THE NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

STUDENTS' ITEMS RESPONSE ANALYSIS REPORT FOR THE FORM TWO NATIONAL ASSESSMENT (FTNA) 2018

033 BIOLOGY

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FOREWORD

The National Examinations Council of Tanzania is delighted to issue the report on Students' Item Response Analysis (SIRA) in Biology for the Form Two National Assessment (FTNA) 2018. The FTNA assesses the competence gained by students after two years of study.

This report provides feedback to students, teachers, parents, policy makers and the public in general on the performance of the students. The report highlights factors which contributed to good or poor performance of the students. The analysis shows that students had good performance in question 1, 2 and 5. The questions with average performance were 3, 6, 8 and 10. The questions with weak performance were 4, 7, 9 and 11. The good performance was due to adequate knowledge of the topics tested, ability to understand the demand of the question, correct spellings of the scientific terms and good English language proficiency. The weak performance was due to inadequate knowledge of the topic tested, failure to understand the demand of the questions, misspellings of the scientific terms and low proficiency in the English language.

It is expected that, the feedback will enable teachers and other stakeholders to take appropriate measures in order to improve the teaching and learning of Biology. In addition, the Council hopes that the appropriate measures that will be taken by teachers and students will improve performance not only in FTNA but also in NECTA examinations at higher levels.

Finally, the National Examinations Council of Tanzania will highly appreciate comments and suggestions from teachers, students and members of the public in general that can be used for improving future reports. The Council is grateful to all stakeholders who provided valuable assistance in the preparation of this report in various capacities.

Dr. Charles E. Msonde
EXECUTIVE SECRETARY

1.0 INTRODUCTION

This report is an analysis of responses by the students who sat for the Biology FTNA in November 2018. There was a total of 545,042 registered students of whom 503,881 sat for the assessment and only 346,866 (68.84%) passed. This performance is higher by 15.68 percent when compared to 2017 Biology FTNA where 257,652 (53.16%) passed.

The FTNA Biology paper was set in accordance with the NECTA format issued in 2017. The questions were composed to assess the biological competences anticipated after completion of Form One and Two Biology syllabus of 2010.

This paper consisted of eleven (11) questions in sections A, B and C. Section A comprised four (4) questions; Multiple choice questions, True and False, Matching and Completion of the statement items. In section A question number one (1) and two (2) carried ten marks each while question three (3) and four (4) each one carried five (5) marks. Section B had five (5) short answer questions which carried ten (10) marks each. Section C had two essay questions each carrying 20 marks. Students were required to answer all questions in sections A and B and opt for only one (1) question in section C.

The report begins by explaining what the questions required from the students and proceeds to analyse the students' performance. 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 percent or above of the marks allocated to the question fell within the range of 65 to 100 (green), 30 to 64 (yellow) and 0 to 29 (red) respectively. It proceeds with highlighting the challenges that the students faced in responding to the questions and suggests the plausible reasons as to why they occurred. Extracts of responses from the students' scripts have been presented to show how they responded to questions in view of the demand of each item. Additionally, some charts and graphs are used to illustrate the students' performance in each question. Finally, the report ends by giving a conclusion and some recommendations. In due regard, it is expected that teachers, students and educational stakeholders, will take advantage of the report findings to identify areas in which students had weakness and in so doing use the information to improve the teaching and students learning in Biology subject.

2.0 ANALYSIS OF THE STUDENT'S PERFORMANCE PER QUESTION

2.1 Section A: Objective Questions

This section comprised four (4) questions; Multiple Choices, True and False, Matching Items and Completion of the Statements items. All questions in this section were compulsory.

2.1.1 Question 1: Multiple Choice Items

This question comprised ten (10) multiple choice items carrying a total of ten (10) marks. For each of the items (i) to (x), the students were required to choose the correct answer from four (4) alternatives and write the letter of the correct response in the spaces provided. Question items were extracted from nine topics, namely: Nutrition, Balance of Nature, Transport of Materials in Living Things, Introduction to Biology, Safety in Our Environment, Gaseous Exchange and Respiration, Cell Structure and Organization, Health and Immunity and Classification of Living Things.

The analysis of students performance in this question shows that 69.2 percent of the students scored from 3 to 6 marks out of the ten marks allocated to this question. Students who scored from 7 to 10 marks were 15.8 percent and those who scored from 0 to 2.5 marks were 15 percent. Figure 1 summarizes the students' performance in this question.

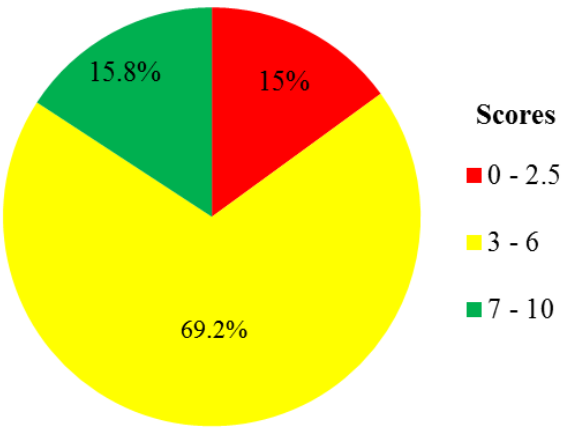


Figure 1: *The summary of the students performance in question 1.*

Figure 1 shows that students' performance in this question was good (85%). This indicates that the students had adequate knowledge of the topics tested. The outstanding performance in this question was observed in items (iii), (v), (vi) and (viii). Despite the good performance, the analysis shows that there were students who did not score full marks. Most of these students faced difficulty in attempting items (i), (ii), (iv), (vii), (ix) and (x). The analysis of the items of which students faced difficulty are presented hereunder.

Item (i) Which of the following mineral salts is required by plants in large quantity?

A	Calcium	B	Zinc
C	Copper	D	Iron.

The correct answer for this item was alternative *A, Calcium.* The students who chose *A* were familiar with mineral requirement in plants and animals. Those who chose incorrect responses *B, Zinc* and *C, Copper* did not understand that these minerals are needed in small amount (micro elements) in both plants and animals. On the other hand, those who chose *D, Iron* failed to understand that iron is a macro element in animals but not in plants.

Item (ii) Which of the following foods should be added to the diet of a person suffering from scurvy?

A	Groundnuts	B	Orange
C	Cassava	D	Fish.

The correct answer for this item was response *B, Orange.* The students who chose *B* knew that scurvy is a vitamin C deficiency disease characterised by bleeding gums which can be corrected by feeding on citrus fruits such as oranges and lemons. Moreover, some of the students selected alternative *A, Groundnuts* while others *D, Fish.* These students failed to recognise that groundnuts and fish are sources of protein which build and repair the body. Those who chose *C, Cassava* failed to realise cassava is a source of carbohydrate which energize the body.

Item (iv) The movement of bulk fluid materials along a vessel or tube is termed as:

A	Transport	B	Osmosis
C	Mass flow	D	Diffusion.

The correct answer for this item was alternative *C, Mass flow*. The students who chose the correct answer were aware that mass flow allows the passage of large quantity of material along the vessels or tubes. Those who selected response *B, Osmosis* and *D, Diffusion* failed to realise that osmosis is the movement of water molecules from a weak solution to a strong solution through a semi permeable membrane while diffusion is the movement of particles from high concentrated region to the low concentrated region and both are used to transport materials in small quantities. Those who selected response *A, Transport* failed to realise that transport is the process by which materials are carried either from the environment into the organism or from one part of the organism to another.

Item (vii) A respiratory surface of fish is called

A	Gills	B	Spiracle
C	Fins	D	Operculum.

The correct answer for this item was *A, Gills*. The students who chose the correct response had adequate knowledge of respiratory surfaces of various organisms. Those who chose alternative *B, Spiracles* failed to understand that spiracles are openings through which air enter tubes called trachea in grasshoppers. Those who selected *C, fins* failed to understand that fins are structures fish use for movement. On the other hand, those who chose *D, operculum* failed to understand that operculum is a gill cover.

Item (ix) A communicable disease which affects a large number of people in a short period of time at a given locality is referred as

A	pandemic	B	endemic
C	sporadic	D	epidemic.

The correct response for this item was alternative *D, epidemic*. Students who chose the correct response had adequate knowledge of infections and diseases which is taught under the topic of Health and Immunity. Those who chose alternative *A, pandemic* failed to realise that the term refers to

communicable disease which spread in a large geographical area such as a continent or the whole world. On the other hand, those who chose alternative *B, endemic* failed to understand that the term refers to the disease which occurs regularly in an area. Those who chose *C, sporadic* failed to realise that the term refers to the disease which occurs occasionaly at random intervals in a given area.

Item (x) Why bats and birds are not placed in the same species while they are closely related organisms?

A They cannot interbreed to produce a fertile offspring
B They can interbreed to produce a fertile offspring
C One lay egg and another can give birth
D One possesses feathers and another short beak.

The correct answer for this item was alternative *A, They cannot interbreed to produce a fertile offspring.* Students who chose *A* had clear understanding of the taxonomic ranks taught under the topic of Classification of Living Things. Students who chose *B, They can interbreed to produce a fertile offspring, C, One lay egg and another can give birth* and *D, One possesses feathers and another short beak* failed to understand that organisms must have many features in common in order to belong to the same species. Some of the common features include the ability to interbreed freely or naturally to produce viable offsprings. Therefore, bats and birds do not belong to the same species since they lack the ability to interbreed freely to give viable offsprings.

2.1.2 Question 2: True and False Items

This question consisted of ten statements related to nine (9) topics namely: Health and Immunity, Introduction to Biology, Classification of Living Things, Balance of Nature, Gaseous Exchange and Respiration, Transport of Materials in Living Things, Nutrition, Cell Structure and Organization and Safety in Our Environment. Students were required to write True for a correct statement and False for an incorrect statement.

The analysis of the students' performance shows that 52.5 percent of the students scored from 3 to 6 marks, 44.8 percent of the students scored from 7 to 10 marks and 2.7 percent of the students scored from 0 to 2 marks. Figure 2 summarizes the performance of the students in this question.

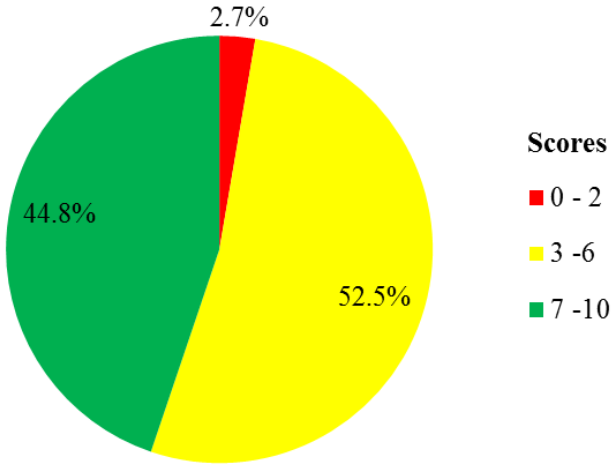


Figure 2*: The summary of the students' performance in question 2.*

Figure 2 reveals that students' performance in this question was good since 97.3 percent of the students scored 30 percent or more of the total marks allocated to this question. The students who performed well in this question had sufficient knowledge of most biological concepts asked. They were able to identify the correct and incorrect statements accordingly. Extract 2.1 illustrates a response from a student who scored full marks.

