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) 2021

AGRICULTURE

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034 AGRICULTURE

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FOREWORD

This report is written in response to the 2021 Form Two National Assessment results in the Agriculture subject. The report provides feedback to students, teachers, parents, policymakers and other education stakeholders on the students' performance in this subject.

The FTNA is a formative evaluation in secondary education which, among other things, shows the effectiveness of the education system in general and the education delivery system in particular. Essentially, students' responses in the assessment strongly indicate what the education system offered or did not offer to the students in their two years of study.

The report analyses students' performance based on the responses provided. Generally, statistics show that most of the students had weak performance in this year's assessment. The report attributes this performance to several reasons, including poor mastery of the topics assessed, inability to meet the requirements of the questions and failure to respond per the requirements of the questions. In addition, most of the students who attained weak performance exhibited poor essay writing skills.

Nevertheless, few students had good performance. These demonstrated good understanding of the subject matters in the topics assessed and they met the demands of the questions. The students also responded correctly to the requirements of the questions and possessed good essay writing skills.

In view of this, the report offers recommendations on how to improve students' performance in the future assessments administered by the Council. It is expected that the feedback provided in this report will enable education stakeholders to take proper measures to enhance the teaching and learning process and improve students' performance.

The Council would like to thank all examination officers, examiners and those who participated in preparing this report.

Dr. Charles E. Msonde
EXECUTIVE SECRETARY

1.0 INTRODUCTION

This report analyses the performance of the students who sat for the 2021 Form Two National Assessment in the Agriculture subject. The assessment was set according to the assessment format issued in 2021, which is based on the 2019 Agriculture Syllabus.

The assessment had one theory paper of 2:30 hour duration, consisting of ten questions in Sections A, B, and C. The students were required to answer all questions. Section A had two objective questions: Multiple Choice items in Question 1 and Matching items in Question 2. Question one carried 10 marks, and Question two carried 5 marks, making a total of 15 marks.

Section B consisted of seven short answer questions. Each carried 10 marks, making a total of 70 marks. Section C comprised one essay question, carrying 15 marks.

The National Assessment results for the subject in this year depict weak performance. The students who sat for the assessment were 21,721. Among them 5,794 (26.68%) passed and 15,920 (73.32%) failed, with 7 students having their results withheld. This shows that the performance of the student in the Agriculture subject in the 2021 Form Two National Assessment has dropped by 4.89 per cent compared to 2020. Table 1 summarises the students' performance by grades.

Table 1: Students' Performance by Grades in FTNA 2021

Grades	**A**	**B**	**C**	**D**	**F**	**Withheld**	**Total**
Male	51	206	1,411	1,856	6,263	6	9,793
Female	4	60	746	1,460	9,657	1	11,928
Total	55	266	2,157	3,316	15,920	7	21,721

Source: NECTA Statistics Book FTNA 2021:6

The following section analyses the students' performance on each question. The analysis highlights the requirements of each question, the general performance of the students on each question, their responses and possible reasons for their performance. The analysis also contains the presentation of

extracts for each question to demonstrate samples of the correct and incorrect responses to each question.

The students' results in this assessment were categorised into five grades (A, B, C, D and F). Each grade had a respective score interval and remark such as A (75-100) Excellent, B (65-74) Very good, C (45-64) Good, D (30-44) Satisfactory and F (0-29) Fail. Furthermore, this analysis has categorised the performance into three categories, namely good (65-100), average (30-64) and poor (0-29). Three colours (green, yellow and red) have been used to indicate good, average and weak performance levels, respectively.

2.0 THE ANALYSIS OF THE STUDENTS' PERFORMANCE IN EACH QUESTION

2.1 SECTION A: OBJECTIVE QUESTIONS

2.1.1 Question 1: Multiple Choice Items

The question consisted of ten multiple choice items derived from different topics in the Agriculture Syllabus. Each item carried 1 mark, making a total of 10 marks. The students were required to choose the correct answer from the given alternatives and write its letter in the box provided.

The question was attempted by 21,720 (100%) students whereby 5,845 (26.9%) scored from 0 to 2 marks, 14,612 (37.5%) scored from 3 to 6 marks and 1,263 (5.8%) scored from 6.5 to 10 marks. The students' general performance on the question was good. Figure 1 shows the distribution of students' scores in the question.

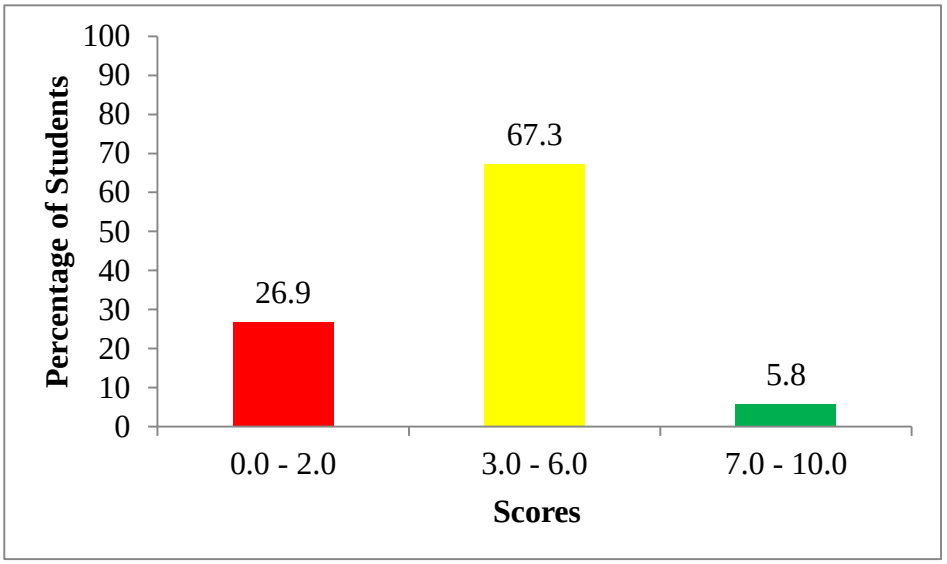


Figure 1: *Students' Performance on Question 1*

Figure 1 shows that 73.1 per cent of the students scored from 3 to 10 marks, and 26.9 per cent scored from 0 to 2 marks. Their responses indicate that most of the students attempted correctly item (i), (ii), (iii), (iv), (v), but attempted item (vi), (viii), (ix) and (x) wrongly. The analysis of students' responses to each item is as follows:

Item (i) required the students to choose an alternative which best described the contribution of agriculture to both the economy of a country and family. The item tested the students' understanding of the role of agriculture in the economy. The correct option was B (Supply of food and source of income). The distractors were A (Provision of raw materials and offers employment), C (Provision of raw materials and source of income) and D (Source of income and offers employment). Most of the students chose the correct option signifying that they were familiar with the contribution of agriculture to the economy of a country and family. Alternatives A, C and D were distractors because they had pairs of responses in which one item was the contribution of agriculture to either the economy of the country or family.

Item (ii) required the students to choose the reason why cotton should not be regrown after being harvested but beans is to be planted. The item assessed the students' knowledge and skills in crop rotation as a means of maintaining soil fertility. The correct option was D, (heavy feeder crop).

The incorrect options were A (light feeder crop), B (medium feeder crop) and C (very light feeder crop). The majority of the students chose the correct answer. This indicates that they were knowledgeable about and skilled in the principles of crop rotation. Cotton, being a heavy feeder crop, had utilized a lot of nutrients in the soil. Hence, growing it again would deplete more nutrients. Therefore, a bean, which is a light feeder crop, should be grown after harvesting cotton.

Item (iii) required the students to choose an alternative which was not the characteristic of nomadic pastoralism which involves movement of animals from one place to another searching for water and pasture. The item tested the students' knowledge of livestock farming systems. The correct answer was B (practised in areas with heavy rainfall). The distractors were A (done in communal land), C (keep large groups of livestock) and D (cannot be done in areas with high populations). Most of the students attempted the item correctly. This indicates that they had a good understanding of the system of nomadic pastoralism. The system cannot be practised in areas with heavy rainfall; instead, it is done in arid areas where cultivation of pasture crops is difficult. All the distractors had the characteristics of nomadic as one of the systems of livestock farming. Hence they were not correct.

Item (iv) required the students to choose an option representing other characteristics of clay soil rather than being sticky when wet and hard when dry. The item assessed the students' understanding of the characteristics of different types of soil. The correct answer was A (Drain slowly and difficult to cultivate). The distractors were B (Well aerated and low fertility), C (Drains slowly and well aerated) and D (Well aerated and difficult to cultivate). Most of the students correctly answered the item. This signifies that they had good mastery of the subject matter. The particles in clay soil are small and tightly packed together. Therefore, water drains through it slowly and workability of the soil is difficult. Alternatives B, C and D were not correct due to the following reasons: B had a pair of responses which were characteristics of sand soil and not clay, while C and D had pairs of responses in which one was the characteristic of sand soil and the other of clay soil.

Item (v) required the students to choose an option that described the properties of a soil sample that holds much water. The item assessed the students' understanding of the characteristics of different types of soil. The correct answer was C (Small sized particles and particles closely packed together). The incorrect options were A (Large sized particles and particles closely packed together), B (Small sized particles and particles loosely packed together) and D (Large sized particles and particles loosely arranged). Most of the students provided the correct answer. This shows that the students had adequate knowledge of the characteristics of the types of soil. The soil that holds much water is clay soil, and it is characterised by having small particles that are closely packed together. Alternatives A and B were incorrect since they had pairs of responses which were the characteristics of both sand and clay soil, while D had pair of responses which were the characteristics of sand soil.

Item (vi) required the students to choose an option that explained the functions that had not been performed by an entrepreneur when deciding not to produce crops as a result of the shortage of rainfall in the last season. The item tested the students' understanding of the role of an entrepreneur. The correct option was D (Risk taking). The distractors were A (Organization), B (Implementation), and C (Planning). Most of the students attempted the item incorrectly. This justified that the students had inadequate knowledge of the role of an entrepreneur in the farming business. Risk taking involves decision to do something without exactly knowing its outcome. The entrepreneur did not take risk because of the loss obtained in the last season. Most of the students chose option B since it involved undertaking the production plans. The students who chose option A did not understand that organization refers to mobilization of the resources to be used in the production process. Those who chose option C failed to understand that planning means selecting the enterprise to undertake, setting the production goals, and identifying the means of achieving the goals.

Item (vii) required the students to choose an alternative that represented the methods of harvesting cassava. The item tested the students' knowledge of different crop husbandry practices. The correct answer was A (Uprooting and digging). The incorrect answers were B (Picking and digging), C (Uprooting and picking) and D (Picking and shaking). The majority of the students provided the correct answer to this item. This implies that the

students were conversant with the methods of harvesting cassava. Cassava is an underground stem. Thus, in order to harvest it, one should either uproot or dig the crop. Options B, C and D were incorrect since they had pairs of responses in which one or both were methods of harvesting crops which are found above the ground.

Item (viii) required the students to choose an option that showed the cause of decline in value of a tractor after ten years. The item assessed the students' understanding of the causes of depreciation of farm assets. The correct answer was C (Wear and tear). The distractors were A (Obsolescence), B (Usage rights) and D (Perishability). Most students answered the item incorrectly. This suggested that the students had inadequate knowledge of the causes of depreciation of farm assets. Wear and tear is the damage which occurs to assets due to aging, causing decline in the value of the assets. Most of the students chose option A; they failed to understand that obsolescence is the process of assets being outdated and no longer in use, which is not the cause of decline in value of assets. Option B was incorrect because usage rights simply mean rights granted to the user of the assets by the manufacturer for a particular period. Option D was incorrect because a tractor is not a perishable good. Perishability is the state of a product to go bad easily.

Item (ix) required the students to choose an alternative which is a question to be asked before introducing a new enterprise in the organization. The item tested the students' knowledge about production decisions. The correct answer was C (How to produce). The incorrect alternatives were A (How much to produce), B (When to produce) and D (What to produce). Most of the students provided incorrect answers to this item. This justifies that the students were not knowledgeable about production decisions. When introducing a new enterprise, one should first determine the combination of inputs to be used in production (how to produce). The majority of the students chose option D, which was incorrect. Deciding what to produce, either one product or several is the first decision that comes when one wants to start a farming business but not the first decision when introducing a new enterprise in the farming business. Options A and B were incorrect because deciding how much to produce and when to produce comes after having decided what and how to produce when establishing a farming business.

In item (x), the students were required to choose an option that represents the disease in maize plants which show masses of orange brown spores on the leaves and on the green tender leaves of plants. The item tested the students' ability to identify plant diseases based on their signs and symptoms. The correct answer was D (Rust). The incorrect alternatives were A (Powdery mildews), B (Downy mildews) and C (Wilt). Most of the students failed to identify the disease with the stated visible sign. This indicates that the students lacked knowledge of and skills in identifying diseases in maize plants based on visible signs. Most of the students opted for B which was not correct because downy mildew is characterised by elongated chlorotic streak with a downy growth of conidia and conidiophores. The students who chose option A did not know that powdery mildew does not affect maize plants; rather, it mostly affects vegetables and ornamental crops. Option D was incorrect since wilting is characterised by wilting of the leaves in lower parts of the plant and turn dull green folding inwards.

2.1.2 Question 2: Matching Items

The question comprised five items from the topic of Introduction to Crop Production. Each item carried 1 mark, making a total of 5 marks. The students were required to match the items in List A with their corresponding responses in List B by writing the letter of the correct response from List B below the corresponding item number in List A. List A consisted of five practices of cropping systems whereas List B consisted of seven types cropping systems. The question tested the students' understanding of different types of cropping systems.

List A	List B
(i) Growing any one annual crop in the field. (ii) Growing the same crop in the field. (iii) Growing different types of crops randomly in the field. (iv) Growing different types of crops in a specific and systematic pattern in the field. (v) Growing different types of crops on the same piece of land in sequence.	A Crop rotation B Mixed cropping C Mono-cropping D Mult-storey cropping E Monoculture F Intercropping G Interlining

The question was attempted by 21,720 (100%) students. Among them, 7,933 (36.5%) scored from 0 to 1 mark; 8,130 (37.5%) scored from 2 to 3 marks; and 5,657 (26%) scored from 4 to 5 marks. The general performance on the question was average. Figure 2 show the distribution of students' scores in the question.

