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

STUDENTS' ITEMS RESPONSE ANALYSIS REPORT ON THE FORM TWO NATIONAL ASSESSMENT (FTNA) 2022

AGRICULTURE

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034 AGRICULTURE

Published by:
The National Examinations Council of Tanzania,
P.O. BOX 2624,
Dar es Salaam, Tanzania.

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FOREWORD

This report presents Students' Items Response Analysis (SIRA) on Form Two Agriculture National Assessment which was conducted in November 2022. The report aims to provide feedback to all educational stakeholders on the factors that contributed to the students' performance in Agriculture.

The Form Two National Assessment (FTNA) is a formative evaluation which intends to monitor students' learning to provide feedback that teachers, students and other educational stakeholders can use to improve teaching and learning respectively. This analysis shows justification for the students' performance in the Agriculture subject. The students who attained high scores had adequate knowledge of the subject matter, good command of English language and responded appropriately as per action verbs used.

However, students who scored low marks faced difficulties in responding to the questions due to their insufficient knowledge of the tested concepts.

This report will help students to identify strengths and weaknesses for them to improve learning before sitting for their Certificate of Secondary Education Examination (CSEE). It will help teachers to identify the challenging areas and take appropriate measures during teaching and learning.

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

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

Dr. Said Ally Mohamed
EXECUTIVE SECRETARY

1.0 INTRODUCTION

This report presents the analysis of students' performance in FTNA 2022 in Agriculture subject. The assessment was set in accordance with the 2021 assessment format which is based on the 2019 Agriculture Syllabus.

The assessment had one theory paper of 2:30 hours duration with ten questions in total organized in sections A, B, and C. As per instructions, students were required to answer all questions. With respect to the nature of the questions, section A had two objective questions. Question one was composed of 10 Multiple Choice items and question two had five Matching Items. In terms of weight, question one carried 10 marks whereas question two (2) carried five (5) marks. In total, section A carried 15 marks. Section B comprised seven short answer questions each carrying 10 marks making a total of 70 marks. Section C had one essay type question carrying a total of 15 marks. The paper weighed 100 marks.

The statistics indicated 23,886 students to have sat for 2022 FTNA in Agriculture subject of which 9,280 (38.88%) passed and 14,590 (61.12%) failed. This generally shows average performance of the students. The performance in this year has increased by 12.20 percent pass compared to the 2021 results. The performance of the students by grades in 2022 FTNA in Agriculture subject is shown in Table 1.

Table 1: Students' Performance by Grades in FTNA 2022

Grades	A	B	C	D	F	Withheld	Total
Male	176	299	1,801	2.874	5,603	3	10,753
Female	48	179	1,148	2,755	8,987	13	13,133
Total	**224**	**478**	**2,949**	**5,629**	**14,590**	**16**	**23,886**

Source: NECTA Statistics Book, **pg 6**, FTNA (2022)

The students' results in this assessment were categorized into five grades namely A, B, C, D and F. Each grade had a respective score interval and remarks as follows: Grade A had a score interval of 75-100 (Excellent); Grade B had a score interval of 65—74 (Very good); Grade C had a score interval of 45—64 (Good); Grade D had a score interval of 30—44 (Satisfactory) and Grade F had a score interval of 0—29 (Fail).

The following sections present the analysis of the students' performance in each question and topic. The report also includes conclusion and recommendations that provide an overview of the analysis and suggestions to improve students' performance in future assessment respectively.

2.0 THE ANALYSIS OF THE STUDENTS' PERFORMANCE ON EACH QUESTION

This section presents the analysis of the students' performance on each questions whereby the topics assessed are also presented. For the purpose of clarity, the analysis describes the demands of each question, the overall students' performance for each question, their responses and possible contributing factors for their performance. Samples of students' responses from scripts and graphs are presented for demonstration. In addition, for simple interpretation of the results, this analysis has grouped the performance into three categories namely good (65-100), average (30-64) and weak (0-29). Three colours (green, yellow and red) have been used to indicate good, average and weak performance respectively.

2.1 SECTION A: OBJECTIVE QUESTIONS

2.1.1 Question 1: Multiple - Choice Items

The question consisted of ten multiple - choice items derived from the topics of *Introduction to Agriculture*, *Principles of Crop Production*, *Introduction to Livestock Production*, *Introduction to Soil Science*, *Basics of Farm Management*, *Factors of Production*, *Introduction to Crop Production* and *Crop husbandry* in the Agriculture Syllabus. Each item carried one (1) mark making a total of 10 marks. The students were required to choose a correct answer from the four given alternatives and write its letter in the box provided.

The question was attempted by 23,886 (100%) students whereby 3,784 (15.8%) scored from 0.0 to 2.0 marks; 18,028 (75.3%) from 3.0 to 6.0 marks and 2,074 (8.7%) from 7.0 to 10 marks. Figure 1 shows the distribution of students' scores on the question.