Extract 2.1

2. For each of the items (i) – (x), write **True** if a statement is correct or **False** if a statement is not correct in a space provided.

(i) People living with HIV/AIDS should be isolated from the community..False.....

(ii) A microscope is an instrument that is used to magnify large objects.....False.....

(iii) Kingdom is the highest rank of classification.....True.....

(iv) In ecosystem herbivores feeds on carnivores.....False.....

(v) Inhaled air contains more oxygen than exhaled air..True.....

(vi) Liverwort is a representative member of Kingdom Fungi.....False.....

(vii) Ventricles have thicker walls than the auricles.....True.....

(viii) Colon is a special site for absorption of digested food materials.....False.....

(ix) Unicellular organisms are made up of one cell only.....True.....

(x) Poor waste disposal may cause accidents at home and school....True.....

Extract 2.1 shows a sample of response from a student who had correct responses in all items.

Despite this good performance, most of the lower achievers faced difficulty in answering items (i) and (v). Item (i) stated that *People living with HIV/AIDS should be isolated from the community*. In this item, students failed to recognize that living with people with HIV/AIDS does not cause one to be infected because HIV can be transmitted through contact with fluid from the infected person. Thus isolating people living with HIV/AIDS amounts to unnecessary discrimination. Isolating them will make them feel unhappy, suicidal and the disease will have a greater effect on them.

Item (v) stated that *Inhaled air contains more oxygen than exhaled air*. In this item students failed to understand that exhaled air is the one which is taken out of the body while inhaled air is the one which is taken into the body. The incorrect responses in this item show that the students had insufficient knowledge of the concepts: exhaled and inhaled air. Extract 2.2 is a sample of students' poor response.

Extract 2.2

2. For each of the items (i) – (x), write **True** if a statement is correct or **False** if a statement is not correct in a space provided.

(i) People living with HIV/AIDS should be isolated from the community.....True.....

(ii) A microscope is an instrument that is used to magnify large objects.....True.....

(iii) Kingdom is the highest rank of classification.....false.....

(iv) In ecosystem herbivores feeds on carnivores.....True.....

(v) Inhaled air contains more oxygen than exhaled air.....false.....

(vi) Liverwort is a representative member of Kingdom Fungi.....True.....

(vii) Ventricles have thicker walls than the auricles.....false.....

(viii) Colon is a special site for absorption of digested food materials.....True.....

(ix) Unicellular organisms are made up of one cell only.....false.....

(x) Poor waste disposal may cause accidents at home and school.....false.....

The extract 2.2 shows sample of response from a student who failed to correctly respond to all items. This implies the student lacked content knowledge about the concepts tested.

2.1.3 Question 3: Transport of Materials in Living Things

The question consisted of five (5) matching items derived from a topic of Transport of Materials in Living Things. In this question, students were required to match phrases provided in List A with responses in List B by writing the letter of the correct responses in List B against the item number in List A. The question asked: Match the phrase in **List A** with responses in **List B** by writing the letter of the correct response in **List B** below the corresponding phrase number of **List** A in the table provided.

List A		List B	
(i)	The process by which solvent molecules move from a region of high solvent concentration to a region of low solvent concentration through a selectively permeable membrane.	A	Diffusion
		B	Root hair
		C	Plasmolysis
		D	Xylem
(ii)	The process by which particles move from a region of high concentration to a region of low concentration.	E	Phloem
		F	Haemolysis
		G	Capillarity
(iii)	An extended epidermal cell in plants which absorbs water and mineral salts from the soil.	H	Osmosis
(iv)	The tissue which transport manufactured food from the leaves to the other plant parts.		
(v)	A process by which red blood cell burst due to water gain by osmosis when placed in hypotonic solution.		

The analysis shows that 41 percent of the students scored from 2 to 3 out of 5 marks allotted to this question, 23.5 percent scored from 4 to 5 marks and 35.5 percent scored from 0 to 1 mark out of which 0.8 percent scored 0 mark. Figure 3 summarizes the students' performance in this question.

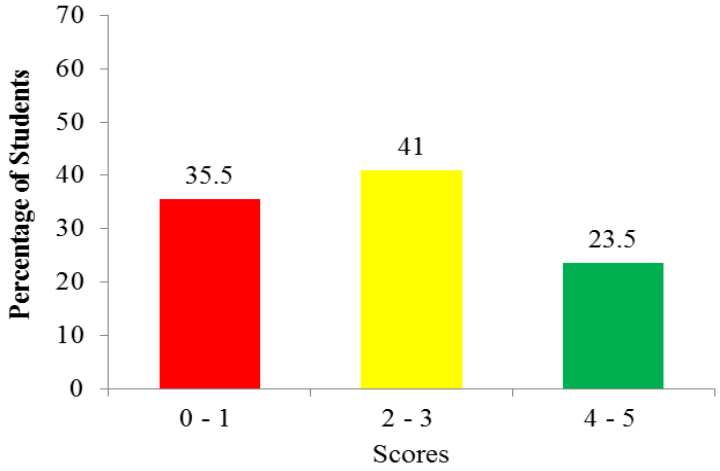


Figure 3: *The summary of the students' performance in question 3.*

Figure 3 shows that students' performance in question 3 was average as more than half (64.5%) scored 30 percent or above. The students who scored full marks (5) in this question had sufficient knowledge of the topic of Transport of Materials in Living Things. Extract 3.1 illustrates a response from a student who matched the phrases correctly and scored full marks.

Extract 3.1

Answer

List A	(i)	(ii)	(iii)	(iv)	(v)
List B	H	A	B	E	F

Extract 3.1 is a sample of a response from a student who matched the phrases correctly and scored full marks.

The analysis of students' responses also indicates that some students faced difficulty in matching phrases in (iii) and (v). In item (iii), the students were required to select a response which correctly matches with a description of an extended epidermal cell in plants which absorbs water and mineral salts from the soil. Most of the students wrote alternative *D, Xylem* instead of *B, Root hair* which is the correct answer. These students failed to understand that root hair is an epidermal cell found in plant roots for absorption of water and mineral salts while xylem is a tissue used for transportation.

In item (v) students were required to select a phrase which correctly matches with a description of a process by which red blood cell bursts due to water gain by osmosis when placed in hypotonic solution. The correct alternative was *F, haemolysis* but most students wrote *C, plasmolysis*. Students failed to understand that haemolysis is a process which takes place in animal cell when placed in a solution with higher amount of water than solutes (hypotonic) while plasmolysis takes place in plant cell when placed in a hypertonic solution. Incorrect matching shows that the students could not distinguish between the effects of osmosis in animal and plant cells. Extract 3.2 is a sample of response from students who failed to match all the items correctly.

Extract 3.2

Answer

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

Extract 3.2 is a sample of response from the student who failed to match all the items of the question correctly. These responses signify that the student had insufficient knowledge of the topic tested.

2.1.4 Question 4: Safety in Our Environment

This question required the students to complete the statements by writing the correct answer in the spaces provided in each item. The question comprised five items from the topic of Safety in Our Environment and had a total of five (5) marks.

Data indicate that 71.8 percent of the students scored from 0 to 1 mark, 22.7 percent of the students scored from 2 to 3 marks whereas 5.5 percent scored from 4 to 5 marks. Figure 4 summarizes the students' performance in this question.

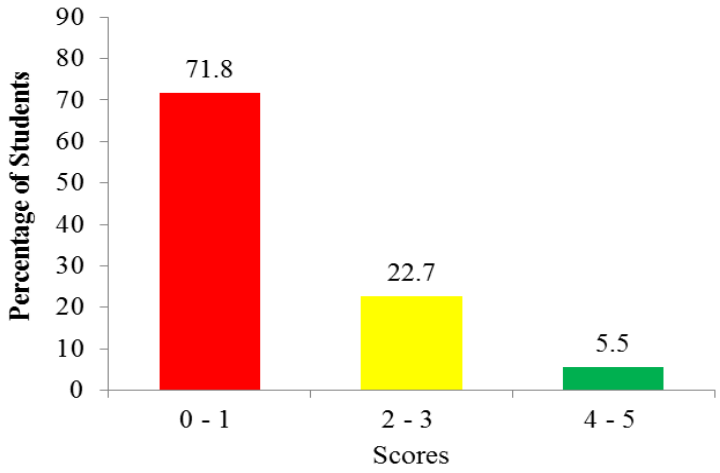


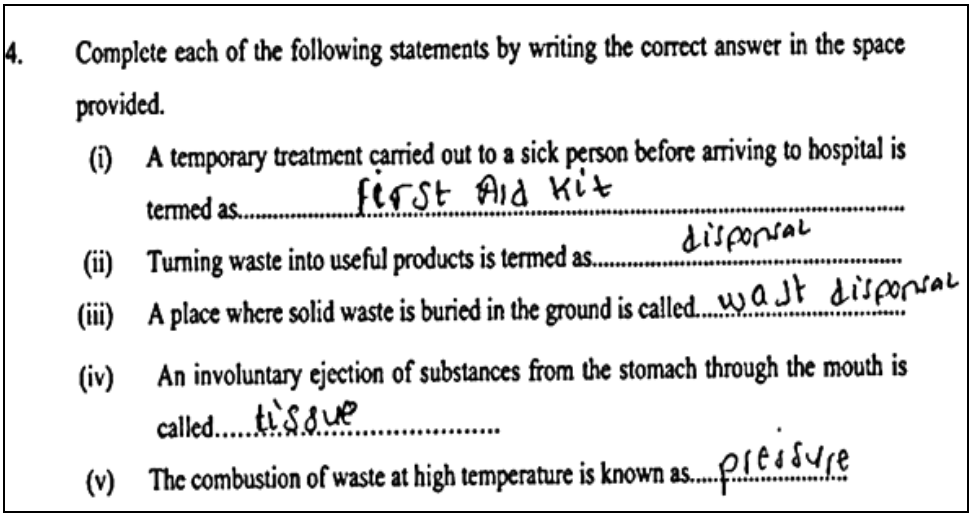
Figure 4: *The summary of the students' performance in question 4.*

Figure 4 shows that the students' performance in this question was weak since 71.8 percent scored low (0 - 1) mark. It was observed that most of the students who scored low marks had inadequate knowledge about Safety in Our Environment. For example, in response to item (i) which required the students to complete the statement *A temporary treatment carried to a sick person before arriving to hospital is termed as* _____ the students wrote *First Aid Kit, hospital* and *disease.* Other students wrongly wrote the importance of First Aid as, *saves life, gives hope and encouragement.* The responses show that the students did not understand that First Aid is a temporary treatment carried out to a sick/injured person before arriving to hospital while First Aid Kit is a small box which is used to store instruments for emergency treatment.

Item (iv) which required the students to complete the statement *An involuntary ejection of substances from the stomach through the mouth is called* _____ some students wrote incorrect responses such as, *swallowing, digestion, oesophagus, chocking* and *alimentary canal* instead of *Vomiting.* Other students wrote *chewing cuds* which is the process where food is being brought back to the mouth periodically for further chewing in ruminants.

In item (v), which required the students to complete the statement *The combustion of waste at high temperature is known as*_____ some students wrote incorrect responses such as *gaseous waste*, *waste disposal*, *burning* and *thermometer* instead of *Incineration*. These responses show that students had inadequate knowledge of the proper methods of waste disposal taught under the topic of Safety in Our Environment. Extract 4.1 illustrates a response of a student who had incorrect responses.