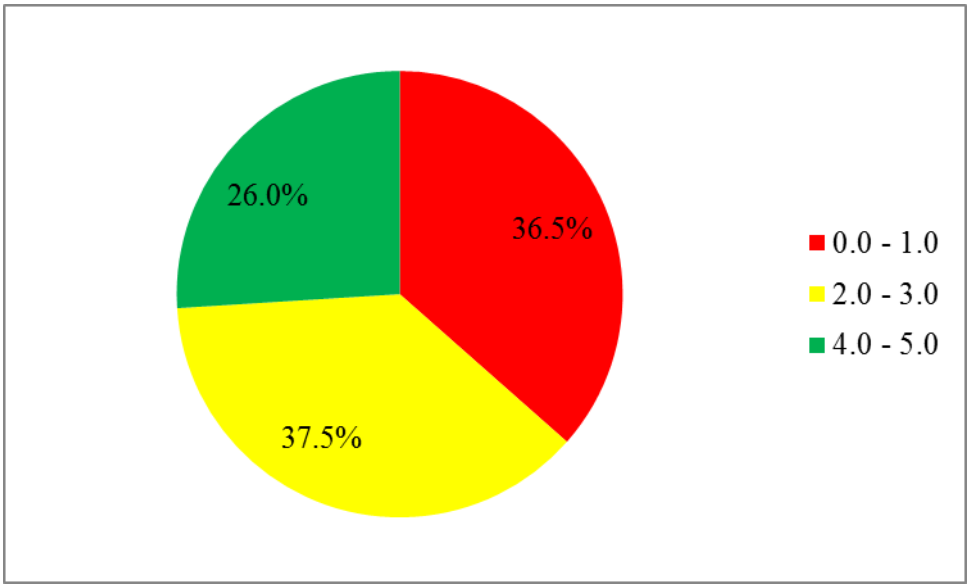


Figure 2: *Students' Performance on Question 2*

Figure 2 shows that 63.50 per cent of the students scored from 2 to 5 marks and 36.5 per cent scored from 0 to 1 mark. Their responses showed that most of them correctly attempted the item (i), (ii), (iii), and (iv) but incorrectly item (v). The analysis of the students' responses to each item is as follows:

In item (i), the majority of the students chose the correct response, which was C (mono-cropping), as the system of cropping which involve growing of any one annual crop in the field. This indicates that the students had adequate knowledge of mono-cropping. Some of the students incorrectly chose E (monoculture). These students mixed up the two cropping systems as monoculture is the growing of the same crop in the field.

In item (ii), most of the students chose the correct response, which was E (monoculture), as the system of growing the same crop in the field. These students showed good understanding of the monoculture cropping system. Most of the students who provided incorrect responses chose C (mono-cropping). They mixed up the two cropping systems.

In item (iii), the majority of the students provided the correct response, which was B (mixed cropping), as the growing of different types of crops randomly in the field. The students exhibited good understanding of the mixed cropping system. The students who provided incorrect responses were mostly attracted to F (intercropping). This is the system of growing different types of crops in a specific and systematic pattern in the field.

In item (iv), the majority of the students provided the correct response, which was F (intercropping), the systematic growing of different types of crops in a specific and systematic pattern in the field. This implies that they were knowledgeable about the intercropping system. Most of the students who responded incorrectly to this item mixed up intercropping and mixed cropping thus opting for B.

In item (v), the majority of the students provided incorrect responses regarding the system of growing different types of crops on the same piece of land in sequence. The correct response was A (crop rotation). Most of them selected G (inter-planting), which means growing different types of crops in the same field. The students lacked knowledge of crop rotation.

2.2 SECTION B: SHORT ANSWER QUESTIONS

2.2.1 Question 3: Introduction to Soil Science

The question comprised parts (a) and (b), carrying a total of 10 marks. The following scenario was given: Laboratory soil analysis was done to determine infiltration rates of three soil samples: sand, clay and loam with the same weight using an equal volume of water. Giving reason in each case, the students were required to state: (a) (i) the soil with low infiltration rate, (ii) the soil with high infiltration rate and (iii) the soil with moderate infiltration rate. Part (b) required the students to suggest by giving three reasons the type of soil sample in part (a) that is suitable for production of most crops. The question tested the students' ability to analyse physical properties of different soil type.

The question was attempted by 21,721 (100%) students; out of which, 17,933 (82.6%) scored from 0 to 2.5 marks, 2,745 (12.6%) scored from 3 to 6 marks and 1,043 (4.8%) scored from 6.5 to 10 marks. The general performance on the question was weak. Figure 3 illustrates the distribution of students' scores in the question.

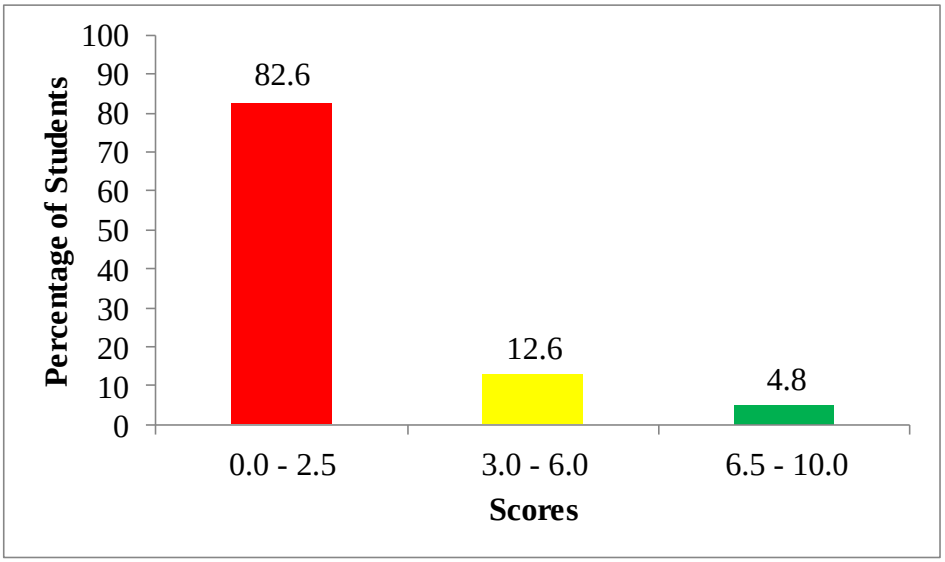


Figure 3: *Students' Performance on Question 3*

Figure 3 shows that majority of the students (82.6%) scored from 0 to 2.5 marks, and 17.4 per cent scored from 3 to 10 marks. The analysis of their

responses showed that most of the students who had weak performance provided incorrect responses to almost all parts of the question. In part (a), they failed to state and give reasons for the types of the soil samples with low, high and moderate infiltration rates. Some of the students had a misconception about infiltration rate and confused it with water holding capacity. Thus, the responses provided focused on the ability of the soil to retain water. For example, they named the soil with low infiltration as sand and that with high infiltration as clay. The students did not understand that the infiltration rate refers to the speed of water to pass through the soil. Other students, despite failing to state types of soil sample with low, high and moderate infiltration rates, failed to give reasons to support their answers. Examples of the incorrect responses provided were (i) The soil with low infiltration rate is *loam*/*sand*. Reasons: *Holding of water capacity is very low, aggregation or arrangement of individual soil particles, is the types of infiltration rate which cannot take high volume of water, used agriculture in the earth and are sample of the same weight.* (ii) The soil with high infiltration rate is *clay*/*loam*. Reasons: *We get mineral from this soil sample, is the source of soil for practical's in the laboratory, water does not have particles closely packed together and high filtration rate cause soil erosion*. (iii) The soil with moderate infiltration rate is *clay*/*sand*. Reasons: *is the soil formation, it is caused by irrigation, it occurs in the rivers area* and *there are no pore spaces.*

Furthermore, in part (b), the students failed to suggest and give reasons for the type of soil sample in part (a) that is suitable for the production of most crops. They provided responses such as type soil-*sand*/*clay*. Reasons: *The soil has same weight, stone soil is suitable for production, it controls high yield production of crops and it lack nutrients for crop production*. The responses provided indicate that the students lacked knowledge about physical properties of different soil type. Extract 1.1 is a sample of the incorrect responses to the question.

3. (a) Soil analysis was conducted in the laboratory to determine infiltration rate of the three soil samples which were sand, loan and clay. The samples of the same weight were taken and equal volume of water was used. Giving reason in each case, state which soil sample had

(i) low infiltration rate.

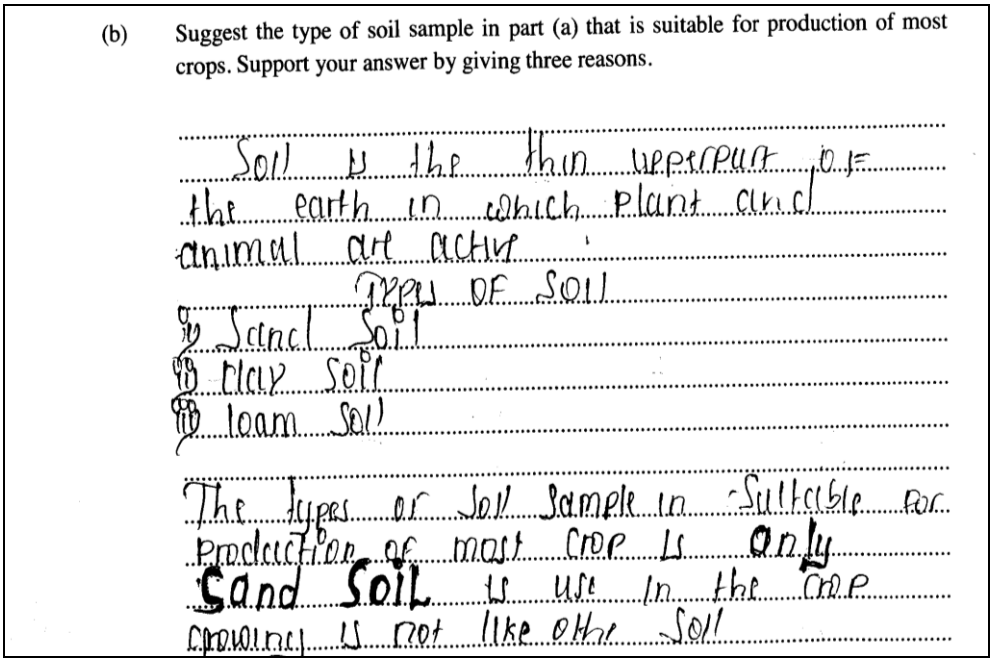
Sand Soil is the soil where which will be usesud in the Process of of Factor it high earcited It help water to enter in the soil

(ii) high infiltration rate.

This Soil is where by the soil which is high Finfiltration rater. is the Soil which have all characteristic which can have the Soil

(iii) moderate infiltration rate.

This is where by the soil which have or Soil have the Point of Moderate Infiltration rate This is where by that Soil is moderate


(b) Suggest the type of soil sample in part (a) that is suitable for production of most crops. Support your answer by giving three reasons.

Soil is the thin upperpart of the earth in which plant and animal are active

TYPES OF SOIL

i) Sand Soil
ii) Clay Soil
iii) loam Soil

The types of soil sample in suitable for production of most crop is only Sand Soil is use in the crop growing is not like other Soil

Extract 1.1: *A Sample of the Incorrect Responses in Question 3*

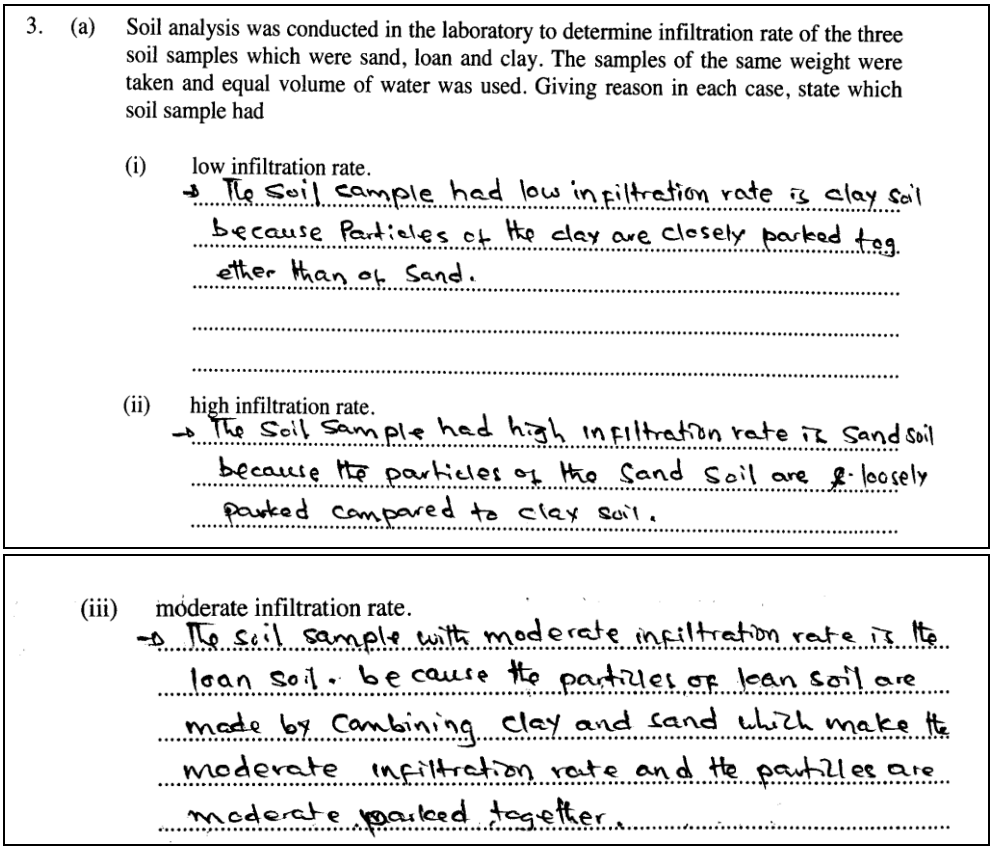
Extract 1.1 shows responses from a student who incorrectly attempted both parts of the question. In part (a), the student failed to state and give reasons for the types of soil with low, high and moderate infiltration rates. In part (b), he/she suggested sand instead of loam as the type soil suitable for the production of most crops. The students also failed to give reasons for the given suggestion.