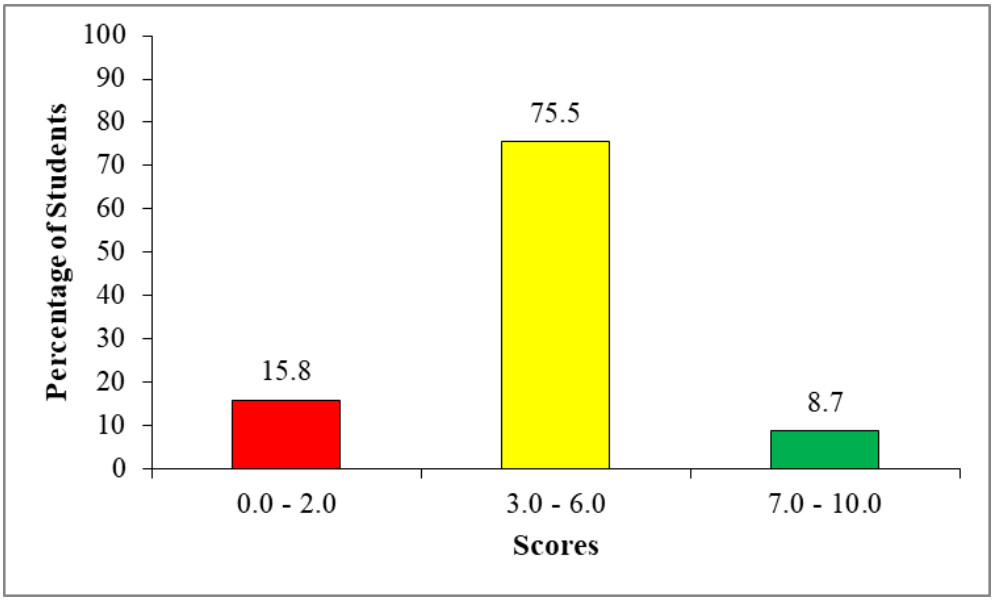


Figure 1: *Distribution of the students' scores on Question 1*

As expressed in Figure 1, 84.2 per cent of the students scored from 3.0 to 10 marks and 15.8 per cent from 0.0 to 2.0 marks. The data show that the students' performance in the question was good.

Generally, the majority of the students responded correctly to items (i), (ii), (iii), (v), (vii), (viii) and (ix) and incorrectly to items (iv), (vi) and (x). Analysis of students' responses in each item is as follows:

In item (i), the students were required to choose an option that indicate the role of sweet potatoes in crop rotation. The question tested the students' understanding of the role of cover crops in the crop rotation system. The correct response was C (They suppress weeds). The distractors were A (They increase moisture in the soil), B (They help to control pest and diseases) and D (They improve soil aeration).

Majority of the students chose the correct option in this question indicating their being knowledgeable about the role of cover crops in the crop rotation system. One of the principles of crop rotation is to grow crops of different growing habits. Therefore, sweet potatoes that have a spreading growing habit, cover the soil more fully hence suppressing weeds. With regard to option A, moisture retention in the soil can be achieved through covering the

soil with mulches, less tillage operations and addition of organic matter. Control of pests and diseases in option B is the function of the whole practice of crop rotation where the life cycles of pests and pathogens are interfered and broken down by growing different crops. Improvement of soil aeration in option D is done through tilling the soil and addition of organic matter.

Item (ii) required the students to opt for an alternative, which is not the importance of agriculture in the economic development of Tanzania. This item examined the students' knowledge on the importance of agriculture in economic development. The correct option was A (Improves infrastructures). The incorrect alternatives were B (Offers labour market), C (Earns foreign exchange) and D (Market for industrial goods). Most of the students attempted this item correctly signifying good understanding of the importance of agriculture in economic development as represented in alternatives B, C and D.

In item (iii), the students were required to choose an alternative, which is a class of cattle kept for meat production. The item tested the students' knowledge of classes of cattle according to the type of products produced and work performed. The correct response was C (Beef cattle) whereas the incorrect alternatives were A (Dairy cattle), B (Draught cattle) and D (Dual-purpose cattle). Majority of the students gave correct response. This is a sign that they had good mastery of the classes of cattle. Option A is for cattle kept for milk production, B is cattle kept for performing farm work and D is cattle kept for producing both milk and meat.

Item (iv) required the student to choose an alternatives which represents the problem that could happen when land is planted without carrying out tillage operations. The item assessed the students' knowledge of the importance of tillage operations. The correct answer was C (Growth of weeds). The distractors were A (Occurrence of soil erosion), B (Outbreak of diseases) and D (Loss of soil fertility). Most of the students attempted incorrectly this item showing to possess inadequate knowledge of the importance of tillage. The students failed to know that one of the advantages of tillage operations is to control weeds in which they are killed and buried to decompose. Most of them were attracted to alternatives A and D which are negative effects of

heavy tillage operations. Alternative B is a result of many factors where zero tillage in not among the factors.
In item (v), the students were required to choose an option, which is a method of planting recommended to be used when planting small seeds that need close spacing. The item tested the students' understanding of the sowing methods. The correct response was D (Broadcasting). The distractors were A (Intra-row planting), B (Inter-row planting) and C (Dibbling). Most of the students gave the correct response by opting for broadcasting as a method used to plant small seeds at a close spacing. This method involves scattering the seeds randomly around the land. This suggests that, the students were knowledgeable about sowing methods. Distractor A and B are types of row planting spacing for distance between plants within the row and distance between rows respectively. Similarly, alternative C was incorrect since it is a planting technique whereby a dibbler is used to mark out holes for planting seeds or seedlings at a definite depth and fixed spacing.

In item (vi) the students were required to choose an option which is a reason for planting cowpeas two months before the end of the main rain. The item tested students' understanding of the ecological requirements for production of cowpeas. The correct option was C (Needs dry when maturing). The incorrect alternatives were A (Needs wet soils), B (In order to avoid pest attack) and D (Require cool climate). Majority of the students who attempted this question opted for incorrect alternatives A, B and D. This indicates inadequate knowledge and skills on production of cowpeas. Technically, cowpeas require less rainfall to grow and mature, and therefore yield well in marginal rainfall areas since it needs dry spell at maturing stage.