Extract 4.1



4. Complete each of the following statements by writing the correct answer in the space provided.

(i) A temporary treatment carried out to a sick person before arriving to hospital is termed as.....first Aid Kit.....

(ii) Turning waste into useful products is termed as.....disporsal.....

(iii) A place where solid waste is buried in the ground is called.....wast disporsal.....

(iv) An involuntary ejection of substances from the stomach through the mouth is called.....tissue.....

(v) The combustion of waste at high temperature is known as.....pressure.....

Extract 4.1 shows a response from a student who missed out all the items.

Despite the weak performance in this question, 5.5 percent of the students had sufficient knowledge of the topic and performed well. Extract 4.2 is a sample of good response of one student.

Extract 4.2

4. Complete each of the following statements by writing the correct answer in the space provided.

(i) A temporary treatment carried out to a sick person before arriving to hospital is termed as.....First Aid.....

(ii) Turning waste into useful products is termed as.....Recycling.....

(iii) A place where solid waste is buried in the ground is called Land fill.....

(iv) An involuntary ejection of substances from the stomach through the mouth is called.....Vomiting.....

(v) The combustion of waste at high temperature is known as Incineration.

Extract 4.2 shows correct responses from a student who had sufficient knowledge of the concepts tested under the topic of Safety in Our Environment.

2.2 Section B: Short Answer Questions

This section comprised five (5) compulsory short answer questions each question carried ten (10) marks.

2.2.1 Question 5: Cell Structure and Organization

The question had two parts (a) and (b). In part (a) students were required to state the meaning of the terms: (i) a cell (ii) system and (iii) organ as used in Biology. In part (b) students were required to draw a diagram of an animal cell and label its two parts.

The analysis indicates that 52.4 percent of the students scored from 3 to 6 marks, 16.5 percent scored from 7 to 10 marks whereas 31.1 percent scored from 0 to 2.5 marks out of the total marks allocated to this question. Figure 5 summarizes the students' performance in this question.

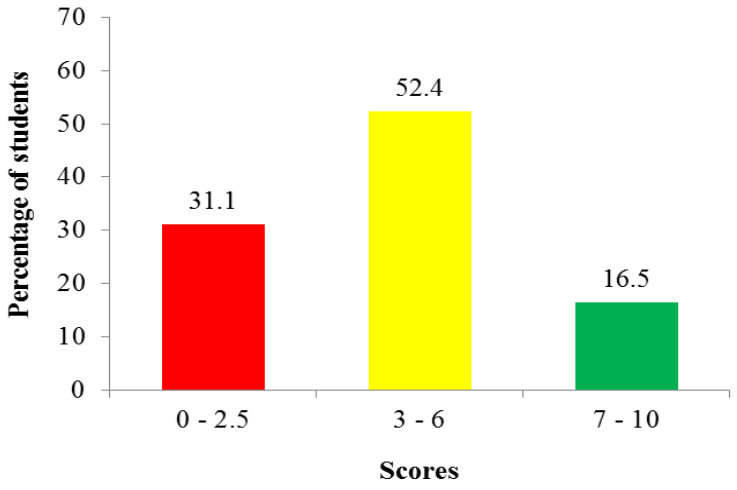


Figure 5: *The summary of the students' performance in question 5.*

The analysis shows that the students' performance in this question was good as the majority (68.9%) scored 30 percent or more of the marks allotted to this question. The students who performed well in part (a) correctly described the terms cell, system and organ. In part (b) the students correctly drew the animal cell and labeled its two parts. Therefore, these responses show that they had adequate knowledge of the concepts asked. Extract 5.1 illustrates a response from a student who answered the question correctly and scored full marks.

Extract 5.1

5. (a) State the meaning of the following terms as used in Biology.

(i) A cell

is a basic unit of life

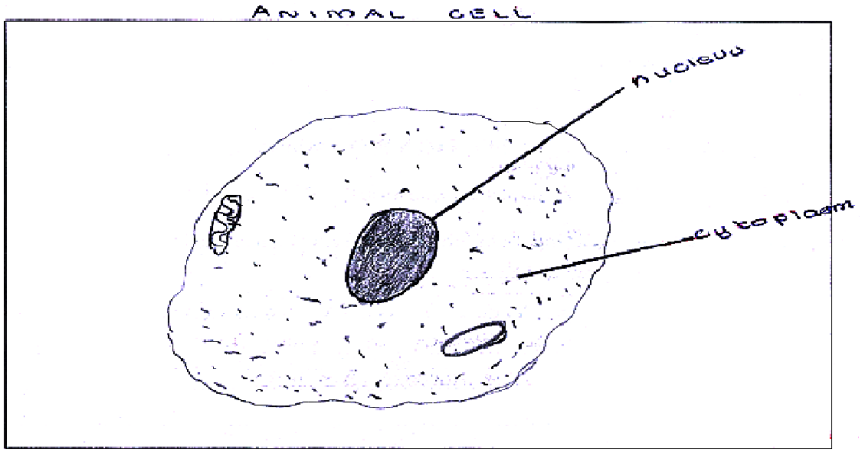
(ii) System

is the group of organs performing the same function

(iii) Organ

is the group of tissues performing the same function

(b) Draw a large diagram of an animal cell and label two parts.



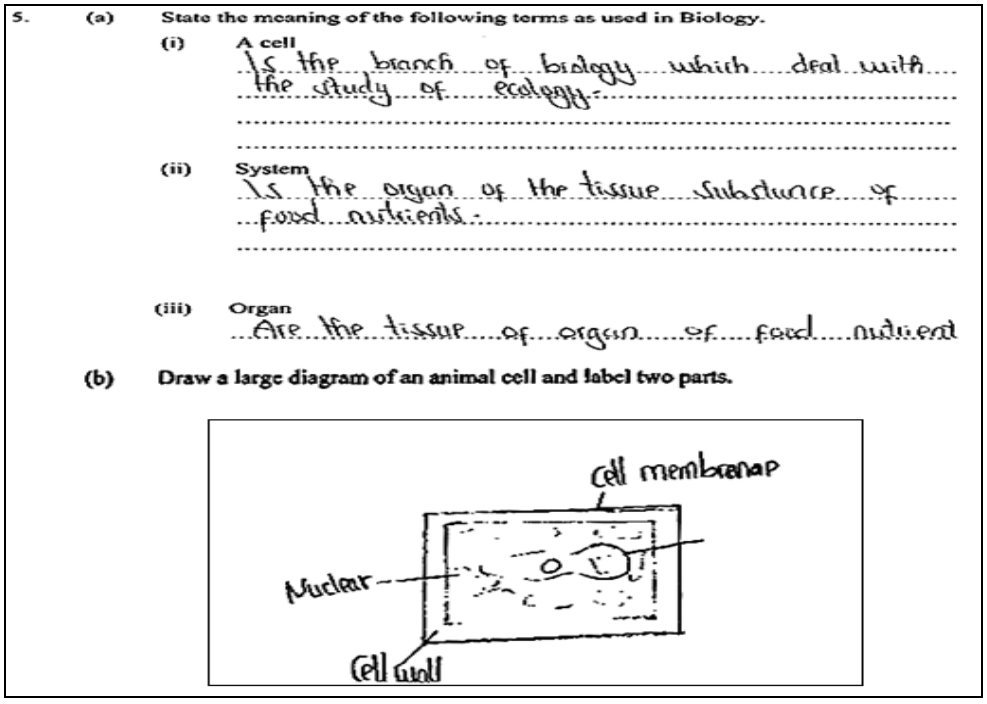
Extract 5.1 is a sample of responses from a student who correctly defined the terms and drew the diagram of an animal cell.

Despite the good performance of some students, other students scored low (0 – 2.5) marks. The students who scored low marks in part (a) failed to state the meaning of terms correctly. Some students wrote irrelevant description of the terms in this question. For example, cell was defined as *the branch of biology which deal with the study of ecology*, *the atom which transport blood to the other parts of the body and the organ in living things.* Other students simply copied the sentences from the question only to fill the gaps.

In part (a) (ii) some students wrote incorrect responses such as *the process which represent tissue, organ, organism, cell and system itself* and *the organ of the tissue substances of food.* Similarly, in part (a) (iii) some of the students wrote incorrect responses such as *a group of systems which perform a certain function, the system of the cell to control cell tissues* and *the system of cell which helps a cell to be stronger.* Other students confused meanings of terms organ and system. This implies that these students lacked clear understanding of the topic of Cell Structure and Organization.

In part (b), some of the students were not able to correctly draw a large diagram of animal cell and label it correctly. Some students drew the plant cell instead of the animal cell. These students failed to recognize that animal cell has neither definite shape nor cell wall. These responses indicate that the students lacked clear understanding of the structures of plant and animal cells. Extract 5.2 shows poor response of one student.

Extract 5.2



Extract 5.2 shows response from a student who failed to state the meaning of terms in part (a). Also in part (b) the student drew plant cell instead of animal cell.

2.2.2 Question 6: Balance of Nature

The question comprised two parts (a) and (b). In part (a) students were required to define the terms biotic and abiotic component. In part (b) students were required to give two examples of organisms in the trophic levels (i) Producers (ii) Primary consumers and (iii) Decomposers.

The analysis indicates that 53.2 percent scored from 0 to 2.5 marks out of ten marks allocated to this question. The students who scored from 3 to 6 marks were 25.5 percent whereas 21.3 percent scored from 6.5 to 10 marks. Figure 6 summarizes the students' performance in this question.

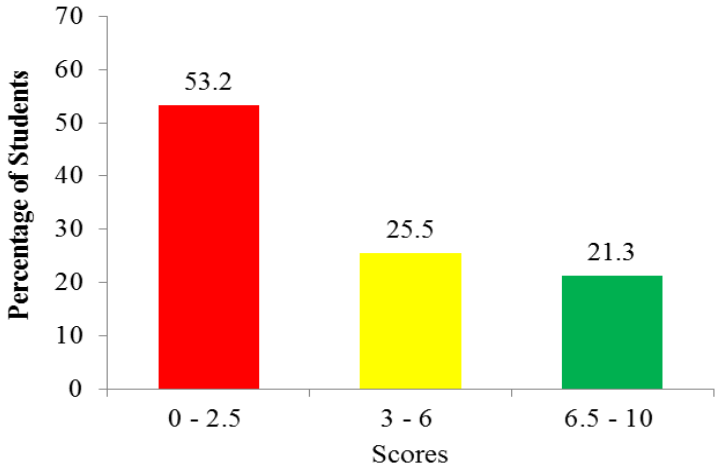
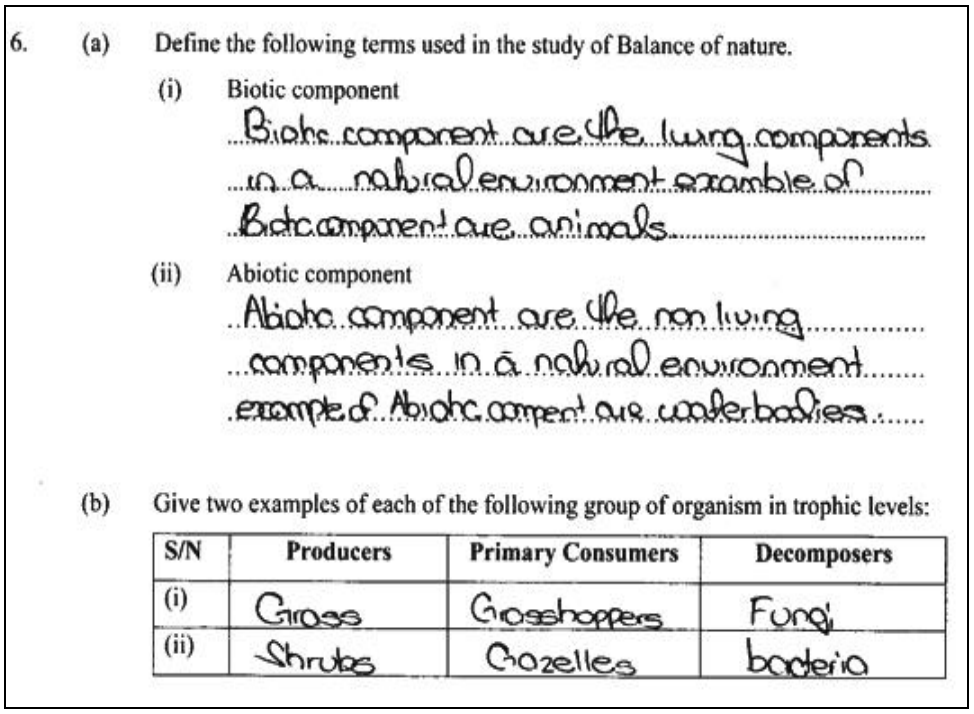