Analysis indicates that 12.6 per cent of the students who attempted the question performed averagely. Most of them failed to state and give reasons for the types of soil with low and high infiltration rates in parts (a) (i) and (ii) respectively. In part (a) (iii), they correctly named the type of soil with moderate infiltration rate but failed to give reasons. In part (b), the students correctly suggested loam as the suitable soil for production of most crops but failed to give reasons for the suggestion. This suggests that the students had partial understanding of the physical properties of different soil types.

In contrast, 4.8 per cent of the students had good performance on the question. The analysis shows that most of them correctly responded to almost all parts of the question. In part (a), they correctlty stated and gave reasons for the types of soil with low, high and moderate infiltration rates.

For example, in part (a) (i), clay soil has low infiltration rate because it has small particles, closely packed together (ii) sand soil has high infiltration rate because it has large particles which are loosely arranged, and (iii) loam soil has moderate infiltration rate because it contains a mixture of sand and clay, thus making average-sized pore spaces.

Likewise, in part (b), the majority of the students correctly suggested the type of soil sample which is suitable for production of most crops and gave correct reasons for the suggestion. For example, the suitable soil for the production of most crops is loam. Reasons: *The soil has moderate water holding capacity since moderate soil moisture content is required for optimum crop production, it is fertile and does not limit the availability of nutrient and it is moderately aerated and allow easy root penetration and plant growth*. The responses provided indicated that the students had adequate knowledge of the physical properties of different soil types. Extract 1.2 is an example of the correct responses to the question.



3. (a) Soil analysis was conducted in the laboratory to determine infiltration rate of the three soil samples which were sand, loan and clay. The samples of the same weight were taken and equal volume of water was used. Giving reason in each case, state which soil sample had

(i) low infiltration rate.

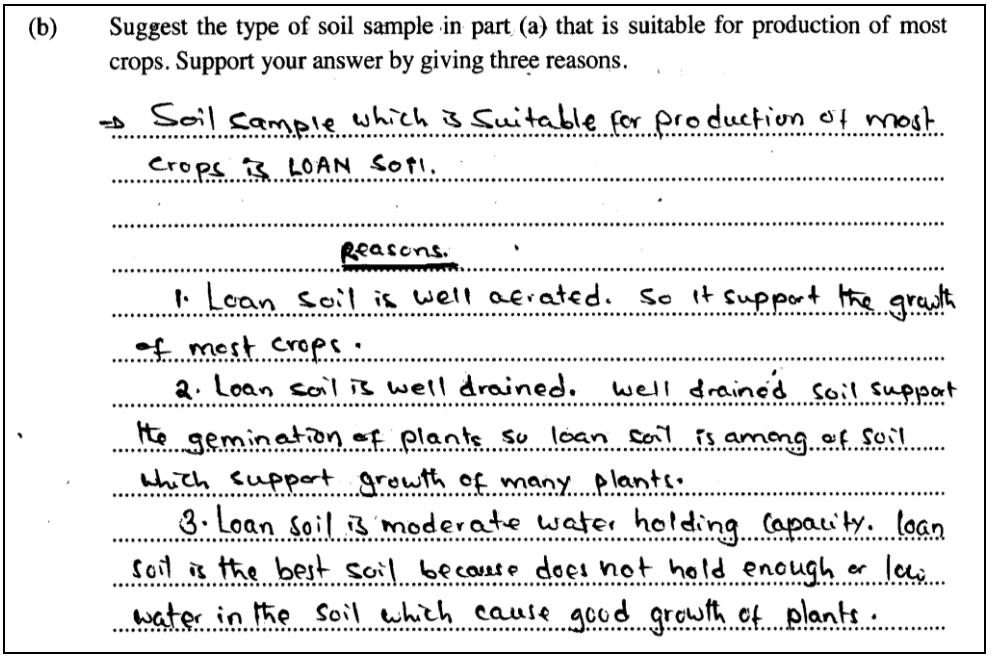
→ The soil sample had low infiltration rate is clay soil because Particles of the clay are closely parked together than of Sand.

(ii) high infiltration rate.

→ The soil sample had high infiltration rate is Sand soil because the particles of the Sand soil are loosely parked compared to clay soil.

(iii) moderate infiltration rate.

→ The soil sample with moderate infiltration rate is the loan soil. because the particles of loan soil are made by Combining clay and sand which make the moderate infiltration rate and the particles are moderate parked together.


(b) Suggest the type of soil sample in part (a) that is suitable for production of most crops. Support your answer by giving three reasons.

→ Soil sample which is suitable for production of most crops is LOAN soil.

Reasons.

1. Loan soil is well aerated. So it support the growth of most crops.

2. Loan soil is well drained. well drained soil support the gemination of plants so loan soil is among of soil which support growth of many plants.

3. Loan soil is moderate water holding capacity. loan soil is the best soil because does not hold enough or less water in the soil which cause good growth of plants.

Extract 1.2: *A Sample of the Correct Responses to Question 3*

Extract 1.2 present responses from a student who correctly responded to both parts of the question. The student demonstrated good understanding of the physical properties of different soil types.

2.2.2 Question 4: Principles of Crop Production

This question carried 10 marks. It required the students to give four reasons for the advice given to farmers by the extension officer in Lindi Region to choose composite seeds to cultivate maize instead of hybrid seed varieties. The question assessed the students' knowledge about the characteristics of seed varieties.

The question was attempted by 21,721 (100%) of the students. Among them, 20,261 (93.3%) scored from 0 to 2.5 marks; 1,242 (5.7%) scored from 3 to 6 marks; and 217 (1%) scored from 6.5 to 10 marks. The general performance on the question was weak. Figure 4 shows the distribution of students' scores in the question.

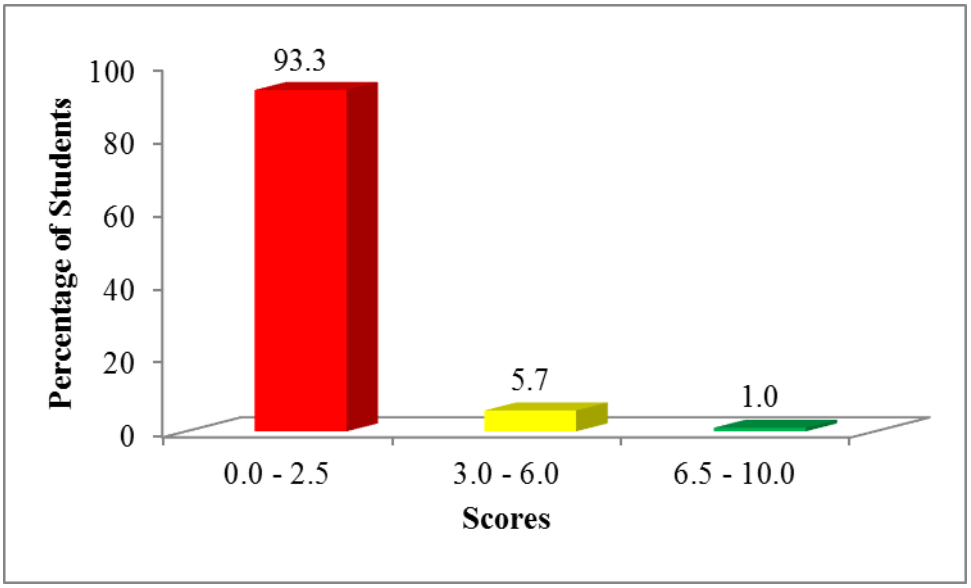
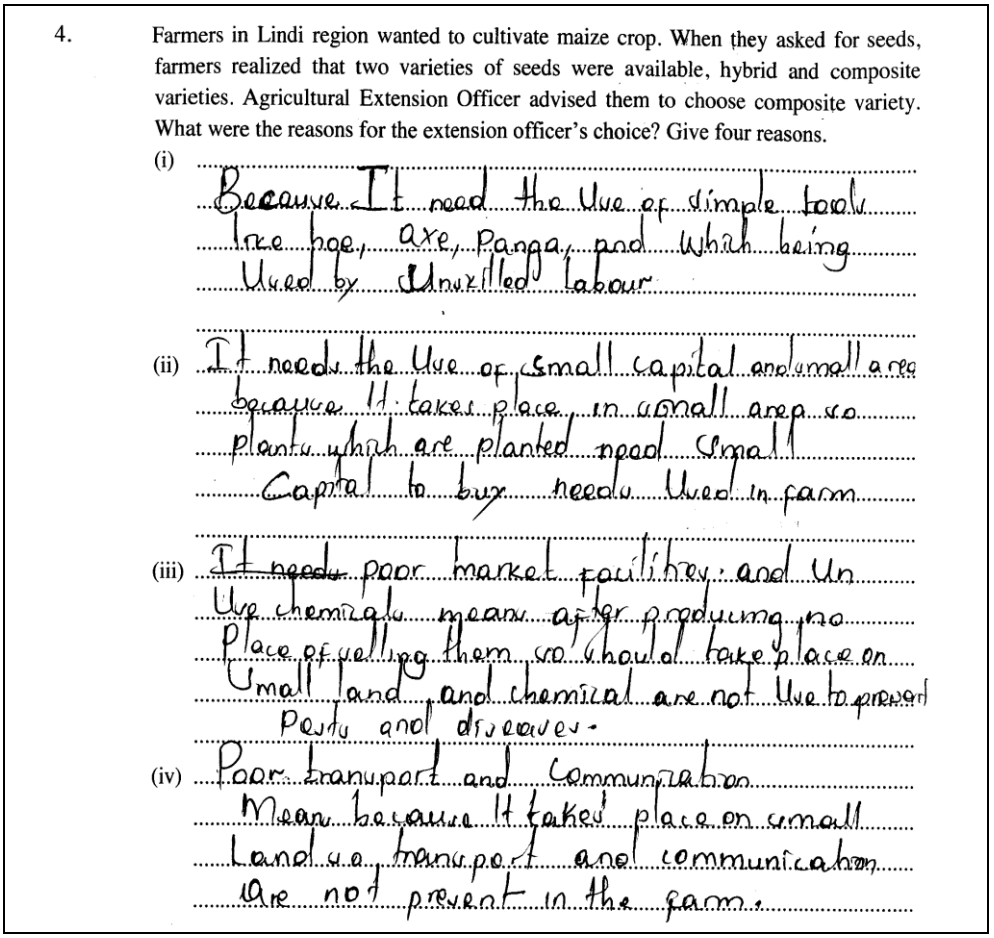


Figure 4: *Students' Performance on Question 4*

Figure 4 indicates that 93.3 per cent of the students scored from 0 to 2.5 marks, and 6.7 scored from 3 to 10 marks. Most of the students who had weak performance provided incorrect responses. The students failed to give reasons for the advice given by the extension officer to the farmers to use composite seeds instead of hybrid seed varieties. Examples of incorrect responses provided were *it controls soil erosion, officer is very good for teachers, it helps to support agricultural activities, composite variety is easy to cultivate and composite variety produce many new species*. The responses provided by the students were not related to the question asked. This showed that the students had inadequate knowledge of the characteristics of seed varieties. Extract 2.1 is an example of the incorrect responses to the question.


4. Farmers in Lindi region wanted to cultivate maize crop. When they asked for seeds, farmers realized that two varieties of seeds were available, hybrid and composite varieties. Agricultural Extension Officer advised them to choose composite variety. What were the reasons for the extension officer's choice? Give four reasons.

(i) Because It need the Use of simple tools like hoe, axe, panga, and which being Used by Unskilled labour

(ii) It needs the Use of small capital and small area because It takes place in small area so plants which are planted need small Capital to buy needs Used in farm

(iii) It needs poor market facilities and Un Use chemicals means after producing no Place of selling them so should take place on Small land and chemical are not Use to prevent Pests and diseases.

(iv) Poor transport and Communication Mean because It takes place on small Land so transport and communication are not present in the farm.

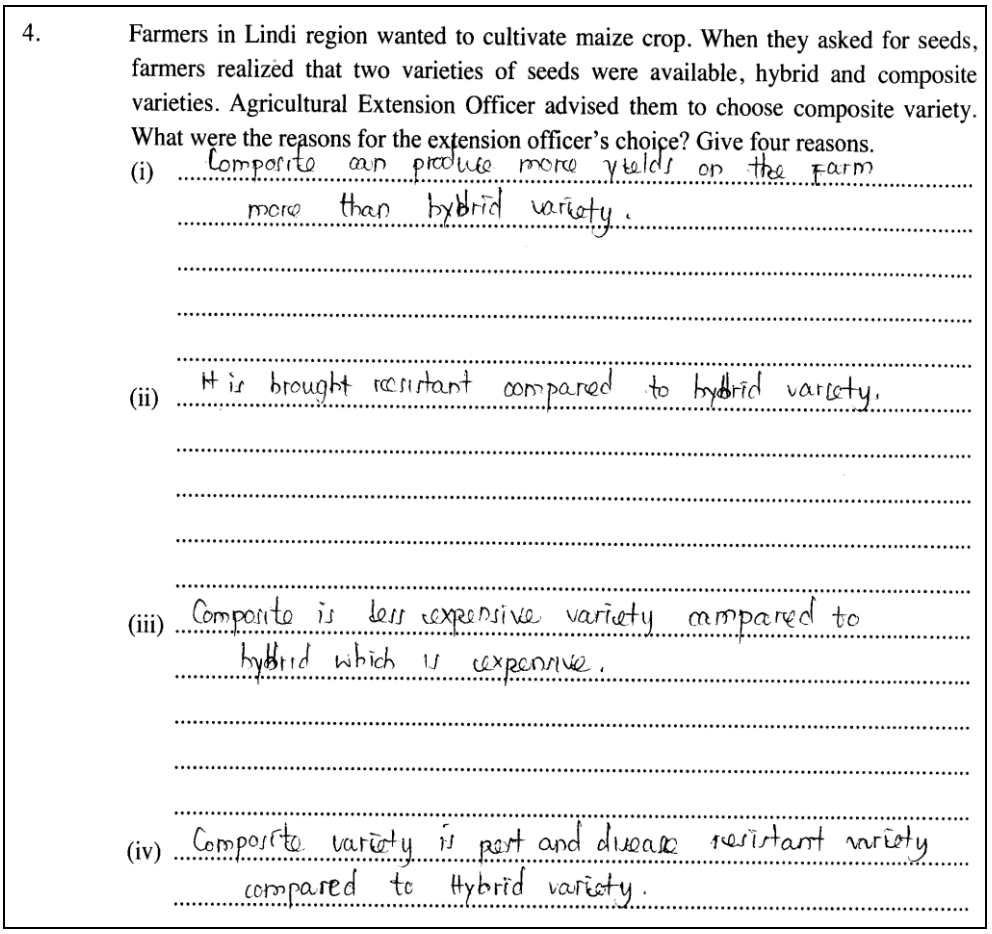
Extract 2.1: *A Sample of the Incorrect Responses to Question 4*

Extract 2.1 exemplifies incorrect responses to the question. The students wrote responses that were not related to the question asked.

