wear a glove during take a given victim first aid.
Because to prevent infection to transfer from a victim to the first aider and Central diseases.
- (iii) Reduce blood for ~~cut~~ cotton or clothes.
Because we reduce for further bleeding can cause for loose of clot of blood.
- (iv) Go to hospital for medical help.
Because can dressed well and can get other medical help.
- (b) Why is blood transfusion important for these individuals? Give a reason.
- Because it use to repair dead cell and to increase number of cell in human body.

Extract 8.1: Student's incorrect responses to question 9

In Extract 8.1, the student stated the precautions to consider when giving First Aid to an injured person instead of precautions to be considered before carrying out blood transfusion in part (a). Also, he/she wrote the function of protein such as *repair dead cells* instead of the importance of blood transfusion to the accident victims in part (b).

Most of the students who scored high marks (6.5 to 10) correctly suggested most or all precautions to be considered before carrying out blood transfusion in part (a). They were aware that before blood transfusion, the blood must be checked for compatibility with the blood of the recipients in terms of ABO blood groups and the Rhesus factor to avoid agglutination.

Also, the donor's blood must be checked for its expire date and screened for pathogens of diseases like HIV/AIDS and Hepatitis.

In part (b), the students correctly explained the importance of blood transfusion to the severely injured persons in a car accident such as ensuring rapid replacement of the lost blood so as to save life. This shows that, they had adequate knowledge about blood groups and blood transfusion. Extract 8.2 is a sample of students' correct responses.

9.	Two people have been severely injured in a car accident, leading to excessive bleeding hence requiring blood transfusion.
(a)	Suggest four precautions to be considered before carrying out this process.
(i)	Screening of blood should be done in order to ensure or check if the blood has any pathogens such as viruses which can also affect the recipient's blood.
(ii)	Check if the blood going to be transfused to the victim matches or mixes with the victim's blood in order to avoid agglutination of blood which can lead to death.
(iii)	The blood going to be transfused should have not stay more than 21 days. The blood kept for more than the required days can lead to effects because it is not fresh.
(iv)	The blood going to be transfused should have been kept in special bags and refrigerated. If not, it is not safe for transfusion for it can lead to infections.
(b)	Why is blood transfusion important for these individuals? Give a reason.
	Blood transfusion is important because it reduces the risk of death caused by losing of excess blood thus it saves life.

Extract 8.2: Student's correct responses to question 9

In Extract 8.2, the student correctly suggested the precautions to be considered before carrying out blood transfusion in part (a) and correctly

explained the importance of blood transfusion to the severely injured individuals, in part (b).

2.3 Section C: Essay Question

This section consisted of one (1) essay question, carrying 15 marks.

2.3.1 Question 10: Health and Immunity

In this question, students were required to justify the statement that “Caring and supporting people living with HIV/AIDS is essential for them to live healthy lives.”

The analysis shows that all students 694,882 (100%) responded to this question. Among these, 584,917 (84.18%) scored from 0 to 4 marks out of whom, 458,942 (66.05%) scored 0 marks. Students who scored from 4.5 to 9 marks were 60,395 (8.69%), whereas 49,570 (7.13%) scored from 9.5 to 15 marks, out of whom 9,225 (1.33%) scored all the 15 marks. Figure 10 summarizes the students’ performance on question 10.

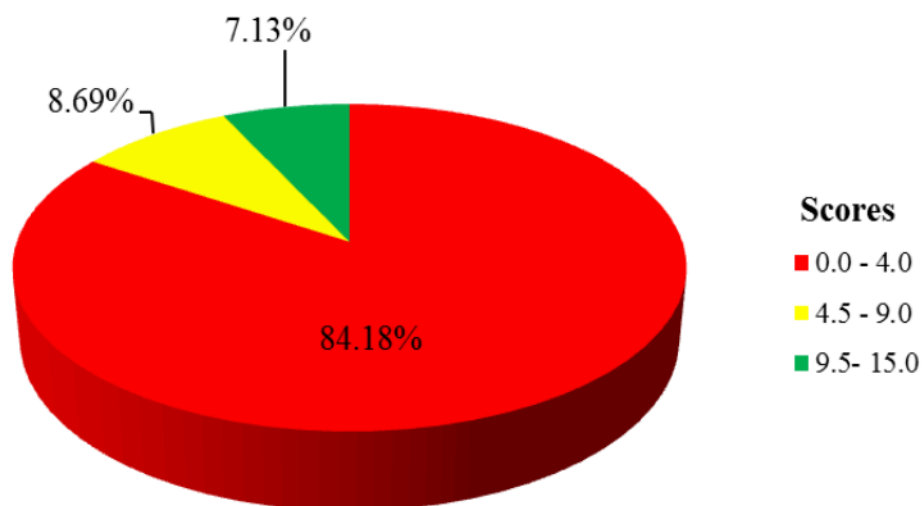


Figure 10: *Students’ performance on question 10*

The data indicated in Figure 10 show that the students’ performance was weak because majority (84.18%) scored from 0 to 4 out of the 15 marks allocated to this question.