Figure 6*: The summary of the students' performance in question 6.*

Figure 6 shows that the students' performance in this question was average since 46.8 percent of the students scored 30 percent or above of the ten marks allocated to this question. Despite the average performance, 21.3 percent of the students performed well in this question and gave correct responses in almost all parts of the question. They correctly defined the terms biotic and abiotic components. They also correctly wrote examples of organisms in each trophic level. These responses show that they had adequate knowledge about the topic of Balance of Nature. Extract 6.1 illustrates a sample of student's good response.

Extract 6.1



6. (a) Define the following terms used in the study of Balance of nature.

(i) Biotic component

Biotic component are the living components in a natural environment example of Biotic component are animals

(ii) Abiotic component

Abiotic component are the non living components in a natural environment example of Abiotic compent are waterbodies

(b) Give two examples of each of the following group of organism in trophic levels:

S/N	Producers	Primary Consumers	Decomposers
(i)	Grass	Grasshoppers	Fungi
(ii)	Shrubs	Gazelles	bacteria

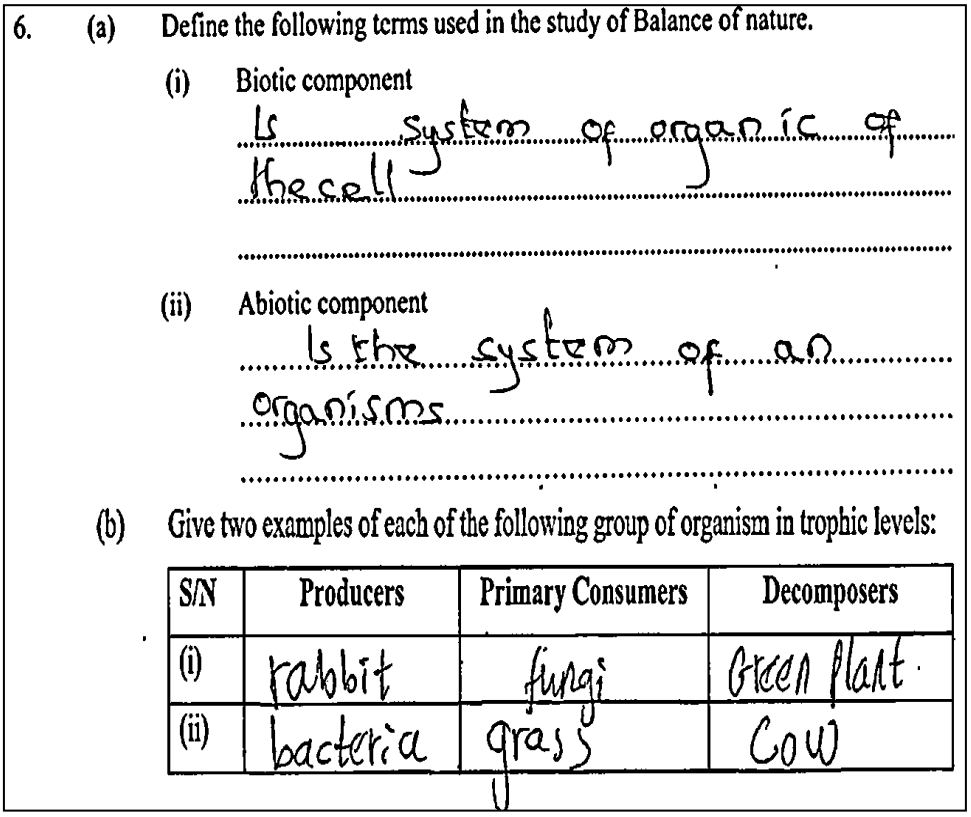
Extract 6.1 shows a response from a student who correctly defined the term biotic and abiotic components and correctly gave examples for producers, primary consumers and decomposers.

However, 53.2 percent of the students scored low (0 – 2.5) marks. It was observed that in part (a) some of the students were not able to correctly define biotic and abiotic components. Some of the incorrect definitions for biotic component were *as a system of organic of the cell, a type of factor which organism feed food from the dead organic matter like hyena,* and *a component that is found in the natural environment.* Others defined biotic component as ecosystem; *natural unit made up of living things and non-living things leads to a self-sustaining system.* Abiotic component was incorrectly defined as *the system of an organisms, the type of ecology which taken by component from the ecology* and *the branch of biology that deals with the relationship of living thing and their natural environment.*

In part (b) some students failed to give two examples of organisms in each trophic level. Some of the incorrect responses were *rabbit, bacteria, man* and *mice*. In addition some of the students knew the correct responses but

misspelt the terms. These students wrote for instance *glasses* instead of *grasses.* For primary consumers some students wrote *fungi, grass, lion, hyena* and *snake.* For decomposers some students wrote *green plants, cow, shrubs, lion, leopard, snakes* and *crocodile.* Others interchanged organisms in their respective trophic levels. These students failed to understand that producers are organisms which can manufacture their own food (green plants). Primary consumers are organisms which feed on green plants. Decomposers (fungi and bacteria) are organisms feed on waste materials and the dead and decaying remains of the plants and animals thereby releasing important minerals in the soil. This is an indicator that students lacked clear understanding about the topic. Extract 6.2 illustrates a sample of student's poor response.

Extract 6.2



6. (a) Define the following terms used in the study of Balance of nature.

(i) Biotic component

Is system of organic of the cell

(ii) Abiotic component

Is the system of an organisms

(b) Give two examples of each of the following group of organism in trophic levels:

S/N	Producers	Primary Consumers	Decomposers
(i)	rabbit	fungi	Green plant
(ii)	bacteria	grass	Cow

Extract 6.2 shows the response ftrom a student who incorrectly defined biotic and abiotic components in part (a). Also in part (b) He/She interchanged the examples of organisms.

2.2.3 Question 7: Nutrition

This question required the students to: (a) identify the part of alimentary canal where villus is found, (b) name the parts labeled with letter A, B and C and (c) state three adaptations of the villus for the absorption of food in the alimentary canal.

Data analysis indicates that 92.9 percent of the students scored from 0 to 2 marks, 5.8 percent scored from 3 to 6 marks whereas 1.3 percent scored from 7 to 10 marks. Figure 7 summarizes students' performance in this question.

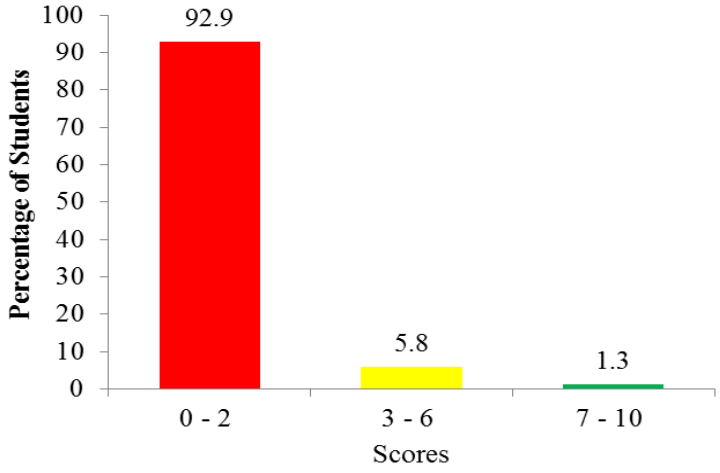


Figure 7*: The summary of the students' performance in question 7.*

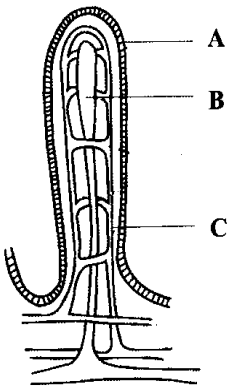
The analysis shows that the performance in this question was weak since 92.9 percent of the students scored from 0 to 2 marks out of 10 marks allocated to this question. These students failed to correctly name the part of the alimentary canal where villus is found. In part (a), for instance, some students wrote incorrect labels such as, *small intestine, internal alimentary canal, colon* and *stomach.* Other students wrote internal parts of the heart as *ventricles* and *auricles* instead of *ileum*. These students failed to understand that small intestine has two parts duodenum and ileum; and that villus is found in the ileum. Furthermore, these students gave labels as in (b) example *A* was labelled *Goblet cell* and *tooth* instead of *epithelium/epithelial/epithelial lining*, *B* as *blood vessel, inner lining, hepatic portal vein, lymphatic vessel* instead of *lacteal* and *C* as *mouth*

cavity, mouth, oesophagus and *small intestine* instead of *blood capillaries* while other students interchanged the labels.

In part (c), some students wrote incorrect adaptations of villus for the absorption of food in the alimentary canal; in this the students wrote, for instance, *to supply protein to all parts of the body*. Some students wrote enzymes as, *peptidase*, *maltase* and *lipase* while other students named various parts of the alimentary canal like *mouth, stomach* and *ileum*. In addition, some of the students wrote the parts of plants; *leaves, stem* and *roots* instead of adaptations of villus for the absorption of food. These students failed to understand the term adaptations means features which enable a structure to carry out its function. These responses show that these students did not understand the demand of the question. Extract 7.1 illustrates a sample of student's poor response.

Extract 7.1

7. Study the structure of a villus shown below and then answer the questions that follow:



(a) In which part of the alimentary canal is villus found? part B

(b) Name the parts labeled with letter **A**, **B** and **C**

A. blood vessels

B. alimentary canal

C. blood diffusion.

(c) State three adaptations of the villus for the absorption of food in the alimentary canal.

(i) Leaves.

(ii) Stems.

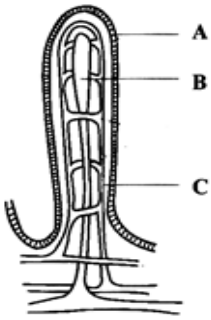
(iii) Roots.