The data shows that 5.7 per cent of the students had average performance on the question. The students did not exhaust all reasons for using composite seeds instead of hybrid seed varieties. The students had inadequate knowledge of the characteristics of seed varieties.

However, only 1 per cent of the students had good performance on the question. Most of them correctly attempted the question. They gave correct reasons for using composite seeds instead of hybrid seed varieties. Such responses were like *these varieties grow in lower altitude areas of which Lindi Region is among*; *if proper selection procedures are followed, farmers can use seeds selected from their harvest up to three cropping seasons after*

which fresh seeds must be obtained from seed companies; *they can also resist against pests and diseases infestation much better compared to other varieties*; *composites are more stable and highly adaptable to environment*; *composite seeds consist of several desirable characteristics features as compared to hybrid seeds, and composite is less costly than hybrid varieties*. This signifies that the students were knowledgeable about the characteristics of seed varieties, as Extract 2.2 shows.


4. Farmers in Lindi region wanted to cultivate maize crop. When they asked for seeds, farmers realized that two varieties of seeds were available, hybrid and composite varieties. Agricultural Extension Officer advised them to choose composite variety. What were the reasons for the extension officer's choice? Give four reasons.

(i) Composite can produce more yields on the farm more than hybrid variety.

(ii) It is brought resistant compared to hybrid variety.

(iii) Composite is less expensive variety compared to hybrid which is expensive.

(iv) Composite variety is pest and disease resistant variety compared to Hybrid variety.

Extract 2.2: *A Sample of the Correct Responses to Question 4*

Extract 2.2 exemplifies the correct responses to the question. The student provided all the correct responses required.

2.2.3 Question 5: Introduction to Agriculture

The question constituted parts (a) and (b), carrying 10 marks. The students were required to (a) justify the statement that "Agriculture is an important sector that influences human beings' day to day life" using the aspects of (i) Food (ii) Foreign exchange (iii) Industrial raw materials (iv) Employment and give one example in each case and (b) explain with one relevant example the relationship between agriculture and the following subjects: (i) Biology (ii) Chemistry and (iii) Physics. The question assessed the students' understanding of the role of agriculture in the country and its relationship with other subjects.

The question was attempted by 21,721 (100%) of the students. Among them, 12,368 (56.9%) scored from 0 to 2.5 marks; 5,366 (24.7%) scored from 3 to 6 marks; and 3,986 (18.4%) scored from 6.5 to 10 marks. The students' performance on this question was average. The distribution of their scores is shown in Figure 5.

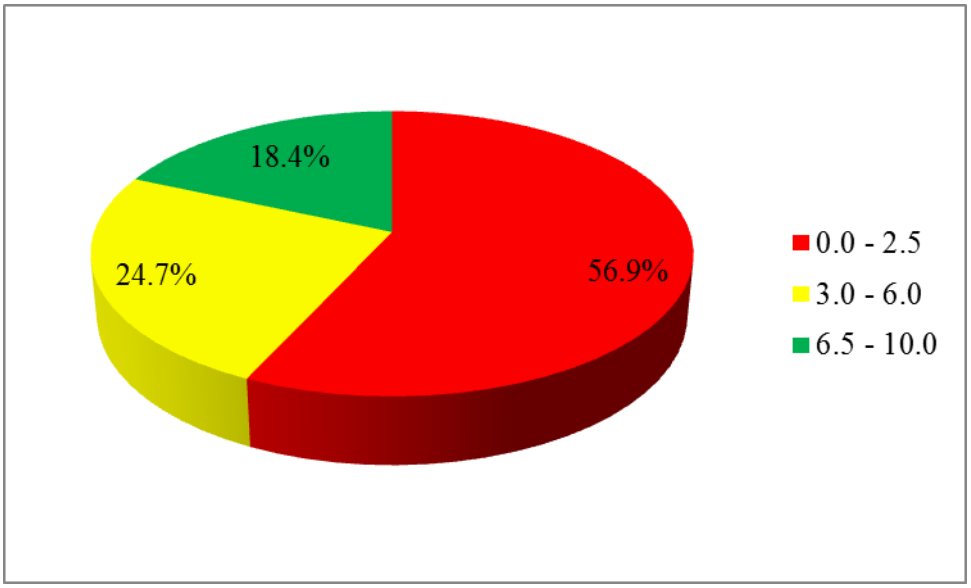


Figure 5: *Students' Performance on Question 5*

Figure 5 shows that 43.1 per cent of the students scored from 3 to 10 marks and 56.9 percent scored from 0 to 2.5 marks. Among the students who attempted the question, 18.4 percent had good performance. The analysis of responses from the students indicated that they responded correctly to nearly

all parts of the question. In part (a), they justified correctly the role of agriculture in the named aspect and provided relevant examples in each case. The students provided responses such as: (i) Food - *When people engage in agriculture for example crop production*; *they get food such as maize and food*. *In addition, when they keep livestock they get milk, eggs and meat*. *Agriculture therefore is a source of food supply to human beings*; (ii) Foreign exchange - *When agricultural products such as coffee, tea, cotton, sisal, cashew nuts, leather, meat, eggs and milk are sold overseas, we get foreign currency from those countries*. (iii) Industrial raw materials - *Agricultural products such as sugar cane, coffee, tobacco, tea, leather, milk and meat are raw materials for various industries of which without them they cannot operate*. *Therefore, agriculture is a source of raw materials for industries*; (iv) Employment - *Agriculture provides an indirect employment to many people who are engaged in crop and livestock farming as their economic activity*. *In addition, some people are employed directly as workers in mostly large-scale crop and livestock farms*. *These people work and get salaries for running their lives*.

Similarly, in part (b), the students explained well the relationship between agriculture and the named subjects. For example, (i) Biology - *Agriculture is the growing of crops and keeping livestock*. *On the other hand, biology is the study of life which is broadly divided into plants and animals*. *The knowledge of biology is important in agriculture because, it help farmers to practice animal breeding, control parasites, pests and diseases, and to monitor crop and livestock growth effectively*. (ii) Chemistry - *the processing of agricultural raw materials into food, fibres, and beverages needs chemistry knowledge*. *The science of chemical composition and changes involved in production, protection and use of crops and livestock is made in agriculture due to the knowledge of chemistry*. *The agro-chemicals like fertilizers, pesticides and herbicides used in agriculture, are made through the understanding of chemistry* (iii) Physics - *Making and using of different tools, equipment and machines in agriculture such as sprays, ox-implements, tractor implements, and other machines is possible due to the knowledge of physics*. This signified that the students were familiar with the role of agriculture in the country and its relationship with other subjects. Extract 3.1 shows an example of the correct responses to the question.

5. (a) Agriculture is an important sector that influences human beings' day-to-day life in different aspects. Justify this statement by using the following aspects. Provide one example for each case.

(i) Food

Agricultural sector is major source of food so it is important sector that influence daily life example of food that provided by agriculture is rice

(ii) Foreign exchange

Agriculture sector plays role in foreign exchange when agricultural product sold in international market. For example Tanzania get dollars when selling cashew nuts in international market.

(iii) Industrial raw material

Agricultural sector provides raw material that used in industries to ~~provide~~ manufacture useful product. Example of raw material provided by agriculture is cotton.

(iv) Employment

Agriculture plays important role in provision of employment for people. for example when labour are needed in the production process

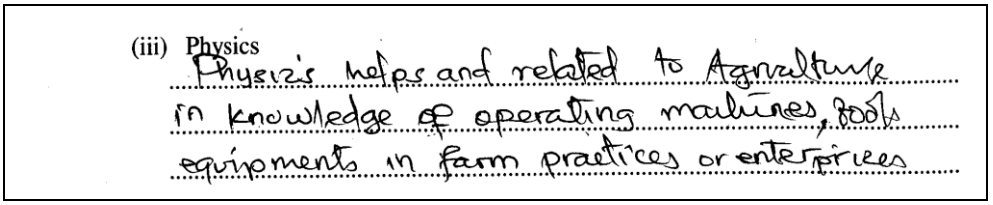
(b) Agriculture is an inter related discipline which cannot stand on its own. Explain its relationship with the following subjects by giving one relevant example for each.

(i) Biology

Biology helps Agriculture in the knowledge of crop and livestock breeds and species, pests and diseases and their control.

(ii) Chemistry

Chemistry related to Agriculture in knowledge of application of fertilizers, pesticides herbicides among others in farm enterprises.



Extract 3.1: *A Sample of the Correct Responses to Question 5*

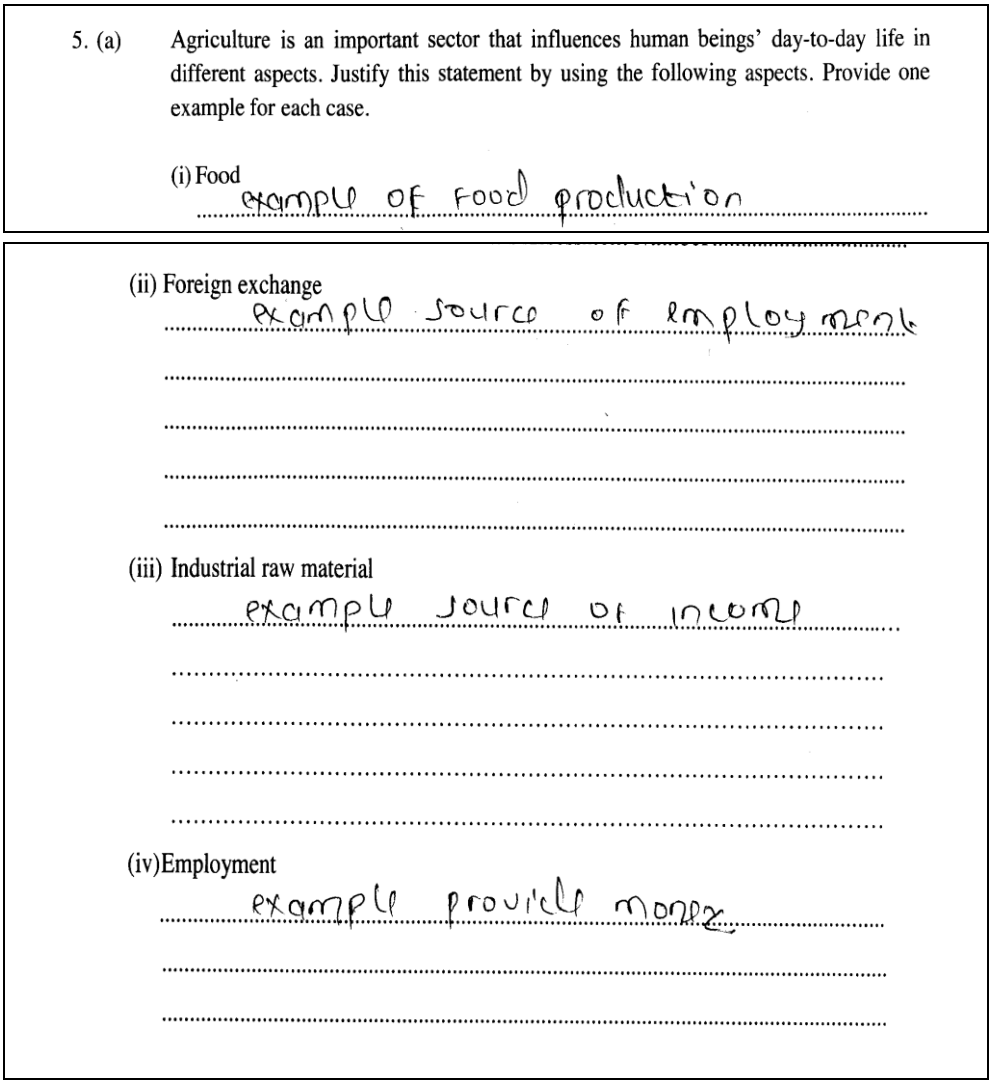
Extract 3.1 indicates the responses from a student who performed well in all parts of the question. The students possessed adequate knowledge of the subject matter.

The students who had average performance on the question were 24.7 per cent. Most of them justified the role of agriculture in the country and provided relevant examples in part (a). In part (b), they failed to explain the relationship between agriculture and the named subjects.

Conversely, analysis revealed that 56.9 per cent of the students had weak performance. Most of them provided incorrect responses to almost all parts of the question. In part (a), the students were unable to justify the given statement regarding the role of agriculture in the given aspects. They provided incorrect responses such as (i) Food - *used in money, is the food which people eat, source of income, source of health, it increase economic status of the family and it provide meat and milk* (ii) *Foreign exchange - source of capital, used in Kenya, support to get money, is the process of exchange money from country to another and for marketing* (iii) Industrial raw material - *tools for cultivation, support material for trading, is the material that are in industrial and livestock* (iv) Employment - *provide manure, is the process of getting money, manufacturing industrial, treatment of people and it help people to move from one place to another*.

Furthermore, in part (b), the students failed to explain the relationship between agriculture and the named subjects. Most of them responded incorrectly by trying to give the meaning of the subjects, instead of their relationship with agriculture. For example, (i) Biology - *is the study of non-living things, is the study of life and agriculture which contain shift cultivation and crop rotation, both it involves the study of human body, is the process of producing new generation*. (ii) Chemistry - *is the branch of science which involve composition and decomposition of organic matter, it*

deals with matter and occupies space, it involves titration of solution and science of discovering living and non- living things. (iii) Physics – *is the study of energy, it deal with cultivation of crops and keeping livestock, material of laboratory and scientist and it help to produce medicine in agriculture sector*. The responses provided were not related to the questions asked. Hence, the students lacked understanding of the role of agriculture in the country and its relationship with the other subjects. Extract 3.2 is an example of the incorrect responses to the Question.