In item (vii), the students were required to choose an alternative which represents the first step a farm manager should consider when making decision on whether to produce maize or not. The item tested students' understanding of the process of decision making in farm management. The correct answer was B (Identification of opportunity). The distractors were A (Choose among alternatives), C (Identification of alternative solution) and D (Take action). Most of the students provided a correct answer in this item. This signifies that the students possessed adequate knowledge of the steps to be followed when making decisions. The first step to be considered in

making decision in production is to identify the opportunity which can be a problem or demand in that locality. Alternatives A, C and D despite being the other steps of the decision making process in farm production, do not meet the requirement of the question.

Item (viii) required the students to choose an alternative with the correct percentage of mineral matter in the soil. The item examined students' understanding of soil constituents. The correct response was C (45%). The distractors were A (65%), B (55%) and D (35%). Most of the students answered the item correctly demonstrating that they had sufficient knowledge of constituents of the soil. Soil constitute mineral matter, air, water, organic matter and living organisms which are distributed in percentage by volume that is 45%, 25%, 25% and 5% respectively in ideal soil.

In item (ix), students were required to choose an alternative that represents a good crop combination for inter-cropping practices. The item tested the students' knowledge of inter-cropping practices. The correct option was C (Maize and beans) whereas alternatives A (Maize and cassava), B (Sorghum and wheat) and D (Cassava and yams) were incorrect. Most of the students provided correct response in this item. This is a reflection that they had adequate knowledge and skills on intercropping practices. Inter-cropping is a system of cropping whereby two or more crops are simultaneously grown in rows in the same piece of land. A good example of inter-cropping practice is the combination of maize and beans because the intercrop should preferably be a legume for maintaining fertility and productivity of the soil. The distractor A and B are crops with the same growth habit, therefore, if included in a combination they will be competing for light and nutrients. Thus, they are not good choices for the inter-cropping practice. Moreover, alternative D, both cassava and yams are heavy feeders therefore they will deplete the nutrients from the soil.

In item (x), the students were required to choose an option which explains the influence of packing pattern of soil particles in crop production. The item examined students' understanding of the importance of soil structure in crop production. The correct response was B (1 and 2). The distractors were A (1 and 3), C (2 and 3) and D (3 and 4). Majority of the students provided incorrect responses indicating a poor understanding of the concept of soil structure. Soil structure is an important aspect of soil physical property in

crop production because it has an influence in water holding capacity of the soil and root penetration.

Distractor A, C and D are pairs of responses where one member (Influence absorption of nutrients) is not among the importance of soil structure.

2.1.2 Question 2: Matching Items

The question consisted of five items from the topic of Basics of Farm Management. Each item carried one (1) mark making a total of five (5) marks. The students were required to match the items in List A with their corresponding responses in List B by writing a letter of a correct response from List B below the corresponding item number in List A. List A consisted of five description of physical farm records whereas List B consisted of seven types of farm records. The objective of this question was to test students' understanding of different types of farm records.

List A	List B
(i) A record that shows important events	A Marketing records
(ii) A record that shows the amount of produce.	B Farm diary
(iii) A record that shows the list of assets in the farm	C Health records
(iv) A record that shows various practices like planting, weeding and harvesting	D Farm map
(v) A record that shows comparisons of prices of particular products at different markets.	E Production records
	F Field operation records
	G Inventory records

The question was attempted by 23,886 (100%) students of whom 7,169 (30.0%) scored from 0.0 to 1.0 mark, 9,786 (41.0%) from 2.0 to 3.0 marks and 6,931 (29.0%) from 4.0 to 5.0 marks. Figure 2 represents the students' scores on the question.

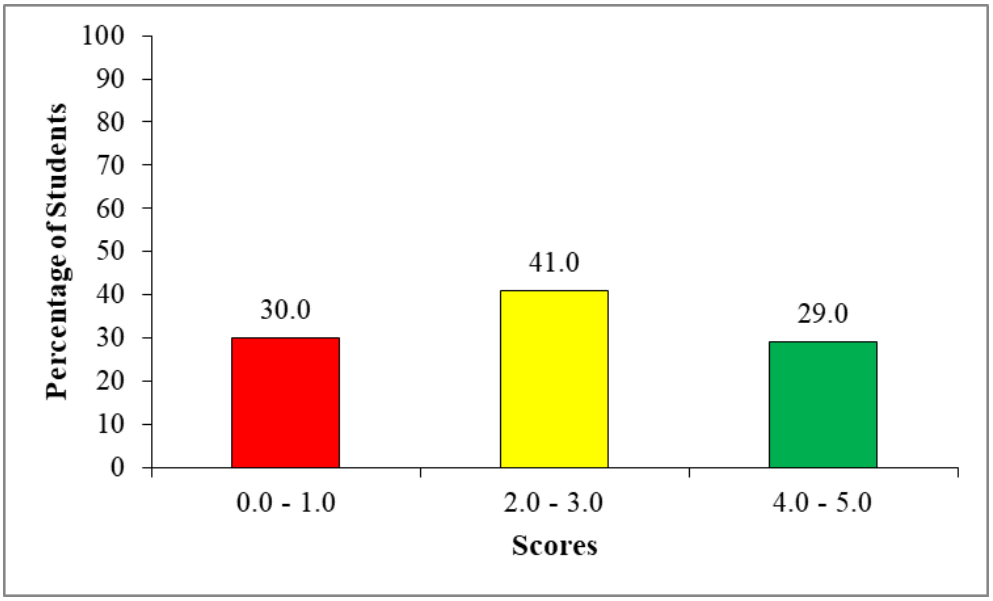


Figure 2: *Distribution of the students' scores on Question 2*

Figure 2 shows that 70.0 per cent of the students scored from 2.0 to 5.0 marks and 30 per cent from 0.0 to 0.1 mark. These data indicate that the students' performance on the question was good.