Extract 7.1 is a sample of incorrect response. In part (a) He/She wrote *part B* instead of *ileum*. In part (c) the student wrote parts of the plants instead of the adaptations of villus for the absorption of food in the alimentary canal.

Despite the weak performance in this question, 1.3 of the students performed well. They correctly named the location of villus in the alimentary canal. These students correctly labeled the parts of the villus and correctly stated the adaptation of the villus for the absorption of food in the alimentary canal. Extract 7.2 illustrates a response from the student who correctly answered the question.

Extract 7.2

7. Study the structure of a villus shown below and then answer the questions that follow:



(a) In which part of the alimentary canal is villus found? Ileum

(b) Name the parts labeled with letter **A**, **B** and **C**

A. Thin epithelial membrane

B. Lacteal

C. Blood cappilaries

(c) State three adaptations of the villus for the absorption of food in the alimentary canal.

(i) They are well supplied with a net work of blood cappilaries for transporting absorbed food

(ii) They are many in number to increase surface area for absorption

(iii) They have thin membrane to enable easy diffusion of absorbed food

Extract 7.2 is a sample of response from a student who gave correct responses in all parts of the question.

2.2.4 Question 8: Classification of Living Things

This question required the students to: (a) give the common name of the fungi which grow on bread, (b) outline three phyla of the Kingdom Fungi. and (c) outline five advantages of the Kingdom Fungi.

The analysis indicates that 60.7 percent of the students scored from 0 to 2.5 marks, 25.8 percent scored from 3 to 6 marks whereas 13.5 percent scored from 7 to 10 marks. Figure 8 summarizes students' performance in this question.

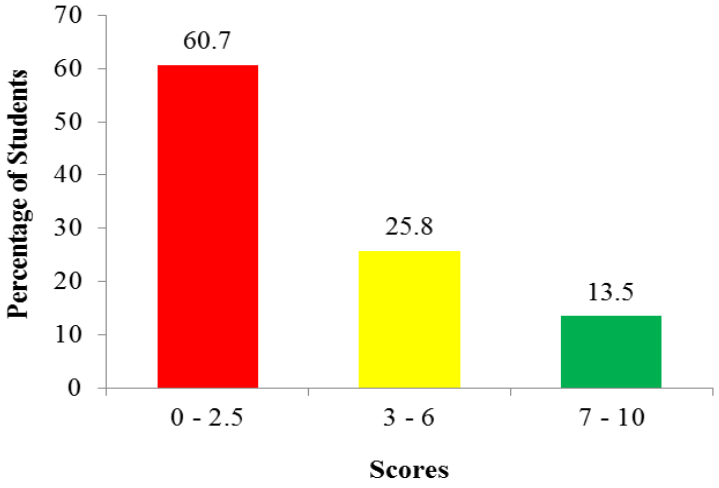


Figure 8: *The summary of the students' performance in question 8.*

Figure 8 shows that the analysis of students performance in this question was average as 39.3 percent of the students scored 30 percent or above of the ten marks allocated to this question. Despite the average performance in this question, 13.5 percent of the students gave correct responses in almost all parts of the question. These students correctly named the common fungi which grow on bread (part a) and correctly outlined the three phyla and the five advantages of the Kingdom Fungi (parts b and c). These responses show that the students had adequate knowledge of the Kingdom Fungi taught in the topic of Classification of Living Things. Extract 8.1 illustrates a sample of a response from the student who correctly answered the question.

Extract 8.1

8. If you put a piece of bread in a wet cupboard after a few days the bread will be covered with organisms called Fungi.

(a) Give the common name of these fungi which grow on bread.

Bread mould

(b) Outline three Phyla of the Kingdom Fungi.

(i) Ascomycota

(ii) Zygomycota

(iii) Basidiomycota.

(c) Outline five advantages of the Kingdom Fungi.

(i) Some organism in kingdom fungs are responsible in fermentation which leads to alcohol formation

(ii) Some organism in kingdom fungi decompose unwanted left overs which increase soil fertility.

(iii) Organisms like yeast are used in bakery proces to make breads.

(iv) Organism like mushrooms act as food nutrients to human beings.

(v) Some organism in kingdom fungi are used to produce medicine

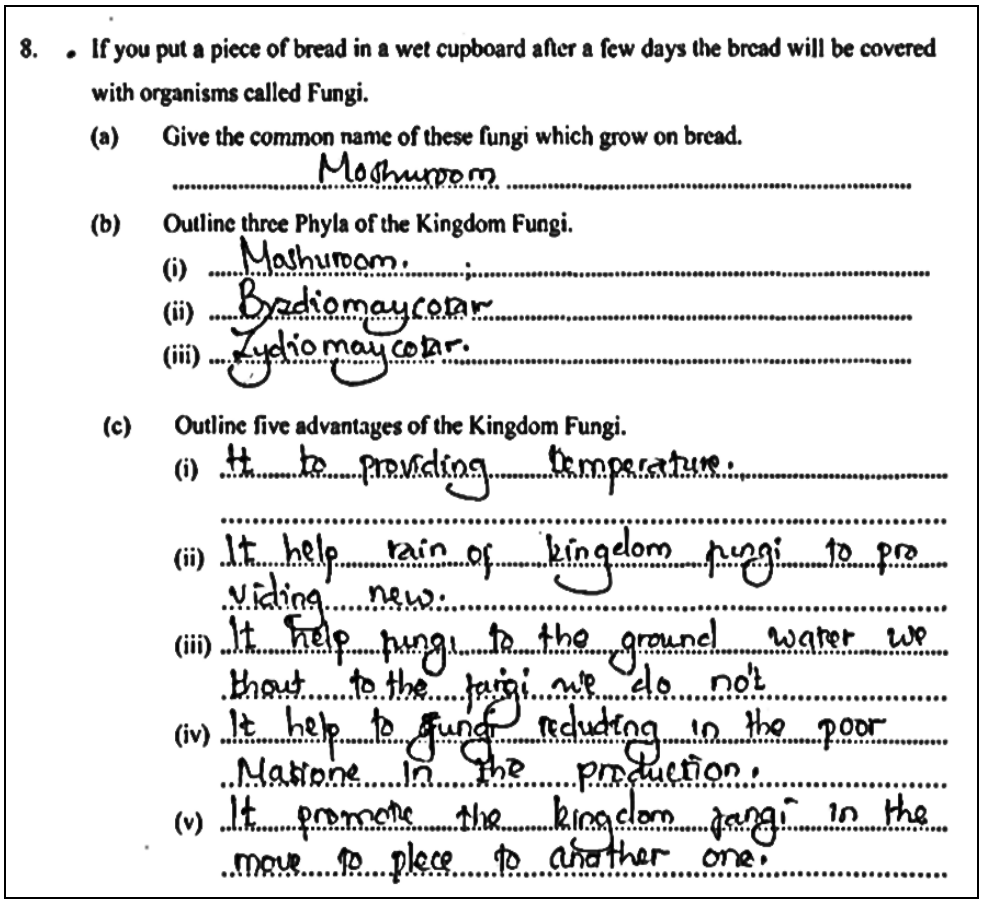
Extract 8.1 is a sample of responses from a student who correctly named the fungi which grow on bread and outlined the three phyla and five advantages of the Kingdom Fungi.

However, more than half (60.7%) of the students scored below 3 marks out of ten marks allocated to this question. Most of students failed to give correct reponses to almost all parts of the question. In part (a) the students gave incorrect names such as *mushroom, maize, bacteria, yeast* and *virus* instead of *bread mould/mucor.* These responses indicate that the students failed to realize that even though mushroom and yeast are fungi, they do not germinate on bread. In part (b), most of the students failed to outline three phyla of the Kingdom Fungi. Some of the students wrote taxonomic units such as *Class, Order* and *Genus* while others wrote the major groups

of living things such as *Kingdom Monera, Kingdom Plantae* and *Kingdom Fungi*. In addition, other students wrote divisions of the Kingdom plantae *Filicinophyta, Coniferophyta* and *Angiospermophyta*. Others knew the correct responses but misspelt the terms; for example they wrote *Byzdiomaycorar* instead of *Basidiomycota, Zydiomaycorar* instead of *Zygomycota* and *Ascomycoter* instead of *Ascomycota*. These words cannot be awarded when they are misspelt.

In part (c), most of the students wrote incorrect responses as *they are used to make vaccines, they are used to study cellular and molecular biology, they prevent soil erosion* and *it help to grow plants such as mushroom.* Other students wrote the following characteristics of the Kingdom Fungi - *they are eukaryotic, they store food in form of glycogen* and *they are made up by hyphae* instead of the advantages of the Kingdom Fungi. These responses indicate that the students had inadequate knowledge about Kingdom Fungi which is taught under the topic of Classification of Living Things. Extract 8.2 is the sample of response from a student who wrote incorrect responses.

Extract 8.2



8. If you put a piece of bread in a wet cupboard after a few days the bread will be covered with organisms called Fungi.

(a) Give the common name of these fungi which grow on bread.

Moshuroom

(b) Outline three Phyla of the Kingdom Fungi.

(i) Moshuroom.

(ii) Byzdiomaycorar

(iii) Zydiomaycorar.

(c) Outline five advantages of the Kingdom Fungi.

(i) It to providing temperature.

(ii) It help rain of kingdom fungi to providing new.

(iii) It help fungi to the ground water we thout to the fungi we do not

(iv) It help to fungi reducing in the poor Matrone in the production.

(v) It promote the kingdom fungi in the move to plece to another one.

Extract 8.2 is a response from a student who wrote *Byzdiomaycorar* instead of *Basidiomycota* and *Zydiomaycorar* instead of *Zygomycota*. Also He/She wrote incorrect advantages of the Kingdom Fungi.

2.2.5 Question 9: Gaseous Exchange and Respiration

The question comprised three parts: (a), (b) and (c). In part (a), students were required to define (i) aerobic and (ii) anaerobic respiration. In part (b), students were required to mention three products of anaerobic respiration in yeast cell. In part (c), students were required to write a balanced equation to summarize the process of aerobic respiration.

The analysis indicates that 76.2 percent of the students scored from 0 to 2.5 marks, 19.4 percent scored from 3 to 6 marks whereas 4.4 percent scored from 6.5 to 10 marks. Figure 9 summarizes the performance of the students in this question.