The students who scored low (0 - 4) marks had inadequate knowledge of care and support for people living with HIV and AIDS (PLWHA). Some of the students who scored 1 to 4 marks provided correct introduction and outlined few importance of caring and support to PLWHA. Others provided introduction only or listed the importance instead of explaining it, hence scored low marks. For instance, some students wrote *HIV is a disease* instead of a virus; others wrote the long form of HIV as *Acquired immunodeficiency syndrome; Human Immuno Virus and Human Immunity Virus* and AIDS as *Human Immunodeficiency Virus*. The students who scored 0 marks either did not understand the demands of the question, or they lacked knowledge of the tested concepts, thus provided incorrect responses.

Furthermore, these students failed to justify the importance of care and support of PLWHA instead they stated ways of care and support of PLWHA. For instance, some wrote *Give the patient extra fluid to drink, keep wounds covered, offer financial support and wash the patient after visiting toilets*. Others wrote measures of preventing HIV/AIDS such as *use of condoms, abstain from sex and avoid having many sexual partners* while others stated factors affectecting immunity such *poor nutrition, lack of vaccination, incomplete treatment and damage of the skin*. Additionally, some students did not understand the demand of the question such that, instead of addressing the importance of care and support for PLWHA, they explained the effects of HIV/AIDS such as *lowers body immunity, people die of the disease, reduced labour, put burden to relatives and high costs for buying drugs* instead of justifying the importance of care and support of PLWHA. Some of these either provided a wrong conclusion or could not include it at all, indicating they lacked appropriate essay writing skills. Extract 9.1(a) is a sample of students' incorrect responses.

10. Caring and supporting people living with HIV/AIDS is essential for them to live a healthy lives. In six points, justify this statement.

HIV/AIDS is the transmitted diseases that cause low immunity of body. This diseases is dangerous it cause body immunity be low and power and energy poor.

The following are cause of HIV/AIDS in our daily life in our body. Share sharp tools such as scissors etc. This it can cause HIV/AIDS. Because this blood damage it transmitted with HIV/AIDS and you cause have HIV/AIDS.

Sexual intercourse. This way it cause HIV/AIDS diseases. Without prevention take in this situation you cause HIV/AIDS in your body.

The following are prevention of HIV/AIDS in our daily life and body:

Stop share sharp tools such as scissors etc. This is dangerous when stop to share with your friends, you can not cause HIV/AIDS.

Stop touch blood without gloves in hands. This is preventing of HIV/AIDS when touch blood of HIV/AIDS and you get HIV/AIDS.

Measuring blood transfusion share blood transfusion it cause HIV/AIDS because this person you have shared is HIV/AIDS and you get diseases.

The following are symptoms of HIV/AIDS:

Dizziness, headache, vomiting, pain of joints. This is symptoms of HIV/AIDS you feel tired. Dizziness, headache, vomiting pain joint. When you feel this symptoms go at hospital.

The following is effecting of HIV/AIDS in our body.

The affect immunity of body. HIV it effecting immunity of the body and feel body do not have power and energy.

Generally, HIV/AIDS is the dangerous diseases which affect the immunity of body and loss of power and energy of a body. This are causes, effect, symptoms preventing when you feel this symptoms go at hospital and check you health.

Extract 9.1(a): Student's incorrect responses to question 10

In Extract 9.1(a), the student wrote incorrect introduction by stating that *HIV is the transmitted disease* instead of giving the long form of HIV and AIDS. In the main body, the student wrote ways of transmission, prevention and symptoms of HIV/AIDS instead of justifying the importance of care and support to people living with HIV/AIDS. The conclusion was incorrect as well because he/she wrote the effects of HIV/AIDS instead of the importance of care.