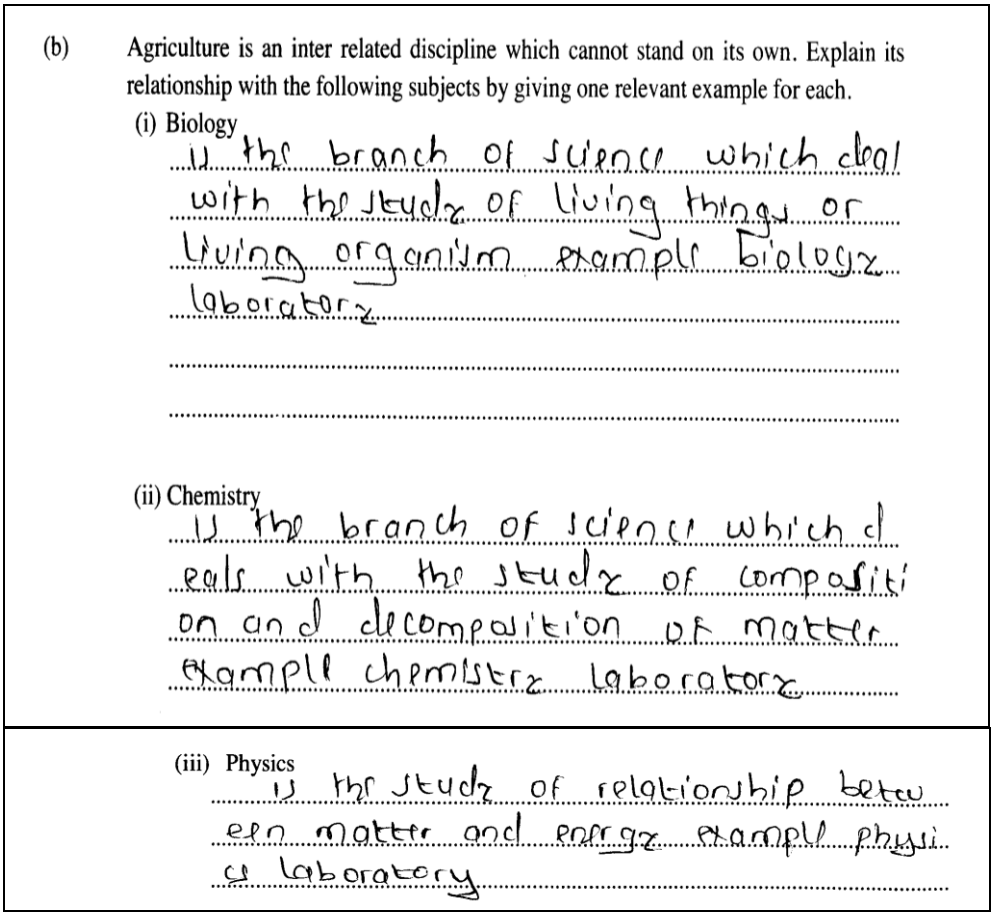

5. (a) Agriculture is an important sector that influences human beings' day-to-day life in different aspects. Justify this statement by using the following aspects. Provide one example for each case.

(i) Food
example of food production

(ii) Foreign exchange
example source of employment

(iii) Industrial raw material
example source of income

(iv) Employment
example provide money


(b) Agriculture is an inter related discipline which cannot stand on its own. Explain its relationship with the following subjects by giving one relevant example for each.

(i) Biology

it the branch of scienc which deal with the studx of living things or living organism exampl biologx laboratorx

(ii) Chemistry

it the branch of scienc which deals with the studx of compositi on and decompositi'on of matter exampl chemistrx laboratorx

(iii) Physics

it the studx of relationship betw een matter and enrgx exampl physi c laboratory

Extract 3.2: *A Sample of the Incorrect Responses to Question 5*

Extract 3.2 illustrates responses from a student who failed to answer any part of the question. The student lacked knowledge of the subject matter.

2.2.3 Question 6: Introduction to Livestock Production

The question had parts (a) and (b), carrying 10 marks. The students were required to (a) differentiate between continuous grazing and tethering as the two common grazing systems in Tanzania (b) give four advantages of zero grazing. The question tested the students' knowledge of the types of grazing systems in livestock farming.

The question was attempted by 21,721 (100%) of the students. Among them, 19,382 (89.2%) scored from 0 to 2.5 marks; 2,069 (9.6%) scored from 3 to 6 marks and 269 (2.8%) scored from 6.5 to 10 marks. The general

performance on this question was weak. Figure 6 shows the distribution of the students' scores in question 6.

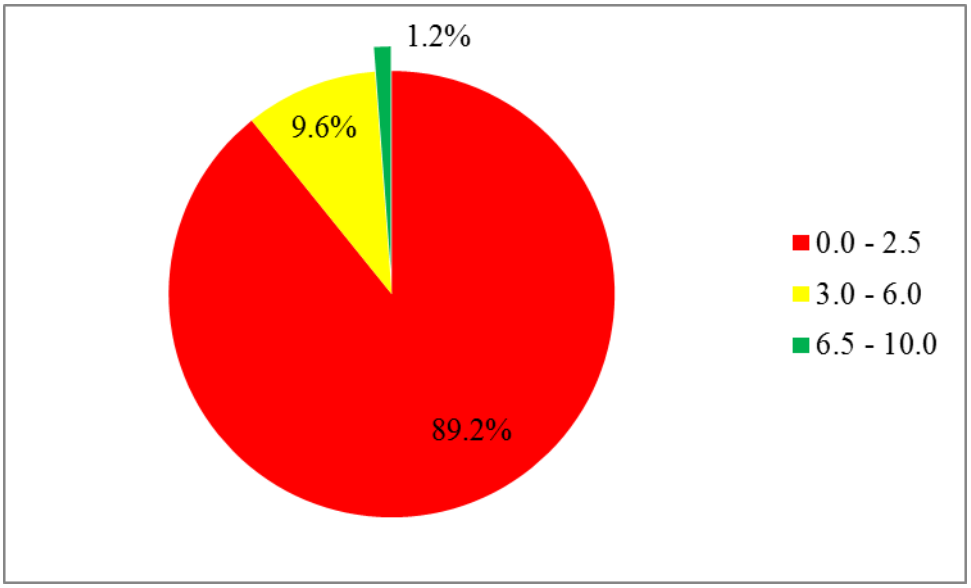
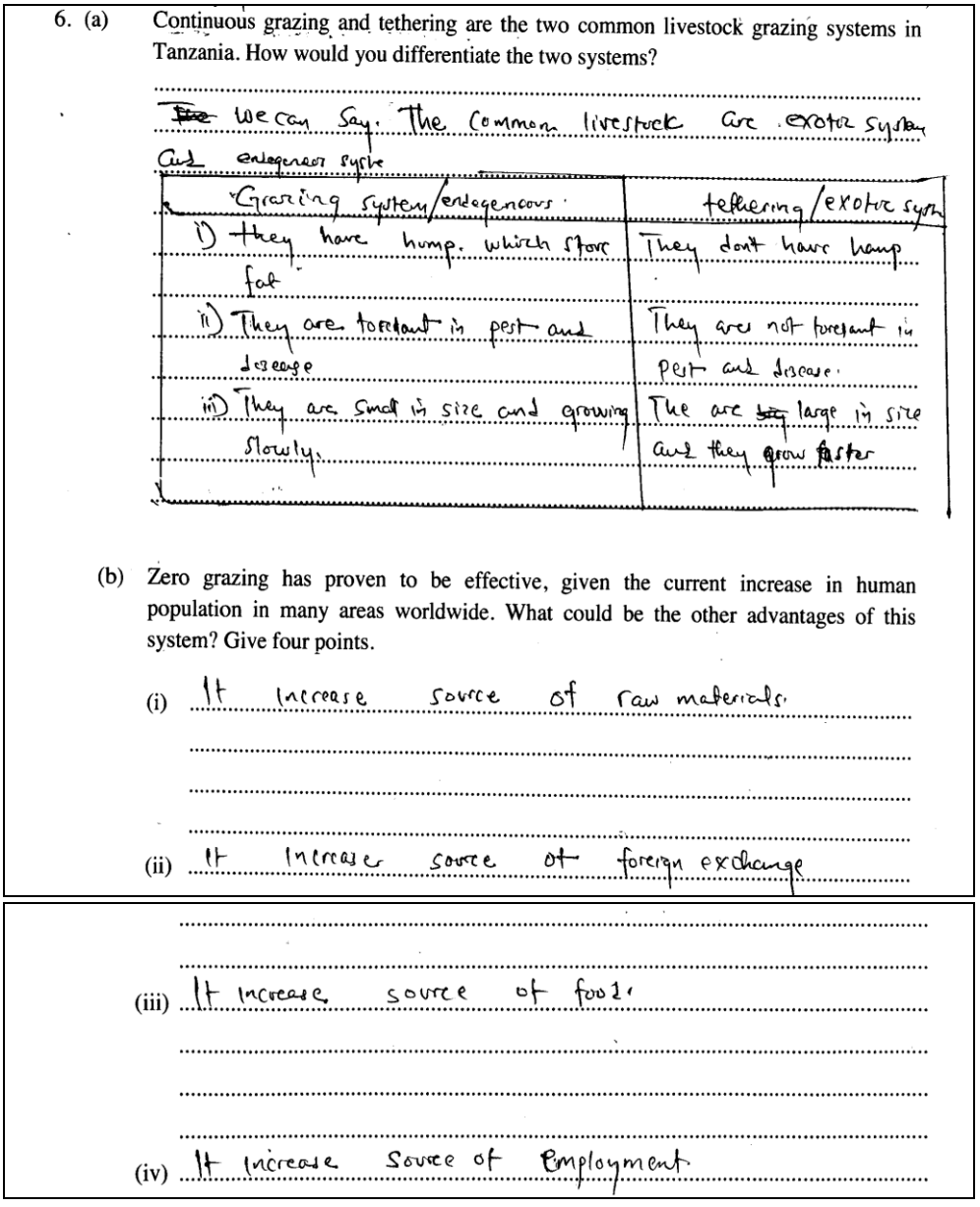


Figure 6: *Students' Performance on Question 6*

Figure 6 shows that the majority of the students (89.2%) had weak performance, by scoring from 0 to 2.5 marks and 10.8 per cent scored from 3 to 10 marks. Most of those with weak performance responded incorrectly to almost both parts of the question. In part (a), the students failed to differentiate continuous grazing from tethering. Examples of the incorrect responses were *continuous grazing is a system of grazing in which the livestock they feed throughout, while tethering is a system of grazing livestock in restricted time*; *continuous grazing system is a system of moving from one place in searching pasture, while tethering is a system of keeping the livestock in one area*; *continuous grazing are human being, while tethering are livestock grazing*; *continuous grazing is the system of keeping animal in scientist method, while tethering is a method of keeping livestock locally.*

Furthermore, in part (b), the students gave incorrect responses on the advantages of zero grazing such as *it causes soil erosion*; *it helps to conduct work*; *source of government revenue*; *source of raw material and increasing population*. In some cases, the students mentioned the importance of livestock production, instead of the advantages of zero grazing. The students

did not understand the meaning of the grazing systems asked in the question hence responding incorrectly. This is evidence that the students were not knowledgeable about the subject matter. Extract 4.1 illustrates incorrect responses to the question from one of the students.



6. (a) Continuous grazing and tethering are the two common livestock grazing systems in Tanzania. How would you differentiate the two systems?

We can Say. The common livestock are exotor syste and endegenous syste

Grazing system/endegenous	tethering/exotor syst
i) they have hump. which store fat	They dont have hump
ii) They are foreant in pest and disease	They are not foreant in pest and disease.
iii) They are small in size and growing slowly.	The are large in size and they grow faster

(b) Zero grazing has proven to be effective, given the current increase in human population in many areas worldwide. What could be the other advantages of this system? Give four points.

(i) It increase source of raw materials.

(ii) It increase source of foreign exchange

(iii) It increase source of food.

(iv) It increase source of employment

Extract 4.1: *A Sample of the Incorrect Responses to Question 6*

Extract 4.1 represents responses from a student who had poor mastery of the subject matter. He/she provided incorrect responses to all parts of the question.

Among the students, 9.6 per cent attained average performance on the question. Most of them did well in part (b). In part (a), however, they failed to explain the meaning of continuous grazing and so to differentiate it from tethering.

Nevertheless, a few students (1.2%) had good performance on the question. The analysis of their responses showed that they provided correct responses to nearly both parts of the question. In part (a), they correctly differentiated between continuous grazing and tethering. For example, continuous grazing *is conducted by taking the livestock to graze in the same pasture area every day almost throughout the year or throughout the season* while tethering *is conducted by tying the animal on the post by using a rope so that the animal utilizes the pastures within the circumference of the post*.

In part (b), the students correctly gave the advantages of zero grazing. Examples of the responses provided were (i) *there is no excessive trampling or overgrazing of pastures*, (ii) *forages can be allowed to grow at the desired levels and be harvested around the year to feed the animals especially when irrigation is done*, (iii) *the dungs collected from zero grazing units can be easily maintained for use in crop fields as a quality organic manures*, and (iv) *this system can be used for producing biogas as the animal dungs can be collected more effectively*. These responses prove that the students were competent in the subject matter. Extract 4.2 is illustrative.

6. (a) Continuous grazing and tethering are the two common livestock grazing systems in Tanzania. How would you differentiate the two systems?

Continuous grazing is the livestock grazing system where the livestocks are grazed on the same area throughout the year or season WHILE Tethering is the grazing system where the animal is being tied with the rope called tether on a tree and it feeds according to the length of the rope around the area.

(b) Zero grazing has proven to be effective, given the current increase in human population in many areas worldwide. What could be the other advantages of this system? Give four points.

(i) Help to avoid soil erosion on different places when the animals stay on a constant place

(ii) It is easy to eliminate the effect of parasite and disease

(iii) Help to avoid destruction of people property through avoiding the movement of animals in different places.

(iv) It is easy to collect the products from animals such as animal dung which can be used as manure in the farm.

Extract 4.2: *A Sample of the Correct Responses to Question 6*

Extract 4.2 indicates responses from a student who performed well in the question. He/she was knowledgeable about the subject matter.

2.2.4 Question 7: Principles of Crop Production

The question comprised parts (a) and (b), carrying 10 marks. The students were required to (a) give five purposes of proper tillage for improving crop production and (b) briefly explain the difference between primary tillage and secondary tillage. The question assessed the students' understanding of the concept of tillage.