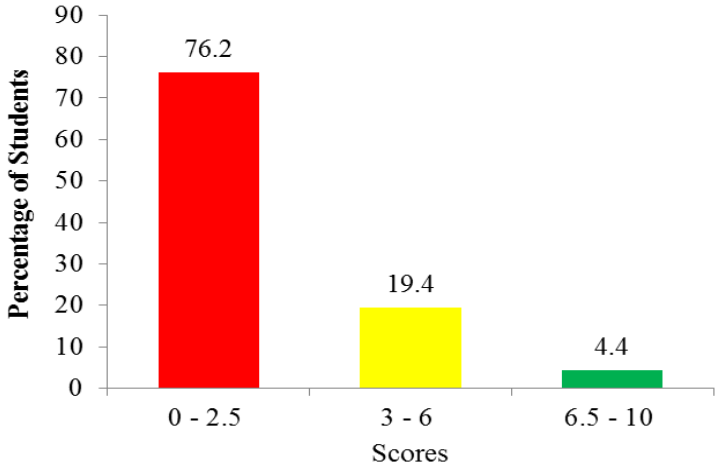


Figure 9: *The summary of the students' performance in question 9.*

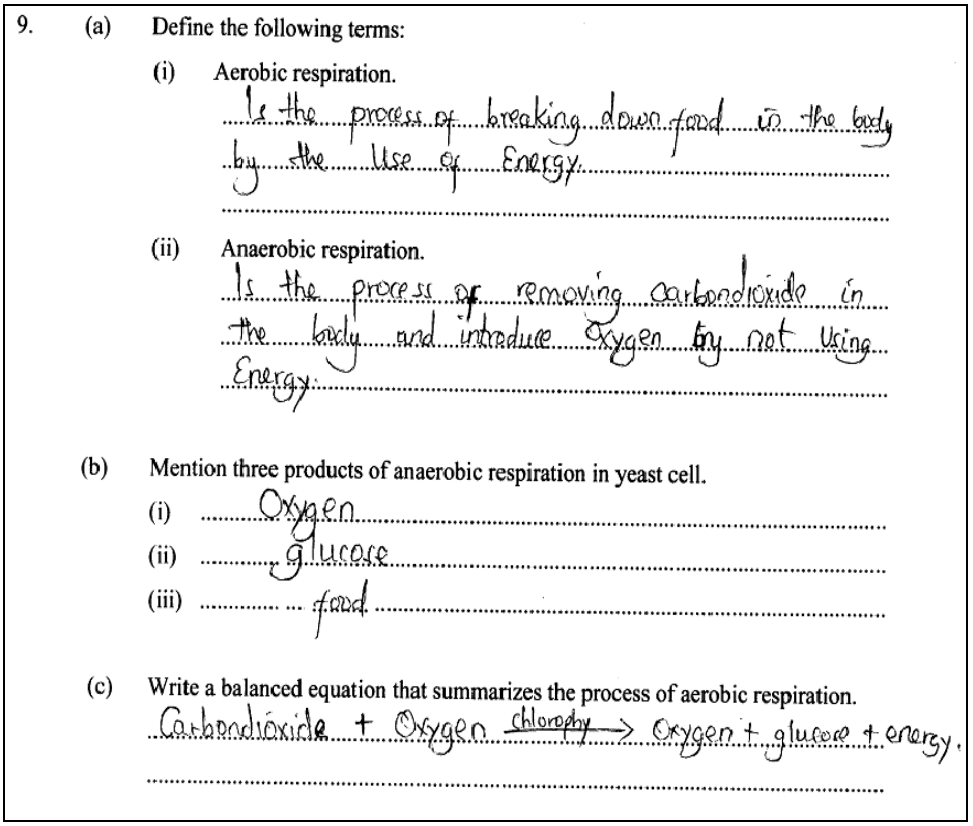
Generally, figure 9 shows that the students' performance in this question was weak since 76.2 percent scored from 0 to 2.5 marks out of ten marks allocated to this question. In part (a), most of the students wrote incorrect definitions of aerobic and anaerobic respiration. Examples of incorrect definitions are; *aerobic respiration is the process of breaking down food in the body by the use of energy, is the type of respiration where there is more oxygen, is the type of respiration which by it is done inside the body of the living thing* and *is the inhaling and exhaling where there is more oxygen and less carbon dioxide.* Likewise, for anaerobic respiration these students wrote *is the type of respiration where by oxygen is not inter in the body* and *the process of removing carbon dioxide in the body and introduce oxygen by not using energy.* These students failed to differentiate aerobic and anaerobic respiration. In part (b) some of the students wrote incorrect responses such as *glucose, oxygen* and *lactic acid*. Incorrect responses were also observed in writing factors which affect the rate of respiration. Students wrote the following: *temperature, age* and *size of the body* instead of *Ethanol/alcohol, Carbon dioxide* and *Energy (ATP).*

In part (c), some students failed to write a balanced equation that summarize the process of aerobic respiration. For example, they wrote,
Oxygen + Energy $\longrightarrow$ *Water + Carbon dioxide,*

$$C_6H_{12}O_6 \xrightarrow[sunlight]{chlorophyl} CH_6O + 2HO$$

Morever, most of the students skipped this question indicating that they had no sufficient knowledge about Gaseous Exchange and Respiration. This indicates that most of the teachers did not cover this topic since it is the last topic in Form Two Syllabus. Extract 9.1 is the sample of response from a student who wrote incorrect responses.

Extract 9.1


9. (a) Define the following terms:

(i) Aerobic respiration.

Is the process of breaking down food in the body by the use of Energy.

(ii) Anaerobic respiration.

Is the process of removing carbondioxide in the body and introduce oxygen by not using Energy.

(b) Mention three products of anaerobic respiration in yeast cell.

(i) Oxygen

(ii) glucose

(iii) food

(c) Write a balanced equation that summarizes the process of aerobic respiration.

Carbondioxide + Oxygen $\xrightarrow{\text{chlorophy}}$ Oxygen + glucose + energy.

Extract 9.1 is a sample from a student who wrote incorrect reponses in all parts of the question. For example He/She wrote *oxygen, glucose* and *food* instead of *ethanol/alcohol, carbondioxide and energy* in part (b).

Despite the weak performance, 4.4 percent of the students performed well. They correctly defined aerobic and anaerobic respiration in part (a). In part (b), the students mentioned three products of anaerobic respiration in yeast cell. In part (c), students wrote a balanced equation that summarizes the process of aerobic respiration. Extract 9.2 shows a sample of student's good response.

Extract 9.2

9. (a) Define the following terms:

(i) Aerobic respiration.

Is the type of respiration where by food substances are brakendown in presence of Oxygen to release energy.

(ii) Anaerobic respiration.

Is the type of respiration where by food substances are broken down in absence of oxygen to release energy.

(b) Mention three products of anaerobic respiration in yeast cell.

(i) Ethanol (Alcohol)

(ii) Carbon dioxide

(iii) Little amount of energy.

(c) Write a balanced equation that summarizes the process of aerobic respiration.

$C_6H_{12}O_6 + 6O_2 \longrightarrow 6H_2O + 6CO_2 + ATP$

(glucose) (oxygen) (water) (carbondioxide) (Energy)

Extract 9.2 is a response from the student who wrote correct answers in all parts and scored full marks.

2.3 Section C: Essay Questions

This section comprised two questions and students were required to attempt only one question.

2.3.1 Question 10: Introduction to Biology

The question required the students to explain the importance of studying Biology.

The analysis indicates that 496,387 (98.1%) students attempted this question whereas 58.2 percent of students scored from 0 to 5.8 marks. The students who scored from 6 to 12.6 marks were 27.4 percent while those who scored 13 to 20 marks were 14.4 percent. Figure 10 summarizes the performance of the students in this question.

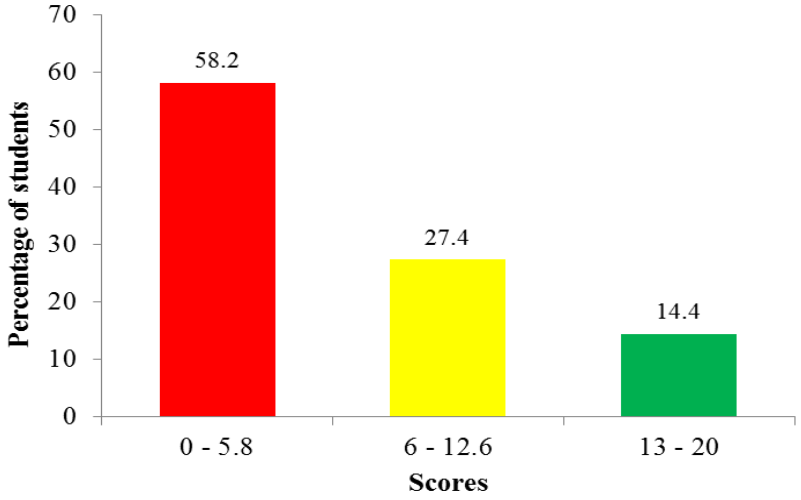


Figure 10: *The summary of the students' performance in question 10.*

Figure 10 shows that the students' performance in this question was average (41.8%). Despite the average performance, 14.4 percent of the students performed well in this question. They correctly explained the importance of studying Biology and organized their essays logically having introduction, main body and the conclusion. They also showed mastery of English through good writing skills. Extract 10.1 is a sample of a students' good response to this question.

Extract 10.1

10. Explain the importance of studying Biology. Give six points.

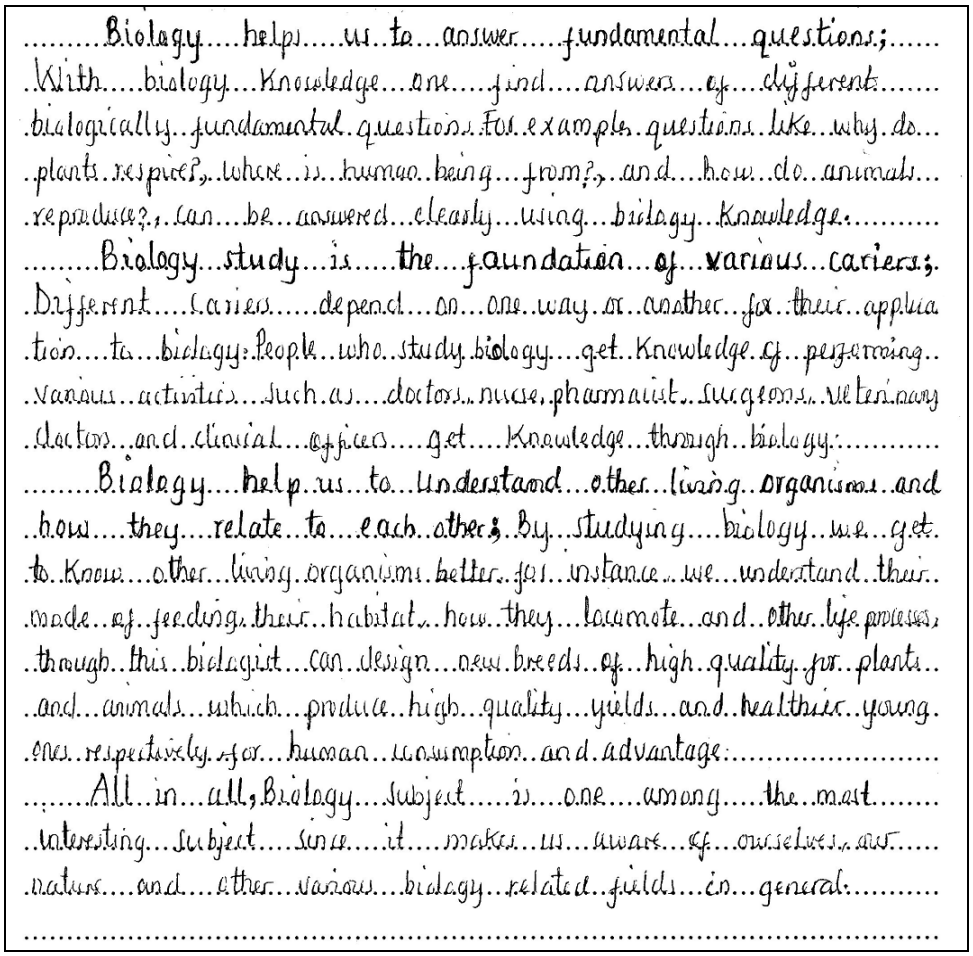
10. Biology is the study of living organisms. Also is the study of life and the processes they undergo in their life time. There are two branches of biology mainly botany: which is the study of plants and Zoology is the study of animals: Biology has many importance to human the following are some of the importance of studying biology:

Biology study help us to understand ourselves; Through studying biology a person knows who he or she is and all things that occur in him or her and the life processes he or she undergo. For example children who are in puberty get to know themselves and understand what they should do during that period of their life time:

Biology helps us to understand our environment better; By learning biology we know different activities and processes going on in our environment. Though biology knowledge we know how carbon cycle nitrogen cycle and water cycle occur in the environment:

Biology Knowledge is used to control and prevent diseases and infections; Using the knowledge gained by studying biology, biologists and scientists make various drugs medicine and vaccine for controlling different diseases that affect man and even animals. This helps to improve health of human beings.