Analysis of students' responses showed that items (i), (iii) and (v) were attempted correctly by most of the students whereas items (ii) and (iv) were incorrectly attempted. Analysis of students' responses in each item is provided here under:

In item (i), most of the students chose the correct response to a record that shows important events in a farm. The correct response was B (farm diary) signifying the students' familiarity with the uses of farm dairy.

In item (ii), majority of the students provided incorrect responses to the record that shows the amount of produce. The correct response was E (Production records). Most of them were attracted to option F (Field operation records). Field operation records is a record showing various practices on the farm. The students demonstrated inadequate understanding of production records..

In item (iii), majority of the students provided correct responses to a record that shows a list of assets in the farm. The correct response was G (inventory records) showing them to have good understanding of the record.

In item (iv), most of the students provided incorrectly responses to the record showing various practices like planting, weeding and harvesting. The correct response was F (Field operation records). Most of them were attracted to option E (Production records). Production record is a record that show amount of produce. This indicates the students' inadequate knowledge of field operation records.

In item (v), almost all students who attempted this item provided a correct response A (marketing records) to the record that shows comparisons of prices of particular products at different markets. This is an indication of good mastery of the concept of market records.

2.2 SECTION B: SHORT ANSWER QUESTIONS

2.2.1 Question 3: Introduction to Livestock Production

The question consisted of parts (a) and (b) carrying a total of 10 marks. The students were required to: (a) provide four disadvantages of practicing continuous grazing system and (b) analyze the following livestock classes and give an example in each case (i) Dairy cattle (ii) Beef cattle (iii) Dual purpose cattle and (iv) Broilers. The question assessed students' knowledge and skills on the concepts of continuous grazing and livestock classification.

The question was attempted by 23,886 (100%) students out of whom 14,466 (60.6%) scored from 0.0 to 2.5 marks, 8,641 (36.1%) from 3.0 to 6.0 marks and 779 (3.3%) from 6.5 to 10 marks. Figure 3 portrays the students' scores on the question.

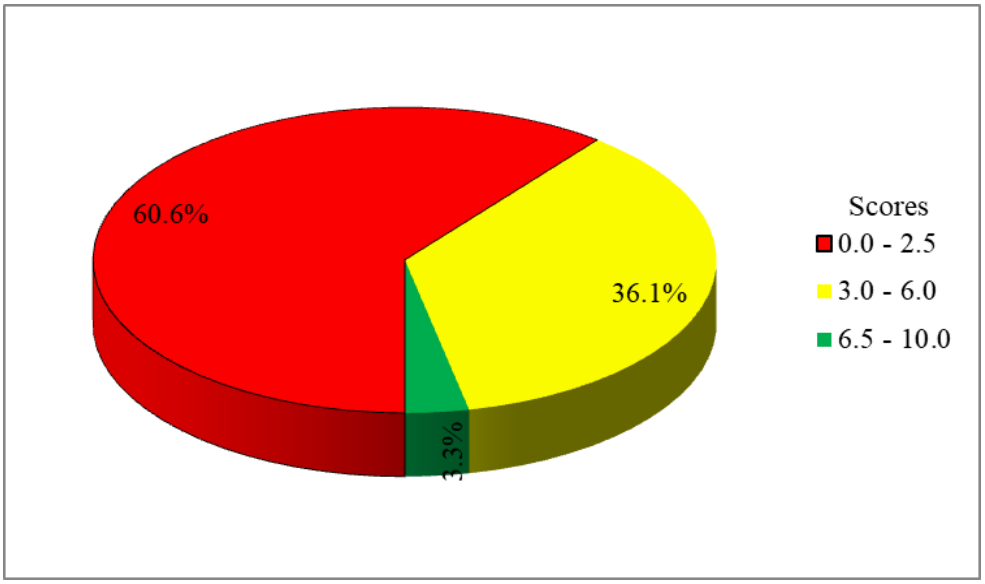


Figure 3: *Distribution of the students' scores on Question 3*

Figure 3 denotes that 39.4 per cent of the students scored from 3.0 to 10 marks and 60.6 per cent from 0.0 to 2.5 marks. The general performance of the students on the question was average.

Data indicate that 3.3 per cent of the students to have performed well on the question. Most of them managed to provide correct responses in almost all parts of the question. For instance, in part (a), they provided correct disadvantages of practising continuous grazing. These included (i) *there is a possibility of build –up of worms,* (ii) *if the area is overgrazed, soil erosion may also occur due to animal trampling,*(iii) *deteriaration of pastures* and (iv) *animals become heavily infested with external parasites.*

In addition, the students attempted well part (b) by analysing correctly livestock classes and correctly giving examples in each class. (i) Dairy cattle *are cattle which are kept for milk production, for example Friesian, Jersey, Ayrshire, Guernsey* (ii) Beef cattle *are cattle which are kept for the purpose of producing meat, for example Hereford, Galloway, Aberdeen Angus,* (iii) Dual purpose cattle *are cattle which are kept for the purpose of producing both meat and milk, for example Mpwapwa, Sahiwal and Red poll* and (iv) Broilers *are chicken which are kept for the purpose of producing meat, for example Jersey Black Giant, Light sussex* and *Orpington.* Such students' responses signify that, the students were knowledgeable about the

disadvantages of continous grazing systems and livestock classification. Extract 1.1 is an example of correct responses to the question.