The question was attempted by 21,720 (100%) of the students. Among them, 17,983 (82.8%) scored from 0 to 2.5 marks; 3,127 (14.4%) scored from 3 to 6 marks; and 610 (2.8%) scored from 6.5 to 10 marks. The general performance on this question was weak. Figure 7 shows the distribution of students' scores in the question.

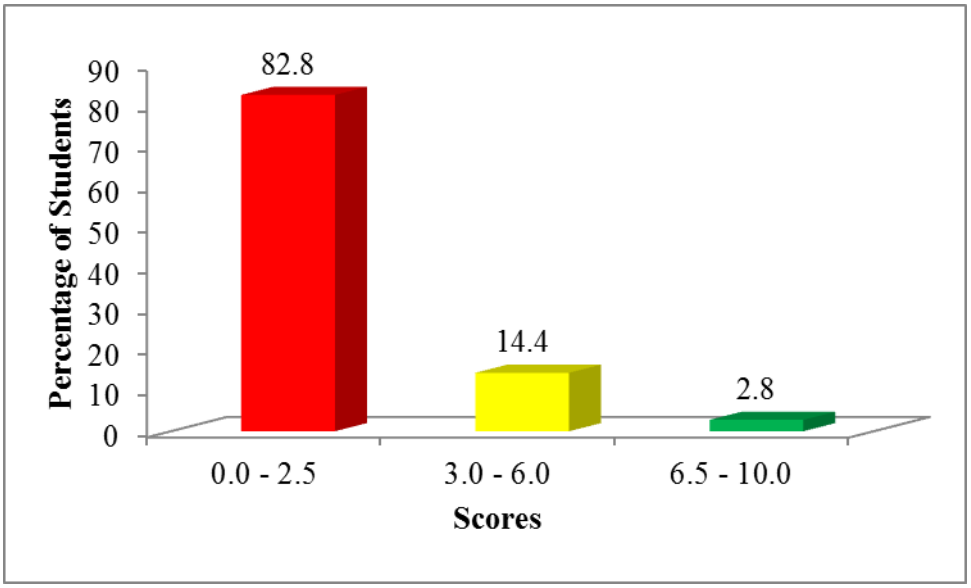
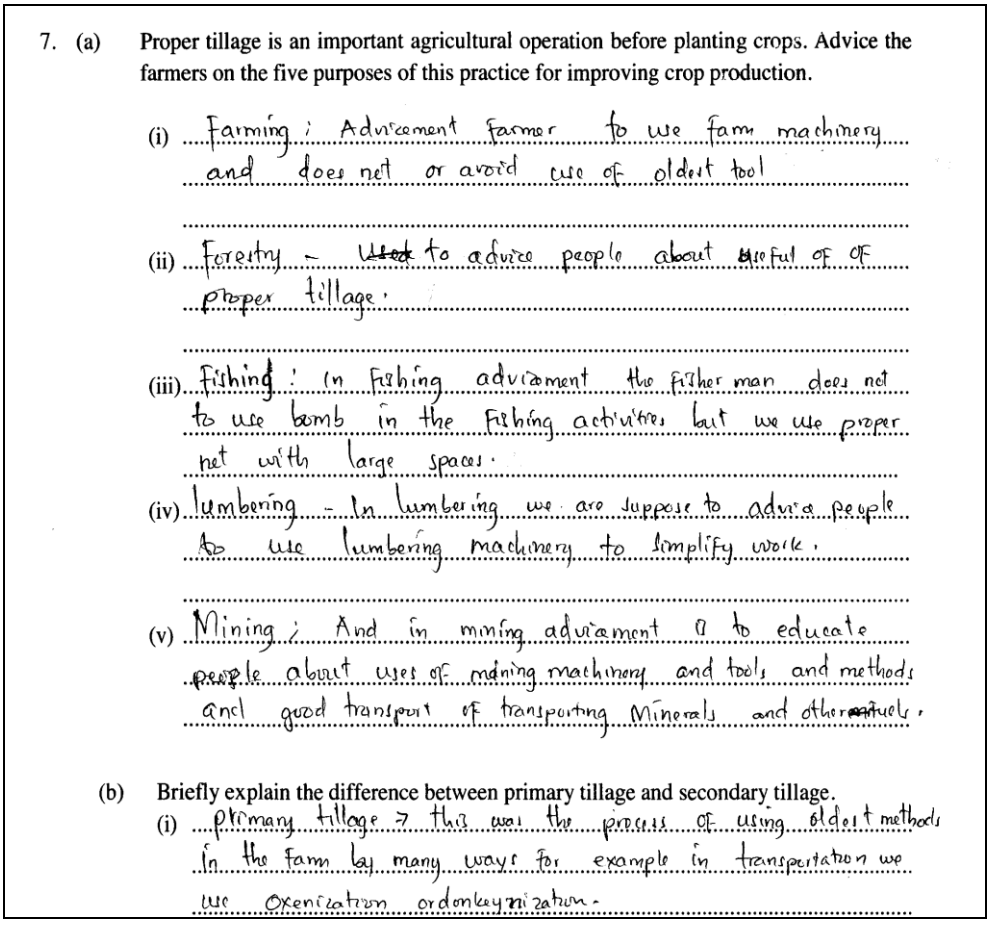


Figure 7: *Students' Performance on Question 7*

Figure 7 shows that 82.8 per cent of the students scored from 0 to 2.5 marks and 17.2 percent scored 3 to 10 marks. The analysis of responses from those who had weak performance indicated that most of them responded incorrectly to nearly both parts of the question. In part (a), they failed to give the purpose of tillage. Examples of the incorrect responses provided were *a farmer should be educated about control of pest and disease, to educate the farmers how to maintain fertility in the soil, it provides food for plant, it provides manure and to educate the farmer on how to prepare the land*.

Furthermore, in part (b), the students failed to explain the difference between primary and secondary tillage. Some of the incorrect responses provided were; *primary tillage is the tillage which use low technology in the farm while secondary tillage is the tillage which use high technology, primary tillage is the types of tillage which conducted during planting while secondary tillage are conducted after planting, primary tillage is better than secondary tillage, primary tillage are tillage which practiced in small area while secondary tillage was practiced in large area*. The responses provided suggest that the students did not understand the meaning of tillage because they lacked subject matter knowledge. Extract 5.1 is an example of the incorrect responses to the question.



7. (a) Proper tillage is an important agricultural operation before planting crops. Advice the farmers on the five purposes of this practice for improving crop production.

(i) Farming : Advicement farmer to use farm machinery and does not or avoid use of oldest tool

(ii) Forestry – ~~Used~~ to advice people about ~~use~~ ful of of proper tillage.

(iii) Fishing : In Fishing advicament the fither man does not to use bomb in the Fishing activities but we use proper net with large spaces.

(iv) lumbering – In lumbering we are suppose to advice people to use lumbering machinery to simplify work.

(v) Mining : And in mining advicament a to educate people about uses of mining machinery and tools and methods and good transport of transporting Minerals and other~~s~~fuels.

(b) Briefly explain the difference between primary tillage and secondary tillage.

(i) primary tillage = this was the process of using oldest methods in the farm by many ways for example in transportation we use Oxenization or donkeynization.

(ii) Secondary tillage → This was the process of used Modern technology and Machinery to perform different ~~ways~~ works, for example using of tractor and use of car in trasport ation of crops.

Extract 5.1: *A Sample of the Incorrect Responses to Question 7*

Extract 5.1 shows the responses from a student who lacked knowledge of the subject matter. He/she did not respond correctly to both parts of the question.

Data analysis indicated that 14.4 per cent of the students had average performance. Most of them attempted well part (a) of the question. In part (b), however, they did not fully explain the difference between primary and secondary tillage.

In contrast, 2.8 per cent of the students had good performance. Most of them provided correct responses to both parts of the question. In part (a), they gave correct purposes of tillage such as *producing suitable tilth for planting, to control soil moisture, temperature and aeration, to control weeds, incorporating fertilizers and manures in the soil and controlling pests and diseases causing organisms*. Similarly, in part (b), they correctly explained the differences between primary and secondary tillage. For instance, primary tillage operation *is the initial major soil working operation designed to loosen the soil, bury plant materials and rearrange soil aggregates*, while secondary tillage operation *is the operation intended to create more refined soil condition following primary tillage*. This indicated that the students were knowledgeable about the concept of tillage. Extract 5.2 illustrates a sample of the correct responses to the question.

7. (a) Proper tillage is an important agricultural operation before planting crops. Advice the farmers on the five purposes of this practice for improving crop production.

(i) To allow organic matter to incorparate with the soil

(ii) To facilitate roots penetration of crop plant in the field

(iii) To control weeds.

(iv) To facilitate water penetration in the soil

(v) To improve soil aeration.

(b) Briefly explain the difference between primary tillage and secondary tillage.

(i) Primary tillage → Is the first tillage after clearing or fallowing the land which involves tools like OX-plough, disc plough and mould board plough

While secondary tillag in Agricultural production process.

(ii) Secondary tillage - Are the lighter and finer operations done after primary tillage. It involves the tools like disc harrows and Zig Zag harrows in Agriculture.

Extract 5.2: *A Sample of the Correct Responses to Question 7*

Extract 5.2 is from a student who attempted the whole question correctly. He/she showed a good mastery of the subject matter.

2.2.5 Question 8: Principles of Crop Production

The question had parts (a) and (b), carrying 10 marks. The students were required to (a) explain how the following processes cause loss of soil fertility in agriculture fields: (i) soil erosion (ii) leaching (iii) volatilization (iv) fixation (v) uptake of soil nutrients by plants and (b) explain five ways in which the addition of organic materials improves soil fertility. The question assessed the students' knowledge of soil fertility.

This question was attempted by 21,720 (100%) whereby 20,182 (92.9%) scored from 0 to 2.5 marks, 1,417 (6.5%) scored from 3 to 6 marks and 122 (0.6%) scored from 6.5 to 10 marks. Their general performance on the question was weak. Figure 8 depicts the distribution of students' scores in the question.

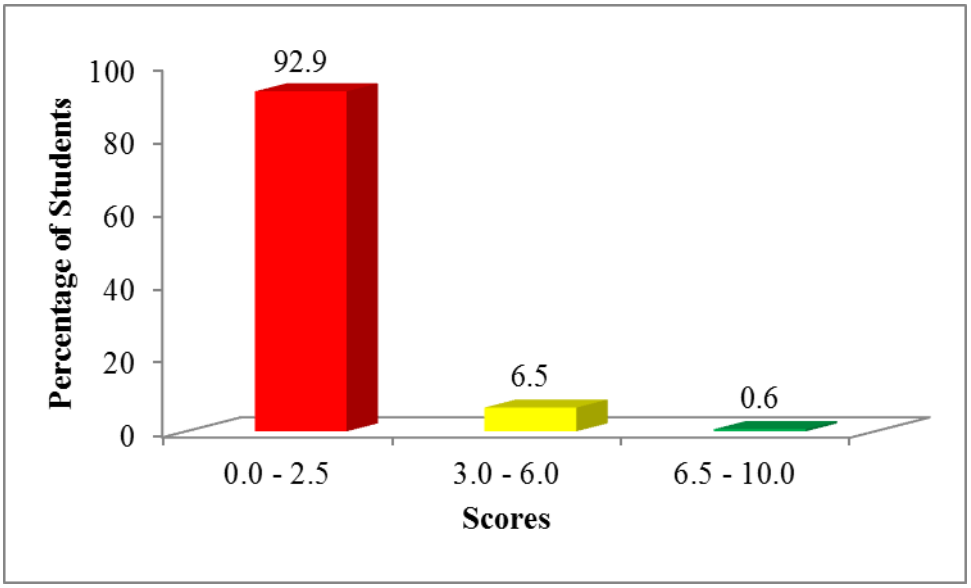


Figure 8: *Students' Performance on Question 8*

Figure 8 indicates that majority of the students (92.9%) had weak performance, scoring from 0 to 2.5 marks, and 7.1 percent scored from 3 to 10 marks. Their responses indicated that those who had weak performance responded incorrectly to almost the whole question. In part (a), they failed to explain how the named processes cause loss of soil fertility. Some of the incorrect responses provided were (i) soil erosion- *it cause flood, it lead to death of plant, it caused by environmental pollution and cutting of trees, is*

the properties of the soil and is the upper most layer of the earth; (ii) leaching- *it support human activities, it cause death of soil organism, it improve the soil texture, and it supply the nutrient to the root* (iii) volatilization-*it cause exchange of gases, it control parasite, it lead to soil erosion and collection of water over the soil surface*; (iv) fixation- *it cause air pollution, it increase production of crops, it control weed and it increase nutrient to the soil* and (v) uptake of soil nutrients by plants- *through irrigation, practicing of crop rotation, mulching and addition of organic matter*. Such incorrect responses show that the students failed to understand the meaning of the named processes.

Furthermore, in part (b), they failed to explain five ways in which the addition of organic materials to the soil improves soil fertility. Some of the incorrect responses provided were *include fallowing in crop rotation, to use chemical fertilizer, to practice crop rotation, compost manure, to control pest and disease and control weed*. In other cases, some students outlined the importance of organic matter to the soil and general methods of maintaining soil fertility, instead of explaining how the addition of organic materials improves soil fertility. This implied that the students had poor understanding of soil fertility. Extract 6.1 shows a sample of the incorrect responses to the question.

8. (a) A fertile soil is an important factor in enhancing high crop yields. However, soil fertility cannot remain constant over time as there are processes which cause loss of it. How do the following processes cause loss of soil fertility in agricultural fields?

(i) Soil erosion

This is due to the entry cropping of many crops in the farm and the farm does not left for farrowing. It can cause soil erosion.

(ii) Leaching

Through the bad arrangement of the land during the primary tillage the soil can left loss soil fertility.

(iii) Volatilisation

Through the method of calculation in each crops that are founded when there is bad propagation the soil can loss soil fertility.

(iv) Fixation

Through the method of preparing the farm poor after the growth of the crops the land can loss the soil fertility.

(v) Uptake of soil nutrients by plants

Because of the poor soil nutrients the plants cannot be able to grow well in such areas.

(b) One of the methods used to improve soil fertility is through addition of organic materials in the soil. Explain five ways in which this practice improves soil fertility.