Extract 10.1 continues


Biology helps us to answer fundamental questions; With biology knowledge one find answers of different biologically fundamental questions For example questions like why do plants respire?, where is human being from?, and how do animals reproduce?, can be answered clearly using biology knowledge.

Biology study is the faundation of various cariers; Different cariers depend on one way or another for their applica tion to biology. People who study biology get knowledge of pergorming various activities such as doctors, nurse, pharmacist, surgeons, veterinary doctors and clinical officers get knowledge through biology.

Biology help us to understand other living organisms and how they relate to each other's. By studying biology we get to know other living organisms better for instance we understand their made of feeding, their habitat, how they locomote and other life process through this biologist can design new breeds of high quality for plants and animals which produce high quality yields and healthier young ones respectively for human consumption and advantage.

All in all, Biology subject is one among the most interesting subject since it makes us aware of ourselves, our natures and other various biology related fields in general.

Extract 10.1 is a response from the student who correctly explained the importance of studying Biology. The student had good English Language proficiency.

However, 58.2 percent of the students who attempted this question obtained low (0 - 5.8) marks. Most of the students did not score full marks because they failed to demonstrate essay writing skills which require organization of essays in three sections; Introduction, Main body and Conclusion.

In the introduction, students were required to define Biology but most of the students wrote incorrect responses such as *Biology is the branch of science which deals with study of living thing and non-living thing.* In the main body, students were required to explain the importance of studying

Biology by outlining the points and give explanations but most of the students outlined the points. The students also wrote incorrect conclusion.

Moreover, some students wrote answers in Kiswahili. One of the student wrote *inatusaidia kupata manesi na madaktari "it helps us to get nurses and doctors"*. These responses imply that students lacked practices on writing essays. Extract 10.2 illustrates a response from a students who code mixed.

Extract 10.2

10. **Explain the importance of studying Biology. Give six points.**

10 Biology is the study of living things. There are

10 Biology is the study of living things. There are importance of biology in give six points fro Example of you are biology ticha, dacto, profesa.

Inatusaidia kukupatia walimu ninaposema inatusaidia kupata walimu wakufundisha shule nikwamba bila hii hapa baorojia walimu wasinge kuwapo tunge kuwa tuna subiria walimu kutoka inje yainchi nidiomaa atasaini unatusaidia kupata taa madactali.

Inatusaidia kutupatia madactali na manesi, wingi kuwapa hia hapa biology tusing kupata madactali au manesi tungekuwa tuna subiria mada ctali kutoka inchi ngingine ndiyo waje kututi bu sisi hapa ndiomana mali anisha somola bairoji.

Extract 10.2 continues

Ina kusaidia kutupatia watafiti wa magonjwa mbalimbali, ndiomaana sasahivi kuna magonjwa ambayo yana fanyiwa utafiti kama Ukimwi ambapo kuna watu natafuta dawa ya ugonjwa huo nini ni.
Ina kusaidia kutupatia wataalamu wa upasuaji. kama ugonjwa watoto kuungana vichwa au fistura na magonjwa mengine mengine yako.
Ina kusaidia kutupatia wagunduzi wa dawa mbalimbali. Kama saizi dawa zakishwa nime siki zime tokana na ubongo wa binadamu sijaua ni kweli ama ni uongo. lakini pia nina wasii wazazi muwapeleke watoto wenu shule waweze kupata elimu na waje wasaidi baadae katika maisha yenu na hata maisha yao tumuombe mungu yupo ka tuna shida tu watoto someni kwa bidii sana lakini kuna mambo yanayo nifanya mimi nipende biology ni nayo waona watu waina mbalimbali kama vile madaktari walimu maprofesa. ukisoma biology ni unaweza kupata kazi mapema nakwa ulaisi wahali yaju tofauti na wale wa nao soma kombi za arts. chaguli wangu kusome sayansi ote tutapata zaki tu zaki zipolakini watendaji ni wachache

Extract 10.2 reveals a response from a student who code-mixed the responses with Kiswahili.

2.3.2 Question 11: Health and Immunity

The question required the students to write an assay on gonorrhea, a bacterial disease caused by *Neisseria gonorrhoea* elaborating its transmission, six symptoms, six preventive measures and treatment.

The question was attempted by 9485 (1.9%) students. Data show that 74.4 percent scored from 0 to 5.5 marks, 20 percent scored from 6 to 12.5 marks whereas 5.6 percent scored from 13 to 20 marks. Figure 11 summarizes the performance of the students in this question.

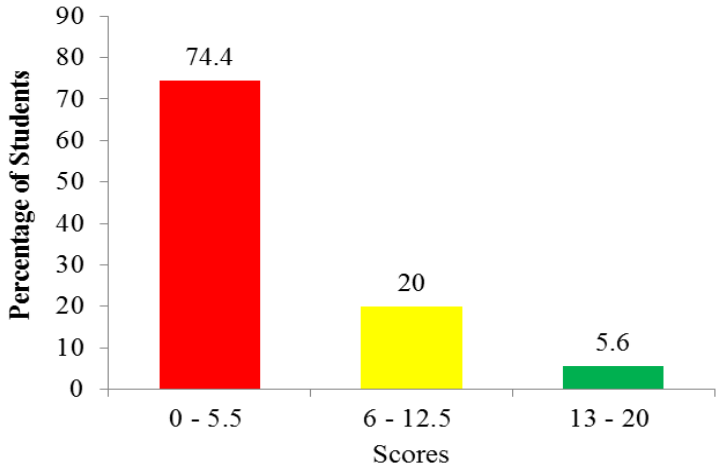


Figure 11: *The summary of students' performance in question 11.*

Figure 11 shows that the performance in this question was weak since 74.4 percent scored low marks (0 – 5.5) out of 20 marks allocated to this question. Most students who attempted this question failed to elaborate transmission, symptoms, preventive measures and treatment of gonorrhea. Some of the incorrect responses observed in the students scripts for transmission include; *sexual intercourse, sharing personal items* and *kissing.* The students also wrote incorrect symptoms such as, *frequent fever, complications during delivery, white layer in the mouth* and *frequent cough.* These students failed to understand that transmission occurs between two people if one of them is infected. These responses show that these students had insufficient knowledge of the topic of Health and Immunity, especially on Sexually Transmitted Diseases and Sexually Transmitted Infections (STDs/STIs). Extract 11.1 illustrate poor response from a student who wrote incorrect responses in all the parts. This student also code –mixed the responses with Kiswahili.

Extract 11.1

11. Gonorrhoea is a bacterial disease caused by *Neisseria gonorrhea*. Elaborate

(a) its transmission

(b) six symptoms

(c) six preventive measures

(d) its treatment.

GONORREHOEA

Gonorrhea is a bacteria disease caused by neisse rial Elaborate gonorrhea is a bacter in sick of people and childlen mother and father and sister, brother

its transimision

transimision of bacteria is the transimision which produce Elaborate and Neisseria gonorr hea in childler and people and toiled kuw achafu nayo kunaweza kusema inaweea kusa babisha kwa ugonjwa huu is gonorrhea

Six Symptoms

Symptoms is System of gonorrhea and bac teria that produce Elaborate

• Toilate

Toilete is the symptoms of bacteri and gono rrea becauce Student huwa nanakumia Vyoo Vitatu kwawakati mmoja iwakati hua huo wana zidi hata elfu moja hapahapo ndo chanza kumbe tunaweea kusema chao ni chanzo cha gondea pamoja na uchafu

Extract 11.1 continues

Student is produce gonorrhea and home
Soptitah government and car load marke
t and Sop shoping

preventive measures

: Me and my friend to preventive measures
the people No uchafu wamazingira and local
people in wachafudhi wamazingira nao tunawe
za kusema pamoja na govermedend and Market

It is treatment

bacteri his so treatment of gonorrhea and prina
plice and wich rid to west materiaℓ

• west is the material which by produce wes
t disposary and heath is the body of materiaℓ
and health immunity disease and treadment of
Contable disease

• Malaria

Malaria is endemic disease
Source of malaria Source of malaria in
alopheles and anopheles man and anopheles
women anopheress woman it is produce
malalia to a Sick kingdom animal and
plantae of human giuestive system

gonorrhea is the bacteria which produce
by Elemia and bacteria of the home and
pandemic diseade

Extract 11.1 is a response from a student who wrote incorrect responses on the transmission, symptoms, preventive measures and treatment of gonorrhoea. In addition, he/she code-mixed the responses with Kiswahili.

The students who scored good marks (13 - 20) in this question had adequate knowledge of the topic of Health and Immunity. The students also demonstrated good command of the English language and essay writing skills. Extract 11.2 is a sample of a students' good response in this question.

Extract 11.2

11. Gonorrhoea is a bacterial disease caused by *Neisseria gonorrhea*. Elaborate

(a) its transmission

(b) six symptoms

(c) six preventive measures

(d) its treatment.