3. (a) One of the challenges facing livestock farmers in Tanzania is continuous grazing systems. Provide four disadvantages of practicing this system.

(i) It causes soil erosion, continous grazing can cause soil erosion during rainy season and strong winds. This is especially take place when large number of cattle are kept in small area.

(ii) It can cause loss of soil fertility, continous grazing also destroys the fertility status of the soil because the crop residue which would decompose it into the soil will be eaten by livestock.

(iii) Livestock are exposed to bad weather conditions, In this system, livestock are exposed in rain especially during spring season and also livestock are expose in sun during the day so lead to health problems.

(iv) It can increase chance of diseases to livestock, In this system, livestock are every day taken to the same pasture area so if the pasture area is in remote places, the livestock will be affected by Tsetse-fly (Sleeping sickness).

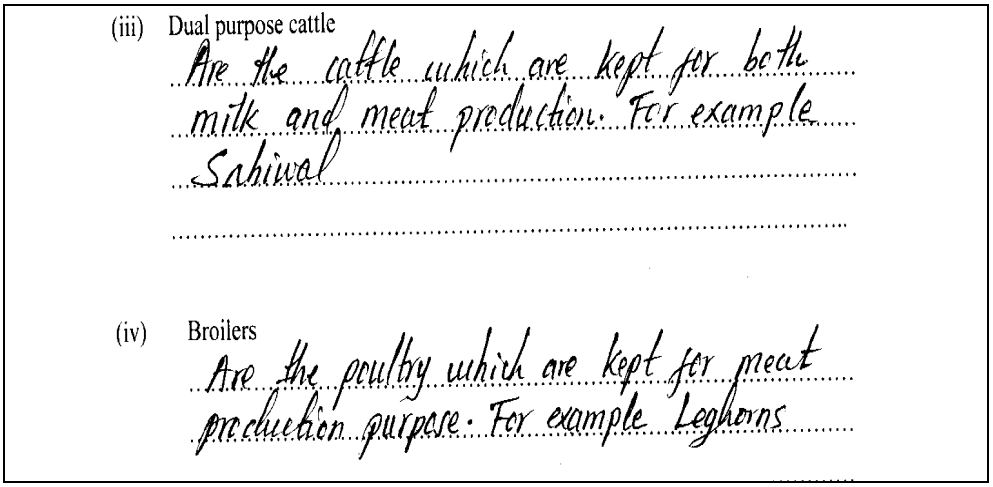
(b) You are invited to the livestock farming meeting to create an awareness on the classes of livestock among farmers. Analyse the livestock classes basing on the following classes and give one example for each.

(i) Dairy cattle

Are cattle which are mainly kept for the purpose of milk production: Example friesian

(ii) Beef cattle

Are cattle which are kept for meat production purpose. For example Hereford



Extract 1.1: *A sample of the student's correct responses to Question 3*

Extract 1.1 exemplifies responses from the student who attempted well in all parts of the question. This shows that, the student was knowledgeable on the disadvantages of continuous grazing system and livestock classification.

The students who had average performance on the question constituted 36.1 per cent. Most of them were able to analyse the livestock classes and gave correct examples in part (b). In part (a), the students failed to provide correct disadvantages of the continuous grazing system. They mistook the concept of continuous grazing system for other grazing system like free range system and rotational grazing system. This led them providing the disadvantages of such systems instead of those of continous grazing which is a system where animals are kept unrestricted and uninterrupted throughout the grazing season.

On the other hand, 60.6 per cent of the students performed weakly. Majority of them performed poorly in almost all parts of the question. They were unable to provide the disadvantages of practising the continuous grazing system in part (a). Instaed, some of the students gave pointa on the importance of agriculture over disadvantages of continuous grazing. Examples of such incorrect responses were: *provide food, provide income, provide raw materials for industry, provide employment* and *source of foreign exchange*. In some cases, the students mentioned challenges facing agriculture development such as *poor market, poor technology and*

communication, lack of capital and pests and diseases outbreak as the disadvantages of the continous grazing system. Other students provided a variety of incorrect responses such as *drainage, increase land productivity, poor livestock animal, livestock are not good in the soil and death of an animal*.

Similarly, the students failed to analyse livestock classes and give examples in part (b). Some of them mixed up the interpretations as follows: (i) dairy cattle is *used for meat.* (ii) beef cattle is *used for milk*. (iii) dual purpose cattle *is used for work* and (iv) broiler *is used for egg production*. This signifies that the students lacked knowledge of the contionous grazing system and livestock classification. Extract 1.2 is a sample of incorrect responses in the question.

3. (a) One of the challenges facing livestock farmers in Tanzania is continuous grazing systems. Provide four disadvantages of practicing this system.