Further analysis reveals that some of the students had low proficiency in the English Language. Therefore, they used Kiswahili language instead of the language of instruction. This implies that students had poor mastery of the English language. Extract 9.1 (b) is a response from one of the student who had low proficiency in the English language.

10. Caring and supporting people living with HIV/AIDS is essential for them to live a healthy lives
In six points, justify this statement.

HIV/AIDS: Is the process in which to position
from the combustion of from compound the people
of the family in people combustion and to
another Country.

HIV/AIDS: huenezwa kwa njia ya nchi kale
huenezwa kwa sababu mtu anapotumia nchi
kale na iether katumia mtu mwenye ugonjwa
wa ukimwi na tumia kama kubata kucha bahati
mbaya kijiitaka an iowe unakuya kujua kiwenabe
na na kuanza kutumia kusababu kuambukiza ugonjwa
wa ukimwi tunashauriwa kutumia kuwembe
ambacho bado ni kipya kabisa Sindano
mtu mwenye maradhi ya ugonjwa wa ukimwi
anapenda hospitalini anachomua huo Sindano
na anakuya mtu ambaye kama maambukizi
ya ukimwi anachomua Sindano aliyechomua mtu
mwenye maambukizi ya utimbi ni Virabisi sana
kupata ugonjwa wa ukimwi na mtu mwenye ugonjwa
huo anapiga mswaki bahati mbaya akatoa
damu ndomo na anangiza ule mswaki na wewe
unakuya kucha kucha huo mswaki unau
tumia unasababisha ugonjwa wa ukimwi

Kupata kwa urahisi sana:
 Kutumia ngono Biziizo Salama:
 It help to people from people to people and
 human activities 'en the proved to
 communication of human & to another
 culture to supply 'en people on keeping.
 Unatabaa kutumia ngono ilyo salama
 na kuyitunga na magongwa kabirini kama
 ukemwa na mengine of the HIV to position of
 kuyamiana na mtu mwenye HIV/AIDS
 Unapojamua ara mtu mwenye maambuzizi ya ukimwi
 Unaweza kupat ugonjwa kw kwa urahisi sana na
 kusababisha usumbufu zidi katika jama' pom
 people 'en the proved 'en human and human
 kwenye tendo la ndoa for family to
 another point.
 Mtu mwenye ugonjwa wa HIV/AIDS
 Unajulikana kama kotohoa sana muuli:
 Kuchot kuzoofeka kwa muuli huyo anawe
 kujulikana kwagwa kama hizi ne moja wapa
 ya nje mtu mwenye HIV/AIDS.

Extract 9.1 (b): Student's incorrect responses to question 10

Extract 9.1(b), is a response of the student who used Kiswahili language. However, he/she explained ways of transmission of HIV/AIDS and some symptoms instead of justifying the importance of caring and supporting people living with HIV/AIDS.

The students who scored high marks (9 - 15) demonstrated understanding of care and support for people living with HIV and AIDS (PLWHA). They gave a correct introduction, most or all importance of care and support to people living with HIV/AIDS (PLWHA) and a relevant conclusion. They explained the correct importance of care and support for PLWHA such as giving them hope, reduction of fear of death, making them feel happier, secured, less isolated, live longer, reducing the risk of infection with other

diseases and positive attitude to work. Extract 9.2 is a sample of students' correct responses.

Caring and supporting people living with HIV/AIDS is essential for them to live a healthy lives. In six points, justify this statement.

HIV/AIDS is a dangerous disease to people. HIV stands for human immunodeficiency virus while AIDS stands for acquired immunodeficiency syndrome. PLWHA means that people living with HIV/AIDS. They must be cared and supported because of the following reasons:-

Reduces fear of death; when a person gets HIV/AIDS, he/she feels that is the end of life.

But when society support and care for them and giving them hope they will feel that they are also human being and that depression/fear of death will be reduced and make them live long.

Reduces the risk of infection with other diseases; when a society cares and supports people living with HIV/AIDS, it reduces the spread of other diseases. Also when the society provides them with balanced diet and regard them as others, it will make them to restore their health.

It makes them feel comfortable people with HIV/AIDS must be clean, their clothes and beddings must be clean so if the society cares and supports them, their health will be restored and they will be comfortable all the time.

It gives them hope; people who have HIV/AIDS can feel themselves as guilty persons. Also these people can hate themselves so, if the society love and care them, they can give them hope and can realize that they are human beings as others in the society and make them to live long.