(i) To let the land farrowing : It is the situation in which the farmer cultivate the crops and let the farm for some years in order to gain and improve soil fertility.

(ii) Mulching : Through mulching : This is the way that you cover the plant by using the unwanted grass in order to prevent soil fertility.

(iii) Through weeding : This is the process of removing unwanted materials in the farm so as the land to gain soil fertility.

(iv) Through Pruning : This is the method of land clearing which can help the soil to get nutrients through the soil fertility.

(v) Through minimum tillage : Through this the land is prepared well in the operation system in the minimum land so as the land to gain soil fertility.

Extract 6.1: *A Sample of the Incorrect Responses to Question 8*

Extract 6.1 justifies poor understanding of the concept of soil fertility. The students responded incorrectly to both parts of the question.

Data analysis showed that those with average performance were 6.5 per cent. Most of them correctly attempted part (a) of the question. In part (b), however, they explained the importance of organic matter in the soil, instead of how the practice of adding it improves soil fertility.

In contrast, a few students (0.6%) had good performance. They responded correctly to nearly both parts of the question. In part (a), they correctly explained how the named processes cause loss of soil fertility. For example, (i) Soil erosion - *the rich top soil is often removed away by runoff water and wind especially in sloping areas and those with poor vegetation cover,* (ii) Leaching - *this is a downward movement of nutrients to the lower horizons of soil. The soluble plant nutrients like Ca and K are therefore lost from the soil rooting zone,* (iii) Volatilization - *some plant nutrients like nitrogen can be lost from the soil through evaporation,* (iv) Fixation-*some minerals become fixed in the soil by various chemical reactions thus become*

unavailable to crop plant (v) Uptake by plants - *growing plants make constant uptake of nutrients in the soil which need regular replenishment.*

The students also explained how the addition of organic materials improves soil fertility in part (b). Examples of the responses provided were *it is a storehouse of plant nutrients such as nitrogen, decomposition products of organic matter bind soil particles together to farm granular structures which facilitate air and water movement and therefore improve soil structure, organic matter increases cation exchange capacity of the soil, provides nourishment for some useful soil microorganisms, organic matter buffer soils against rapid charges in soil pH* and *organic matter regulates soil temperature*. This proves that the students had adequate knowledge of the subject matter. Extract 6.2 indicates responses by a student who correctly addressed the question.

8. (a) A fertile soil is an important factor in enhancing high crop yields. However, soil fertility cannot remain constant over time as there are processes which cause loss of it. How do the following processes cause loss of soil fertility in agricultural fields?

(i) Soil erosion

By definiton this is removal of upper soil layer usually this layer is made of weathered matterials which are rich in nutrients hence removal of them cause the soil to loose fertility.

(ii) Leaching

This process cause loss of soil fertility especially in lateritic soil as the nutrients continue moving in lower soil level leaving the upper level unfertile

(iii)Volatilisation

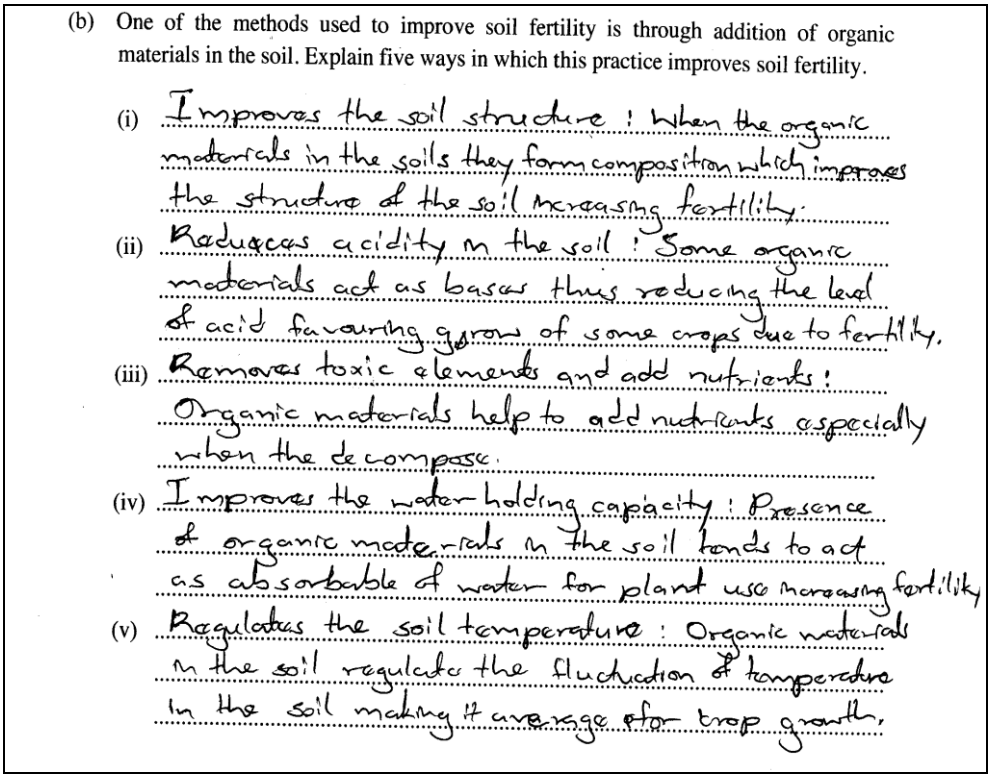
This process makes the soil loose fertility as hot and dry soil the nutrients like nitrogen vaporize in gaseous form leaving the soil lacking it.

(iv)Fixation

The presence of some nutrients like iron and aluminium hinders the availability of other elements like phosphorus, when they are fixed in soil

(v) Uptake of soil nutrients by plants

The continuous consumption of nutrients in the soil by plants leaves the soil with less or no nutrients making it unfertile.


(b) One of the methods used to improve soil fertility is through addition of organic materials in the soil. Explain five ways in which this practice improves soil fertility.

(i) Improves the soil structure : When the organic materials in the soils they form composition which improves the structure of the soil increasing fertility.

(ii) Reduceas acidity in the soil : Some organic materials act as basas thus reducing the level of acid favouring grow of some crops due to fertility.

(iii) Removes toxic elements and add nutrients : Organic materials help to add nutrients especially when the decompose.

(iv) Improves the water holding capacity : Presence of organic materials in the soil tends to act as absorbable of water for plant use increasing fertility

(v) Regulates the soil temperature : Organic materials in the soil regulate the fluctuation of temperature in the soil making it average for crop growth.

Extract 6.2: *A Sample of the Correct Responses to Question 8*

Extract 6.2 shows responses from a student who had a good mastery of the subject matter. He/she responded well to both parts of the question.

2.2.6 Question 9: Mechanisation in Agriculture

The question carried 10 marks. The students were required to describe how each of the following tools and equipment are used in making a wooden chair (i) cross cut saw (ii) tenon saw (iii) smoothing plane (iv) timber (v) claw hammer (vi) nails (vii) try square (viii) pencil (ix) ruler and (x) clamp. The question assessed the students' knowledge of the functions of farm workshop tools and equipment.

This question was attempted by 21,721 (100%) of the students. Among them, 13,290 (61.2%) scored from 0 to 2.5 marks; 5,480 (25.2%) scored from 3 to 6 marks; and 2,951(13.6%) scored from 6.5 to 10 marks. The general performance of the students on the question was average. Figure 9 illustrates the distribution of students' scores in the question.

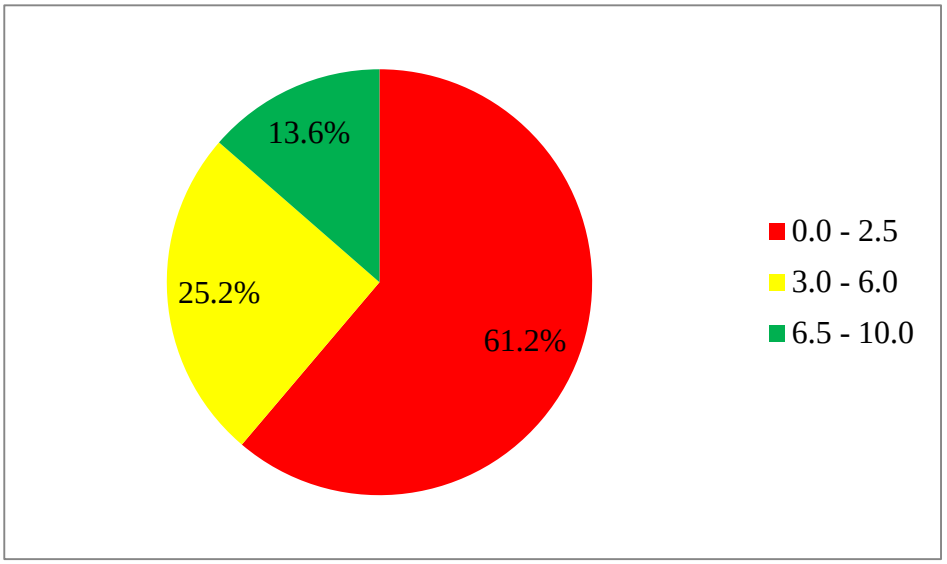


Figure 9: *Students' Performance on Question 9*

Figure 9 shows that 38.8 per cent of the students scored from 3 to 10 marks and 61.2 percent scored from 0 to 2.5 marks. Data analysis showed that 13.6 of the students had good performance on the question. Most of them correctly described the functions of the named tools and equipment. For example, (i) Cross cut saw - *will be used to cut wood into required pieces for making a chair* (ii) Tenon saw - *will be used for making joints required during joinery work* (iii) Smoothing plane - *will be used for shaving and smoothing wood* (iv) Timber - *wooden material to be smoothed to make a chair* (v) Claw hammer - *will be used drive the nails in the wood to make the chair* (vi) Nails - *materials to be driven with claw hammer to join piece in the wood* (vii) Try square - *this will be used to measure and test right angles* (viii) Pencil - *the pencil will be used for marking measurements* (ix) Ruler - *will be used to measure length and size of the wood* and (x) Clamp - *will be used to fit the joints and reinforce them*. This signifies that students were knowledgeable about the functions of farm workshop tools and equipment. Extract 7.1 illustrates a sample of the correct responses to the question.

9. Suppose you are provided with the tools and equipment in the school workshop: Cross cut saw; Tenon saw; smoothing plane; Timber; Claw hammer; Nails; Try square; Pencil; Ruler and Clamp. Describe how you would use each of the given tools and equipment in making a wooden chair.

(i) Cross cut saw

Used for cutting timber across the timber (grain).

(ii) Tenon saw

Used for cutting timber into different direction or used for making tenons.

(iii) Smoothing plane

Used for make the surface of a timber smooth

(iv) Timber

Used to make furniture (connected to make wooden chair).

(v) Claw hammer

Used for driving and removing nails into the wood.

(vi) Nails

Used for connect timbers during the process of making wooden chair.

(vii) Try square

Used for measure squareness among the angles of the connected parts of wooden chair.

(viii) Pencil

Used to draw / to mark area where to be cut by using a cross cut saw.

(ix) Ruler

Used to make a straight line when marking a place / part of wood (timber) to be cut by using a pencil.

(x) Clamp

Used for holding timbers together while you perform other part of that timber by example when you cut somewhere by using a cross cut saw the clamp hold wood (timbers) to be cut together.

Extract 7.1: *A Sample of the Correct Responses to Question 9*

Extract 7.1 exemplifies responses from a student who had adequate knowledge of the subject matter. He/she provided the correct functions of the tools and equipment.
The question had 25.2 percent of the students with average performance. Most of them failed to describe the functions of the smoothing plane, try square, clamp, tenon saw and timber. Hence, they did not score high marks.

In contrast, 61.2 per cent of the students had weak performance. Most of them failed to describe the functions of most of the named tools and equipment. Some of the incorrect responses provided were (i) Cross cut saw - *used for cutting tools, used for cutting metal and used for cutting flowers* (ii) Tenon saw - *used for making chairs, used for controlling saw, used for digging, used for smoothing metal and used for sterilizing the wooden chair* (iii) Smoothing plane - *used for harvesting, used to add materials to the workshop equipment, used for smoothing metal and used for cutting timber* (iv) Timber - *used to join timber, used as fire wood, used for making papers, and used for building* (v) Claw hammer - *used for straightening metal sheet, used for cutting tools and equipment, used for cultivation and used for making chair* (vi) Nails - *used for holding two metal, used for cutting timber, used for sharpening tools, and gluing metal* (vii) Try square - *used to measure angle of the wall, used to put shape to the chair, is the action of removing square in the diagram and used for levelling the chair* (viii) Pencil - *it is used for writing data, used for decorating the chair, used to pin nails and used for writing notes* (ix) Ruler - *used to fix chair legs, used to test timber and used to measure cross cut saw* (x) Clamp - *used to provide light, used to measure joints, used to cut big stone, and used to make holes on the chair*. This suggests that the students had inadequate knowledge of the functions of farm workshop tools and equipment. Extract 7.2 is an example of the incorrect responses to the question.

9. Suppose you are provided with the tools and equipment in the school workshop: Cross cut saw; Tenon saw; smoothing plane; Timber; Claw hammer; Nails; Try square; Pencil; Ruler and Clamp. Describe how you would use each of the given tools and equipment in making a wooden chair.

(i) Cross cut saw

Is the cross cut saw the tools and equipment the are cultuning tree and of the work in g are supported of simple machine of work.

(ii) Tenon saw

Tenon saw the y are supported of agricultural mechanical of work to wed the cuting of tool and wood of the working of the equipment.

(iii) Smoothing plane

It used to the planting of the farmers of the equipment of the agricultural.

(iv) Timber

It wed to tool of the agricultural of the livestock

(v) Claw hammer

It wed to the measured of the hammer of the farmers of the equipments.

(vi) Nails

Is the nails of the tool of the equipment of agricultural of the measured of the farmers

(vii) Try square

Is the measured of the Stucured of the calculated of the volume the tool of agricultural equipment.

(viii) Pencil

Pencil - the tool and equipment of Support to used to record of the data and farm and to wed to working and they are agricultural mechanical.

(ix) Ruler

Ruler - Is the main tool and the supported of the measured of the volume of the working to height to the farmers and to mead of width and height.

(x) Clamp

Is the wed of the tool of the livestock of the agricultural equipment.

Extract 7.2: *A Sample of the Incorrect Responses to Question 9*

Extract 7.2 portrays responses from one of the students who failed to describe the functions of the named tools and equipment.