(i) It law ~~reduce~~ increase of water sources

(ii) It is law erostion of power

(iii) It law increase of water

(iv) It law production of water

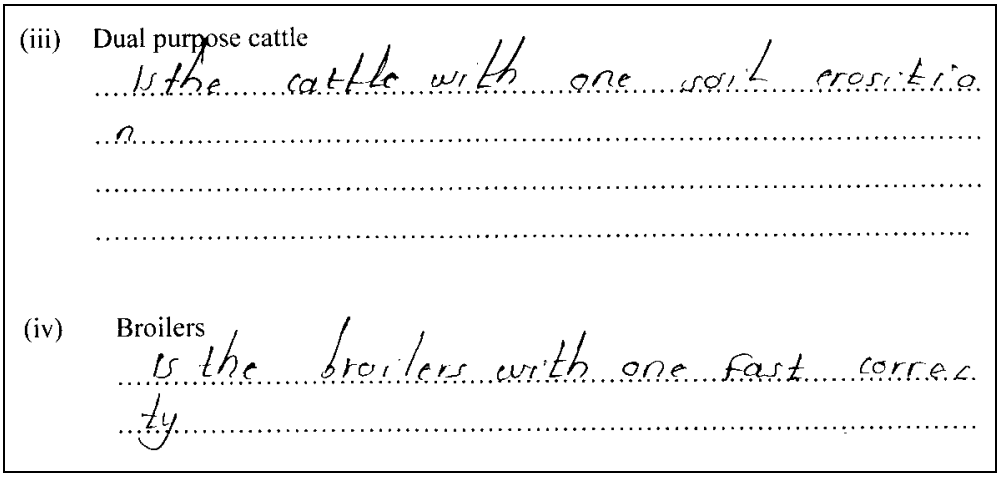
(b) You are invited to the livestock farming meeting to create an awareness on the classes of livestock among farmers. Analyse the livestock classes basing on the following classes and give one example for each.

(i) Dairy cattle

Is the cattle with one other fast correcty

(ii) Beef cattle

is the cattle with one fast correcty



Extract 1.2: *A sample of the student's incorrect responses to Question 3*

Extract 1.2 demonstrates a sample of incorrect responses from a student who lacked knowledge of the subject matter in all parts of the question.

2.2.2 Question 4: Introduction to Soil Science

The question had parts (a) and (b) carrying a total of 10 marks. The students were required to: (a) give five reasons on the importance of knowing soil texture of the farm in crop production and (b) calculate the bulk density of the soil which has a dry mass of 250g with a volume of 150 cm^3. The question examined the students' knowledge of physical properties of the soil.

The question was attempted by 23,886 (100%) students among whom 13,968 (58.5%) scored from 0.0 to 2.5 marks, 8,405 (34.2%) from 3.0 to 6.0 marks and 1.513 (7.3%) from 6.5 to 10 marks. Figure 4 indicates the students' scores on the question.

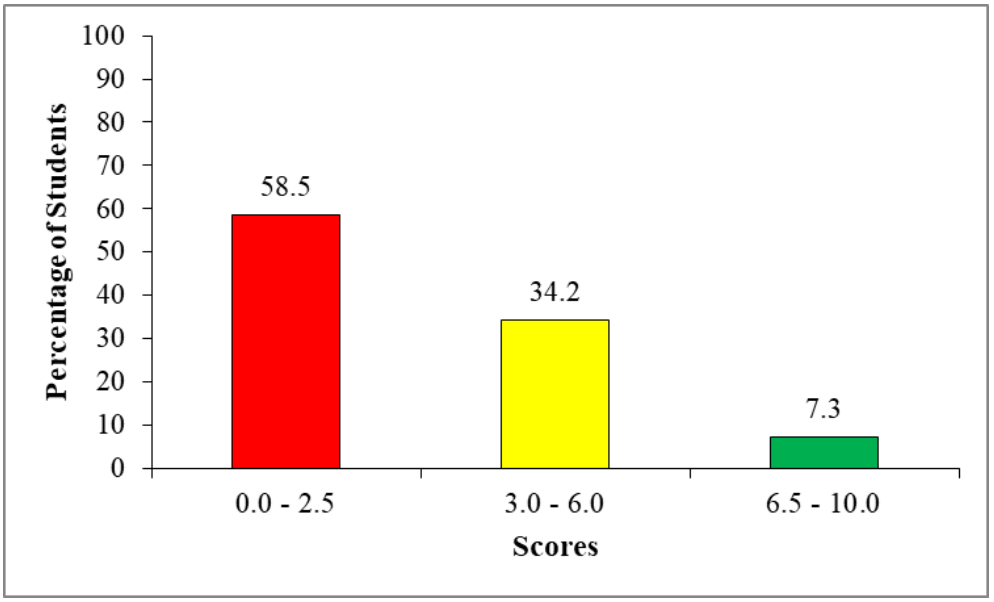


Figure 4: *Distribution of the students' scores on Question 4*

According to Figure 4, 41.5 per cent of the students scored from 3.0 to 10 marks and 58.5 per cent from 0.0 to 2.5 marks. The general performance of the students on the question was average.

Data analysis reveals that 7.3 per cent of the students had good performance on the question. Majority of them provided correct responses nearly in all parts of the question. In part (a), they were able to give correct points on the importance of knowing soil texture of the farm in crop production. Responses given include *soil texture influence aeration of the soil in the farm, indicates the extent of nutrients leaching for a particular soil, is an indicator of microbial activities in a soil,* and *soil texture indicates soil fertility status of the soil.*

Likewise, in part (b), they managed to calculate the bulk density of the soil by providing correct computation as shown below;

Data given

Mass of dry soil sample = 250g

Total volume of soil = 150cm^3

Required: Soil bulk density (g/cm^3)

Solution

Formula

Bulk density (g/cm^3) = mass of dry soil (g)

$$= \frac{250g}{150\ cm^3}$$

$$= 1.667g/cm^3$$

Therefore, the bulk density of the given soil is 1.667g/cm^3

The responses provided prove that, the students were knowledgeable about the importance of soil texture and calculation of bulk density. Extract 2.1: indicates responses from a student who did well on this question

4. (a) Soil texture is a physical property which influences the behaviour of soil in various ways. Why is it important to know soil texture of the farm in crop production? Give five reasons.