It gives them strength to work; caring for people living with HIV/AIDS gives them strength to work and earn money which will help them to buy food and medicine.

It makes them to be happy; giving them love and care, helps them to forget about their condition and their status and feel as other people. They will develop sense of happiness and live a healthy and happy life.

Generally, caring and supporting the people living with HIV/AIDS (PLWHA) makes them to be happy and to feel like other people. So societies should not segregate people living with HIV/AIDS.

Extract 9.2: Student's correct responses to question 10

In Extract 9.2, the student correctly explained the importance for caring and support to PLWHA. Also, he/she wrote a well organised essay with good introduction, main body and a relevant conclusion. Additionally, the student demonstrated good command of the English language.

3.0 ANALYSIS OF THE STUDENTS' PERFORMANCE PER TOPIC

A total of nine (9) topics were assessed in Biology FTNA 2023. The analysis of the students' performance shows that students had good performance (86.05%) in the topics of *Introduction to Biology, Health and Immunity, Cell Structure and Organisation, Nutrition, Balance of Nature, Transport of Materials and Gaseous Exchange and Respiration*. These topics were assessed in question 1 which was a multiple choice question.

The topics with average performance were *Safety in Our Environment* (62.15%), *Cell Structure and Organisation* (45.73%), *Introduction to Biology* (45.08%) and *Classification of Living Things* (41.47%). These topics were assessed in questions 7, 5, 4 and 8 of which were short answer type.

The topics with weak performance were *Transport of materials in Living Things* (25.51%), *Healthy and Immunity* (25.23%) and *Nutrition* (14.21%) which were assessed in questions 9, 3, 10 and 6 respectively. Questions 9, 3 and 6 were short answer type, while question 10 was an essay. A summary of the students' performance in FTNA 2023 in terms of topics and questions is presented in the appendix.

4.0 CONCLUSION

The performance in Biology in the FTNA 2023 was average because 55.74 per cent of the students scored from 30 marks or above. The analysis of the students' responses revealed that the students had good performance on question 1 (86.05%). The questions which had average performance were 7 (62.15%), 5 (45.73%), 4 (45.08%), 8 (41.47%) and 2 (34.64%). However, questions 10, 9 and 6 had weak performance of 15.82, 15.70 and 14.21 per cent, respectively.

The good performance in some topics was attributed to the students' sufficient knowledge about the assessed concepts, students' ability to understand the demands of the questions and good drawing skills. However, weak performance was contributed by insufficient knowledge of the tested concepts, failure to understand the demands of the questions, poor proficiency in the English language and insufficient drawing skills.

5.0 RECOMMENDATIONS

Based on the Students' Item Response Analysis (SIRA) provided in this report, it is recommended that teachers should:

- (a) use models/charts/specimen of the mammalian heart to guide students through questions and answers to list the external and internal parts of the mammalian heart and discuss on their functions in teaching and learning of *Transport of materials in Living Things*. Also, should use charts/pictures/ photographs showing the process of blood transfusion to guide students in groups to discuss the

precautions to be taken during blood transfusion and the advantages of blood transfusion.

- (b) organise a study visit to a local health facility to investigate the causes, symptoms, mode of transmission and effects of common infections and diseases in teaching and learning of *Health and Immunity*. Also, should use pictures showing how to take care for PLWHA and guide students through questions and answers to explain the importance of providing care and support to PLWHA in the family, community and school.
- (c) organise a study visit to processed, preserved and stored food and guide students in groups to discuss and make presentations on various methods of food processing, preservation and storage.

Students' Performance Topic - wise in Biology FTNA 2023

S/N	Topic	Question Number	FTNA 2023		
			Percentage of Students who Scored from 30% or Above	Average Performance Per Topic (%)	Remarks
1.	Introduction to Biology, Transport of Materials in Living Things, Health and Immunity, Gaseous Exchange and Respiration, Nutrition, Classification of Living Things and Balance of Nature.	1	86.05	86.05	Good
2.	Safety in Our Environment	7	62.15	62.15	Average
3.	Cell Structure and Organisation	5	45.73	45.73	Average
4.	Introduction to Biology	4	45.08	45.08	Average
5.	Classification of Living Things	8	41.47	41.47	Average
6.	Transport of Materials in Living Things	2	35.31	25.51	Weak
		9	15.70		
7.	Health and Immunity	3	34.64	25.23	Weak
		10	15.82		
8.	Nutrition	6	14.21	14.21	Weak