2.3 SECTION C: ESSAY QUESTION

2.3.1 Question 10: Principles of Crop Production

This essay question carried 15 marks. It required the students to argue for and against the notion that weeds are useful in the farm by giving three points for each case. The question assessed the students' understanding of beneficial and harmful effects of weeds.

The question was attempted by 21,716 (100%) of the students. Among them, 12,861 (59.2%) scored from 0 to 4 marks; 4,387 (20.2%) scored from 4.5 to 9.5 marks; and 4,468 (20.6%) scored from 10 to 15 marks. Their overall performance on the question was average. Figure 10 indicates the distribution of students' scores in the question.

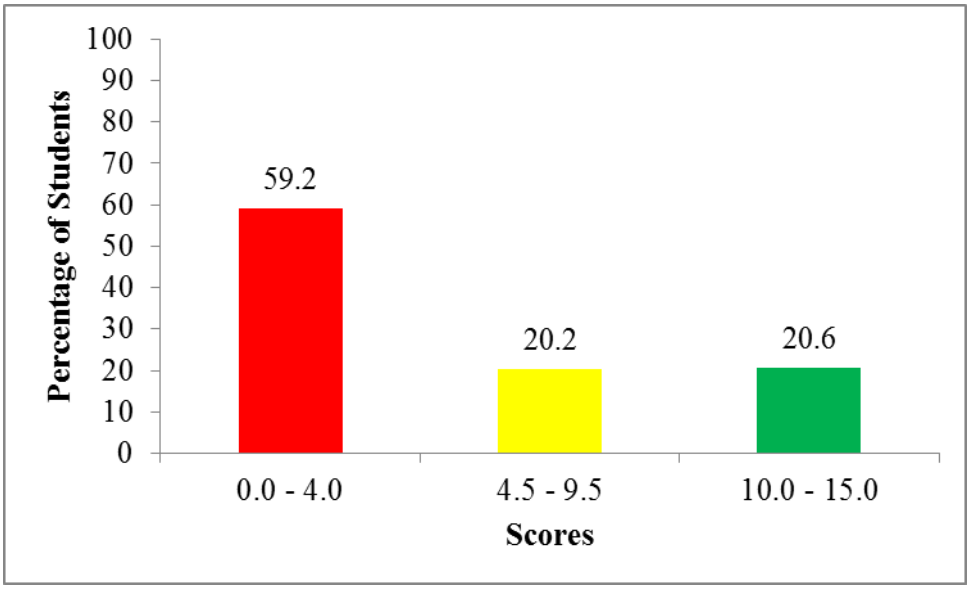


Figure 10: *Students' Performance on Question 10*

As shown in Figure 10, 40.8 per cent of the students scored from 4.5 to 15 marks, and 59.2 per cent scored from 0 to 4 marks. Data analysis indicates that 20.6 per cent of the students had good performance on the question.

Most of them correctly argued for and against the notion that weeds are useful. For example, the usefulness of weeds includes *reduce soil erosion*, *add organic matter*, *act as food*, *medicinal value*, *provide shelter*, *decoration*, *mulching materials* and *contribution to biodiversity*. The harmful effects of weeds on the farm include *some weeds are poisonous*, *compete with crop plants*, *increase the costs of production*, *harbour pests and disease causing-organisms*, *blockage of water channels*, *lower the quality of crop harvest*, *weeds are parasitic to crop plants and some weeds are allelopathic*. This indicates that students had adequate knowledge of the concept of weeds. The students also demonstrated good essay writing skills by organising it into the introduction, main body and conclusion. Extract 8.1 shows one of the students' correct responses to the question.

10. A group of Form Two students were found debating on whether weeds are useful or harmful in a farm. Based on your knowledge in crop protection, argue for and against this motion by giving three points on each side of the motion.

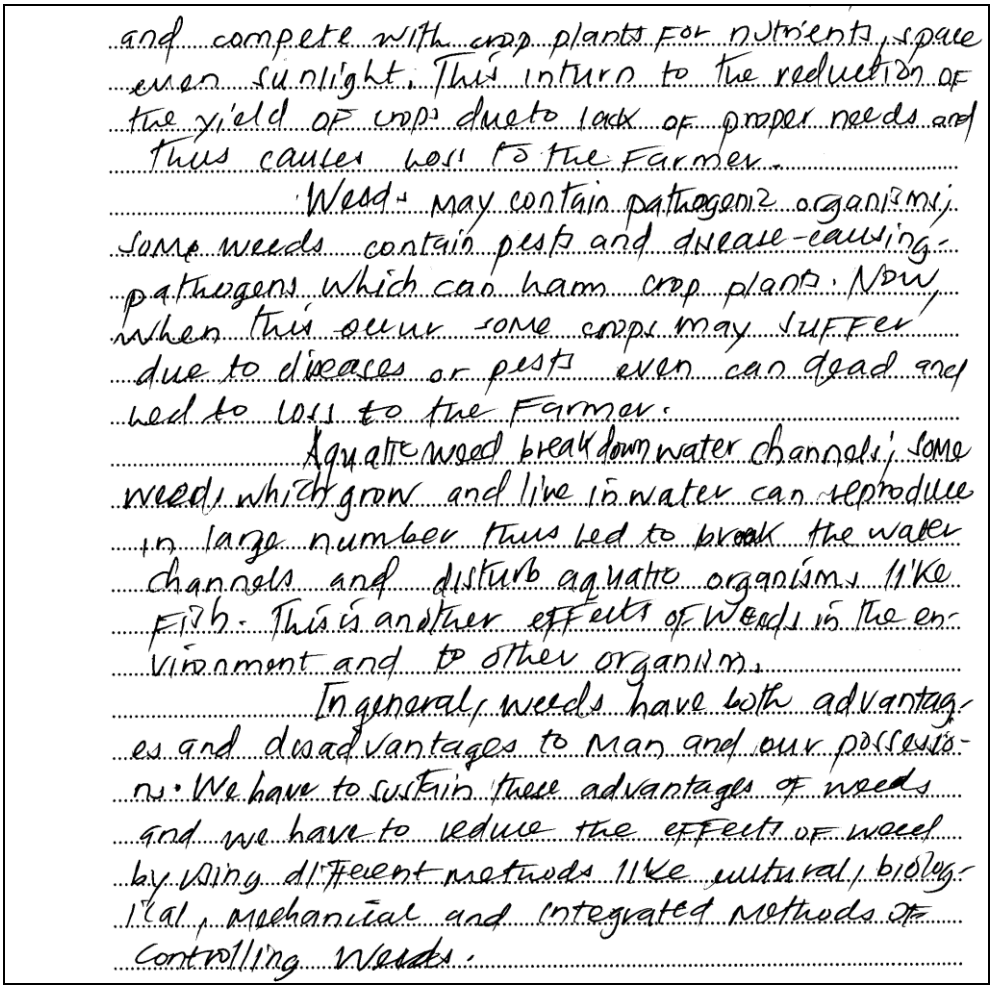
Weed is a plant which grow in area (Field) where it is not wanted. In general, Weeds have some importances and effects to crops and environment. Weed can have both benefits and harmful effects to both human and his possessions. Some of the importances of Weeds are as Follows;

Weeds prevent soil erosion. When weeds grow in area relative to other plants, they assist to prevent soil erosion by holding soil particles together through their roots. This is one of the basic important and benefit of weed to the environment.

Weeds have Medicinal value; some weeds are used to make medicines and have great value of medicine. These Medicines are used either by human or their livestock to sustain livelihood. So Weeds benefit human beings in different ways.

Weeds are source of Food; some weeds are used as food mainly by livestock but even human beings can use weeds as sources of Food. Provision of Food to both livestock and human bring great benefit to man and to the environment. On other side, weed have some effects to the environment as well as human and their possessions. Some of the effects of weed are;

Weeds compete with crop plants for nutrients. Mainly weed grow in areas where they are not wanted


and compete with crop plants for nutrients, space even sunlight. This inturn to the reduction of the yield of crops due to lack of proper needs and Thus causes loss to the Farmer.

Weeds may contain pathogenic organisms. Some weeds contain pests and disease-causing pathogens which can harm crop plants. Now, when this occur some crops may suffer due to diseases or pests even can dead and led to loss to the Farmer.

Aquatic weed breakdown water channels, some weeds which grow and live in water can reproduce in large number thus led to break the water channels and disturb aquatic organisms like fish. This is another effects of Weeds in the environment and to other organism.

In general, weeds have both advantages and disadvantages to man and our possessions. We have to sustain these advantages of weeds and we have to reduce the effects of weed by using different methods like cultural, biological, mechanical and integrated methods of controlling weeds.

Extract 8.1: *A Sample of the Correct Responses to Question 10*

Extract 8.1 shows the responses by a student who correctly attempted the question. He/she provided correct beneficial and harmful effects of weeds on the farm.

Furthermore, 20.2 per cent of the students had average performance. Most of them failed to give detailed explanations of the beneficial and harmful effects of weeds on the farm.

However, 59.2 per cent of the students had weak performance. Most of them failed to explain the beneficial and harmful effects of weeds on the farm. They provided incorrect responses such as *it is used for making tea*, *it reduces high cost*, *it provides raw material for industrial*. Examples of the incorrect responses on the harmful effects of weeds were *crop rotation*, *minimum tillage*, *liming*, *land preparation*, *pest and disease control* and

overgrazing. In some cases, students stated methods of controlling weeds like *cultural method, chemical method, biological method, mechanical method and integrated method* instead of the beneficial and harmful effects of weeds on the farm. The incorrect responses provided by the students indicate their poor understanding of the subject matter. Furthermore, they exhibited poor essay writing skills. Extract 8.2 is a sample of the incorrect responses to the question.

10. A group of Form Two students were found debating on whether weeds are useful or harmful in a farm. Based on your knowledge in crop protection, argue for and against this motion by giving three points on each side of the motion.

Physical weed Control : is the process of plant advantege the Following each the plant production in which mechanical advantege the weed crop cant.

Biological weed control : is the process of weed mechanical the used weed the process of animal plant crop in the reduces Bacter virus fung in the crop pest n the production that introduce roalmo teno in the plant field animals of weed in the method caltivation plant weed co ntor in the production and animal production the composition the resource of income the advanges the crop production in the recouse crops animal.

Chemical weed control is the production of ramaterial that in crop production the composition in plant and pest and desease the animal produ ction of the culture that operson in the production to produce in the some weed control in the crop planted. that grof field. animal

Cunually weed is the anwanted different crop plant and crop planted field : this that is the production of ramateri al in the process of the material.

Extract 8.2: *A Sample of the Incorrect Responses to Question 10*

Extract 8.2 indicates the responses by a student who incorrectly addressed the question. He/she provided incorrect beneficial and harmful effects of weeds on the farm.

3.0 ANALYSIS OF STUDENTS' PERFORMANCE ON EACH TOPIC

The assessment covered 100 per cent of the topics as per assessment format. The analysis of the students' performance shows that they attained good performance on Multiple-Choice Items (73.1%). The items were set from the topics of *Introduction to Agriculture*, *Principles of Crop Production*, *Introduction to Livestock Production*, *Introduction to Soil Science*, *Factors of Production*, *Basics of Farm Management* and *Crop husbandry*.

The students attained average performance on the topics of *Introduction to Crop Production* (63.5%), from matching items, *Introduction to Agriculture* (43.1%) and *Mechanisation in Agriculture* (38.8%). Conversely, the students attained weak performance on the topics of *Principles of Crop Production* (17.95%), *Introduction to Soil Science* (17.4%) and *Introduction to Livestock Production* (10.8%). The analysis of students' performance on different topics in the 2021 FTNA is summarised in Appendix

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

The results of this year's FTNA in the Agriculture subject demonstrate weak performance. Data indicates that 73.32 per cent of the students who sat for the assessment failed. This is an increase of 4.8 per cent of the students who failed compared to the year 2020.

The students' performance is determined by their responses. This part highlights the reasons that contributed to the students' good or weak performance. The analysis of responses from the students who had weak performance attributes such performance to several reasons. These include;

(a) inadequate knowledge of the topics included in the assessment. This situation caused the students to provide incorrect responses and write points which did not address the questions asked;

(b) misconceptions in the questions that led the students fail to meet demands of the questions;

(c) failure to respond correctly in line with the requirements of the questions, which resulted into loss of marks;

(d) poor essay writing skills which made most of the students fail to organize their essays into the introduction, main body and conclusion parts.

In contrast, the responses by the students who attained good performance showed that they had good mastery of the subject matters assessed. This situation enabled them to meet demands of the questions. They also demonstrated good essay writing skills and understanding of the action verbs used in the questions.

4.2 Recommendations

The following are recommended to enhance the teaching and learning process and consequently improve students' performance in future assessments:

(a) Teachers should put more emphasis on the practical aspect of the subject. For example, infiltration rates of different soil samples from the topic of *Introduction to Soil Science* and functions of farm workshop tools from the topic of *Mechanisation in Agriculture* could be taught more effectively in practical sessions. This is because students learn better by seeing and doing.

(b) Teachers should teach students how to identify the requirements of the question by considering the action verbs used in a particular question. For example, explain, describe and argue for and against demand different skills levels as proposed in Bloom's taxonomy.

(c) Teachers should teach the students on how to organise essay questions into the introduction, main body and conclusion parts.

(d) Teachers should use various teaching and learning strategies to achieve their goals. For example, teaching about the grazing systems from the

topic of *Introduction to Livestock Production* and the importance of tillage operations from the topic of *Principles of Crop Production*. Teachers could stimulate creative thinking of their students and allow sharing ideas using brainstorming and group discussion methods, respectively.

Appendix I

Students' Performance per Topic in FTNA 2021

S/N	Topic	Question Number	Percentage of the Students who scored the average of 30% or above	Comments
1.	Introduction to Agriculture, Principles of Crop Production, Introduction to Livestock Production, Introduction to Soil Science, Factors of Production, Basics of Farm Management and Crop Husbandry	1	73.10	Good
2.	Introduction to Crop Production	2	63.50	Average
3.	Introduction to Agriculture	5	43.10	Average
4.	Mechanisation in Agriculture	9	38.80	Average
5.	Principles of Crop Production	4,7,8 ,10	17.95	Weak
6.	Introduction to Soil Science	3	17.40	Weak
7.	Introduction to Livestock Production	6	10.80	Weak