(i) Soil texture determines the water holding Capacity of the soil; due to drameters of the soil particles with the soil texture a farmer or an individual can know the water holding capacity

(ii) Soil texture determine the soil aeration; the particles diameters of the soil helps one to know the ~~aeration~~ easy movement of air and water within the soil.

(iii) Soil texture determines the fertility of the soil; the way the particles ~~are~~ of the soil are packed determines the fertility of the soil for example; when particles of the soil are packed the fertility is high

(iv) Soil texture determines the soil temperature; the temperature of the soil is determined by soil texture cause the soil like clay ~~the~~ has ~~black~~ blackish colour which absorp the heat and increase the soil temperature.

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(v) Soil texture determines which crop to be planted in a certain area's soil; there are some crops which does not favour other type of soil like sandy, soil texture will help to determine

(b) Calculate the bulk density of the soil which has a dry mass of 250 g with a volume of 150 cm^3.

Data given;
Mass = 250g
Volume = 150cm^3
From;
Bulk density = Mass of oven dry / volume of the soil
= 250g / 150cm^3
1.67g/cm^3
∴ The bulk density is 1.67 g/cm^3

Extract 2.1: *A sample of the student's correct responses to Question 4*

Extract 2.1 presents a response from a student who did well in all parts of the question. He/she demonstrated good knowledge of soil texture and bulk density.

The question registered 34.2 per cent of the students with average performance. Most of them scored averagely in both part (a) and (b). In part (a), the students did not exhaust all of the points on the importance of soil texture. In part (b), besides arriving at the correct value of the bulk density they wrote the formula for calculating particle density.

Nevertheless, the students who had weak performance accounted 58.5 per cent. Majority failed to express the importance of knowing soil texture of the farm in crop production in part (a). This is evidenced by a variety of incorrect responses they provided such as; *source of income, it maintains seeds, it has the soil nutrients, it controls pest and diseases, it influences soil pH* and *it*

controls soil erosion. Some of them mentioned the factors which influence soil formation such as *nature of the parent materials, topography of an area, length of time, climate of the area and living organisms,* as important reasons of knowing soil texture of the farm in crop production. This suggests that, such students were short of knowledge of how soil texture as one of the physical properties of soil influence crop production.

Moreover, the students failed to compute the bulk density of the soil in part (b) by giving incorrect computation as shown from one of the students here under:

$$\text{Bulk density of the soil} = \frac{\frac{M \times V}{D}}{\frac{250 \times 150}{100}} = 2{,}750$$

This demonstrates that the students had inadequate knowledge and skills on calculating bulk density. Extract 2.2 shows one of the students' incorrect responses to the question.

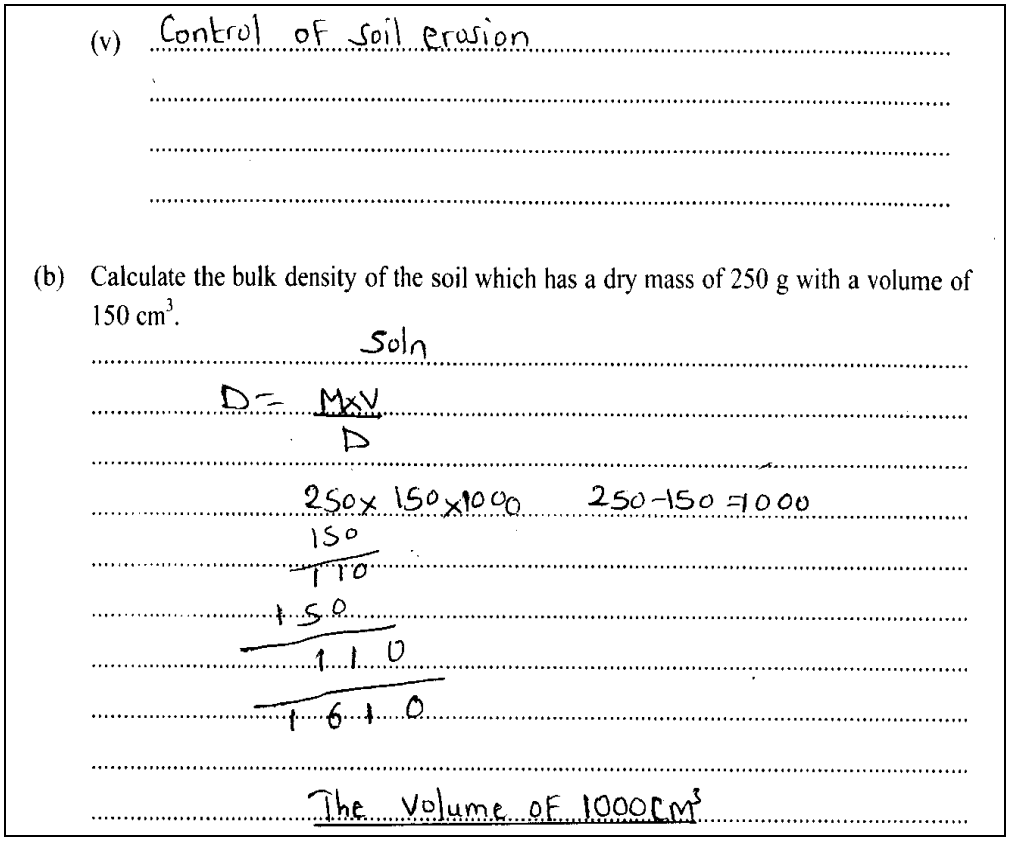
4. (a) Soil texture is a physical property which influences the behaviour of soil in various ways. Why is it important to know soil texture of the farm in crop production? Give five reasons.