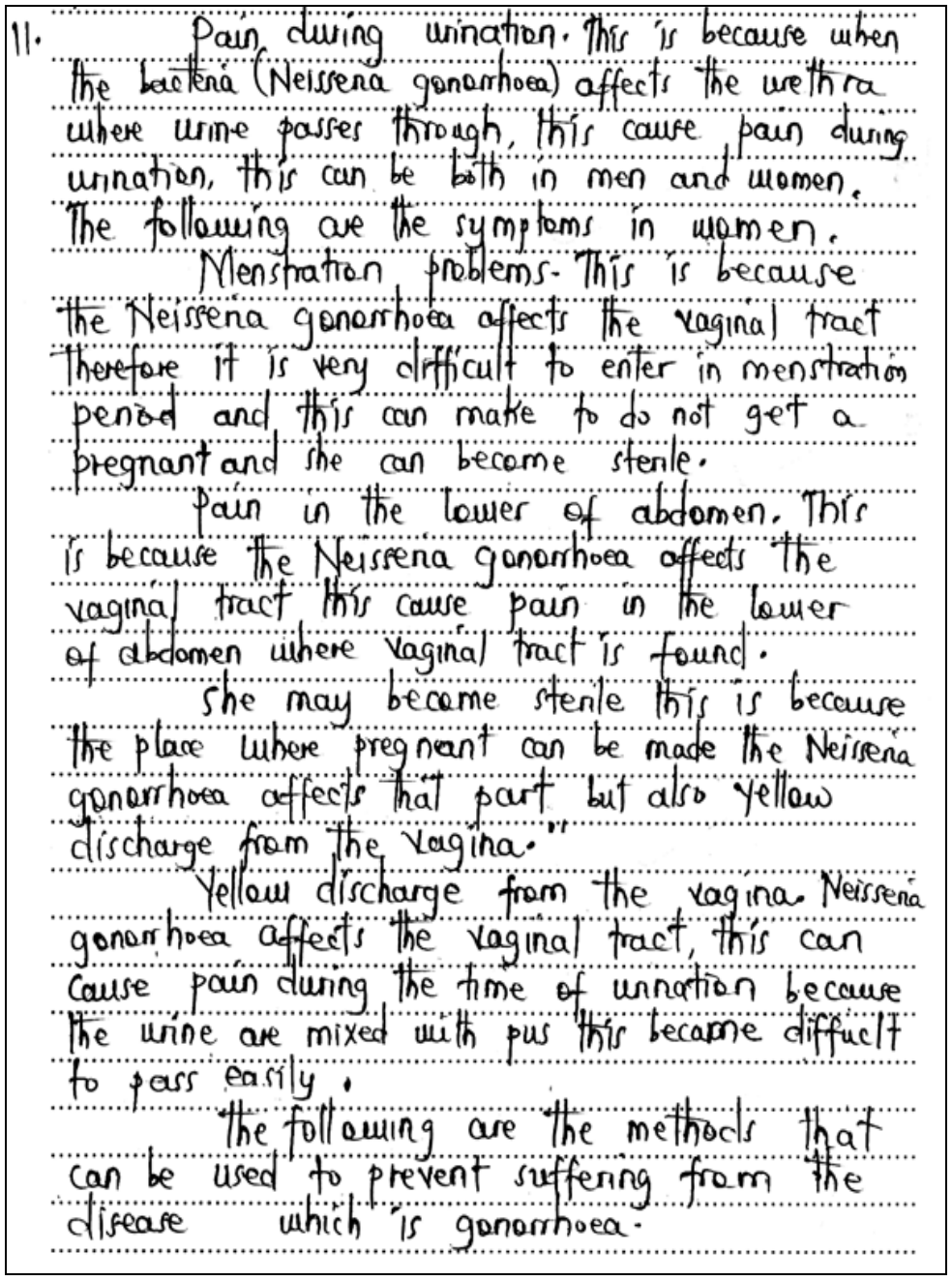
11. Gonorrhoea refers to the bacterial disease that is caused by bacterium known as Neissena gonorrhoea. Neissena gonorrhoea affects the urethra in men and vagina| tract in women.

Gonorrhoea is the disease that is transmitted through sexual intercourse with infected men and women. The neissena gonorrhoea affects the part of women and men.

The following are the symptoms of gonorrhoea that can be shown when ones suffering from gonorrhoea. These symptoms are divided into two groups that in men and women. The following are the symptoms in men.

Drops of pus from the penis. This is because neissena gonorrhoea affects the urethra in men. These bacteria, they destroy the urethra where urination passes, this cause the removing of drops of pus from the penis.

Extract 11.2 continues



11. Pain during urination. This is because when the bacteria (Neissena gonorrhoea) affects the urethra where urine passes through, this cause pain during urination, this can be both in men and women. The following are the symptoms in women.

Menstration problems. This is because the Neissena gonorrhoea affects the vagina) tract therefore it is very difficult to enter in menstration period and this can make to do not get a pregnant and she can become sterile.

Pain in the lower of abdomen. This is because the Neissena gonorrhoea affects the vagina) tract this cause pain in the lower of abdomen where vagina) tract is found.

She may become sterile this is because the place where pregnant can be made the Neissena gonorrhoea affects that part but also yellow discharge from the vagina."

Yellow discharge from the vagina. Neissena gonorrhoea affects the vagina) tract, this can cause pain during the time of urination because the urine are mixed with pus this became difficlt to pass easily.

The following are the methods that can be used to prevent suffering from the disease which is gonorrhoea.

Extract 11.2 continues

11. Avoid engage in sexual intercourse. This is because, since the Neissena gonorrhoea are transmitted during sexual intercourse and affects the urethra in men and vagina tract therefore we should avoid engage in sexual intercourse.

Use of Condom. Since the disease is transmitted through sexual intercourse we can use condom to prevent the transmission of the bacteria that cause disease.

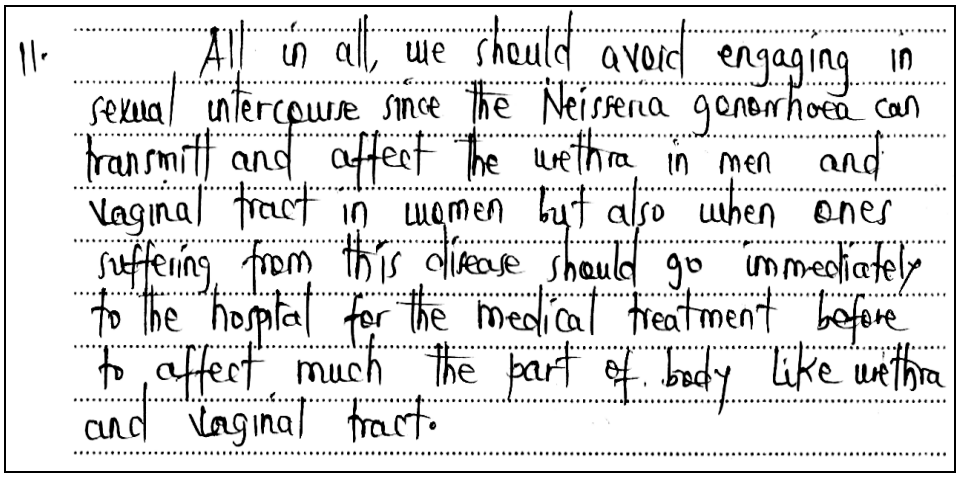
Avoid sharing things like towels. This is because when a person is suffering from this disease can use towels to remove (clean) the pus or discharge that are come from the vagina and penis then one comes to use it, therefore the bacteria (Neissena gonorrhoea) can transmitt or spread.

Avoid sharing clothes especially under wear. There is high possibility of the bacteria to transmitt from the infested person to another person.

Use of antibiotic like streptomycin. This is the medicine that manufactured from bacteria and can be used to cure this disease.

This disease can be treated by using medicine like streptomycin. Therefore when ones suffering from this disease immediately should go to the hospital for medical treatment before the Neissena gonorrhoea to affect much the part like urethra in men and vagina tract in women, because when this disease affects the men and women, both of them can become sterile and cannot get child since the place where pregnant can be made has been already affected by the bacteria.

Extract 11.2 continues


11. All in all, we should avoid engaging in sexual intercourse since the Neisseria gonorrhoea can transmitt and affect the urethra in men and vagina tract in women but also when ones suffering from this disease should go immediately to the hospital for the medical treatment before to affect much the part of body like urethra and vagina tract.

Extract 11.2 is a response from the student who answered the question correctly.

3.0 ANALYSIS OF THE STUDENTS' PERFORMANCE PER TOPIC

The analysis of the students' performance in Biology FTNA 2018 topic-wise shows that out of the 9 topics assessed question (2) had the highest performance of 97.3 percent. This was a True/False question derived from the topics of *Health and Immunity, Introduction to Biology, Classification of Living Things, Balance of Nature, Gaseous Exchange and Respiration, Transport of Materials in Living Things, Nutrition, Cell Structure and Organization* and *Safety in Our Environment.* The second highest performance was observed in question (1) (85%) which consisted of Multiple Choice Items derived from the topics of *Nutrition, Balance of Nature, Transport of Materials in Living Things, Introduction to Biology, Safety in Our Environment, Gaseous Exchange and Respiration, Cell Structure and Organization, Health and Immunity* and *Classification of Living Things.* This was followed by question (5) from the topic of Cell Structure and Organization with the performance of 68.9 percent.

The topics with average performance were; *Transport of Materials in Living Things (64.5%), Balance of Nature (46.8%), Introduction to Biology (41.8%)* and *Classification of Living Things (39.8).*

The topics with weak performance were *Safety in Our Environment (28.25), Health and Immunity (25.6%), Gaseous Exchange and Respiration*

(23.8%) and *Nutrition (7.1).* Appendix 1 presents a summary of students' performance in the FTNA 2018, where weak performance is represented by red color, average performance by yellow color and good performance by green color with the percentage of the students who scored from 30 percent or above of the marks allocated to the question ranging from 0-29%, 30-64% and 65-100% respectively.

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

This analysis of the students' responses reveals a number of factors that may have affected performance. These factors include:

(a) Lack of adequate knowledge of the topics tested. It is evident that students do not revise Form One and Form Two topics before the commencement of the FTNA assessment.

(b) Failure of students to understand demands of the questions. Some students rushed to attempt the questions without reading them thoroughly.

(c) Misspelling in writing of the scientific terms. This was evident in responses to question 8 part (b) which required the students to outline the Phyla of Kingdom Fungi. Most students misspelt the terms.

(d) English Language barrier is another factor that caused students to fail to express their responses clearly. In some cases, the students failed to understand the demands of the question due to this factor.

(e) Most students skipped question number (9) from the topic of Gaseous Exchange and Respiration. This indicated that teachers did not cover the topic since it is the last topic in form two syllabus.

4.2 Recommendations

Based on the findings from Students Item Response Analysis (SIRA); the following are suggested so as to improve performance in Biology subject:

(a) Teachers should use various teaching strategies and techniques that will make students inquisitive.

(b) Students should read questions carefully before answering in order to understand respective requirements.

(c) Teachers should assess students' achievement on continuous basis so that they get feedback on weaknesses in advance. This will enable teachers to help students improve their learning before sitting for FTNA.

(d) Teachers should adopt English speaking policy via activities such as debates, reading novels, and speaking English in schools all the time. This will improve proficiency in the English language.

(e) Teachers should ensure that they cover all the Form I and II topics in order to provide enough time for revision before the students sit for the Form two national assessment.

Appendix

Students' Performance Topic - wise in FTNA - 2018

S/N	Topic	FTNA 2018		
		Question Number	Percentage of Students who Scored from 30% or above	Remarks
1.	True and False items; (Health and Immunity, Introduction to Biology, Classification of Living Things, Balance of Nature, Gaseous Exchange and Respiration, Transport of Materials in Living Things, Nutrition, Cell Structure and Organization na Safety in Our Environment.)	2	97.3	Good
2.	Multiple choice items (Nutrition, Balance of Nature, Transport of Materials in Living Things, Introduction to Biology, Safety in Our Environment, Gaseous Exchange and Respiration, Cell Structure and Organization, Health and Immunity and Classification of Living Things)	1	85	Good
3.	Cell structure and organization	5	68.9	Good
4.	Transport of Materials in Living Things	3	64.5	Average
5.	Balance of nature	6	46.8	Average
6.	Introduction to Biology	10	41.8	Average
7.	Classification of living things	8	39.3	Average
8.	Safety in Our Environment	4	28.2	Weak
9.	Health and immunity	11	25.6	Weak
10	Gaseous Exchange and Respiration	9	23.8	Weak
11	Nutrition	7	7.1	Weak