(i) It simplify work

(ii) It save time

(iii) change of soil

(iv) Must not be expensive



Extract 2.2: *A sample of the student's incorrect responses to Question 4*

Extract 2.2 illustrate incorrect responses from a student who responded poorly in all parts of the question. The student failed to express the importance of knowing soil texture of the farm in crop production and incorrectly calculated the bulk density in part (a) and (b) respectively..

2.2.3 Question 5: Mechanization in Agriculture

The question comprised parts (a) and (b) carrying a total of 10 marks. The students were tasked to: (a) give three advantages and two disadvantages of solar power and (b) account for the five reasons for peasants to prefer animals as a source of farm power in most rural areas. The question evaluated students' understanding of sources of farm power..

The question was attempted by 23,886 (100%) whereby 18,104 (75.8%) scored from 0.0 to 2.5 marks, 4,849 (20.3%) from 3.0 to 6.0 marks and 933

(3,9 %) from 6.5 to 10 marks. Figure 5 shows the students' scores on the question.

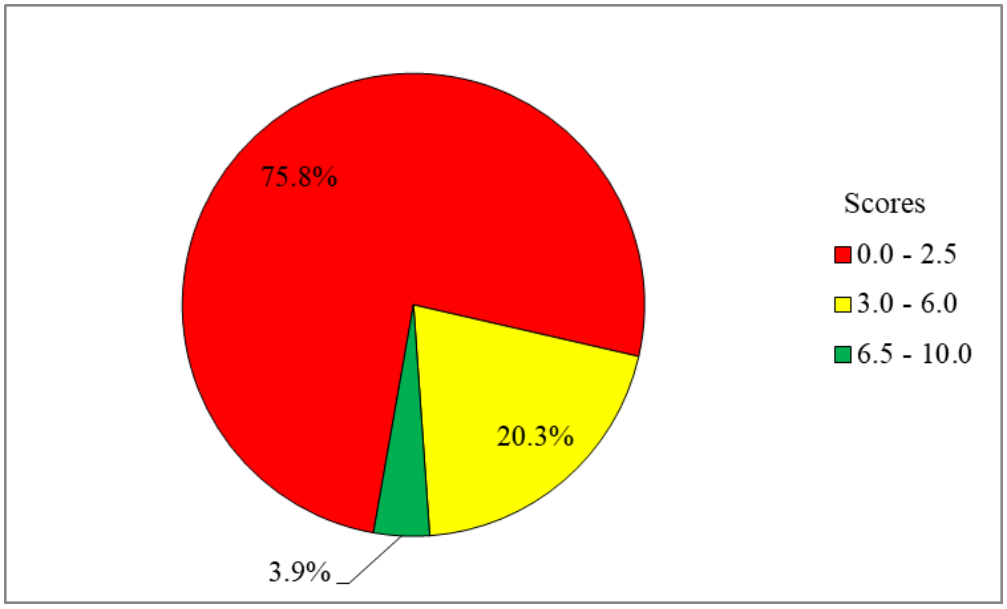


Figure 5: *Distribution of the students' scores on Question 5*

Referring to Figure 5, majority of students (75.8%) scored from 0.0 to 2.5 marks while 24.2 per cent from 3.0 to 10 marks, The general performance of the students on the question was weak.

The students who had weak performance constituted 75.8 per cent. These students attempted incorrectly in almost all parts of the question. In part (a), the students failed to give the advantages and disadvantages of solar power. Examples of the incorrect responses for the advantages were: *the source of money, it helps people to burn crops, the crop can be yellow, is the source of accident, used for animal feed* and *it provide rain formation* instead of *it requires less skills to operate, it is cheap, it does not cause environmental pollution* and *it is easily available to many environments*. The incorrect disadvantages given were such as*; cause death to human beings, it causes drought, it destroys the plant, it increases pests and diseases, poor labour and market and increases soil erosion* instead of *installation and equipment are costful, it cannot be used directly in some farm activity* and *it is not reliable due to weather condition.*

This is an indication that the students were not knowledgeable about the advantages and disadvantages of solar power. Similarly, in part (b) they were unable to account for the reasons for peasants to prefer animals as a source of farm power in most rural areas. Instead, some of them provided various sources of power like; *human source of power, animal source of power, wind source of power* and *water source of power.* In some cases, they provided different incorrect responses such as *source of foreign exchange, it increases moisture to the soil, and it increase population of pasture.* The nature of responses provided by students is an evidence that they possessed inadequate knowledge and understanding of the justification of using animal power in rural area. The reasons for peasants to use animal power in rural areas are; *it requires less skill to operate, the cost of running tractors is relevant higher, some areas the land is mountainous with irregular shape, most areas for cultivation are relatively small* and useful *where other sources of power are not available*. Extract 3.1 present a sample response from a student who attempted poorly in the question.

5. (a) Solar power is one of the common sources of power particularly in rural areas of Tanzania. What are the three advantages and two disadvantages of the named power?

(i) Advantages

- It proved the source of wind power in the Society.
- It proved the Increases of money.
- It proved govenment Support.

(ii) Disadvantages

- It used to not loss of money.
- It used to poor goverment support.

(b) Account for the five reasons for why peasants prefer animals as a source of farm power in most rural areas.

(i) It because the animals as a source of Farm puwer it used to the particularly of the humani being.

(ii) It because the animal are the Farm puwer it used to the source of the gas of tanzania

(iii) The animals are the sowse of Farm puwer because are the most of to insrease of money

(iv) The animal are the source of power because are the Farmer to produce & of meat.

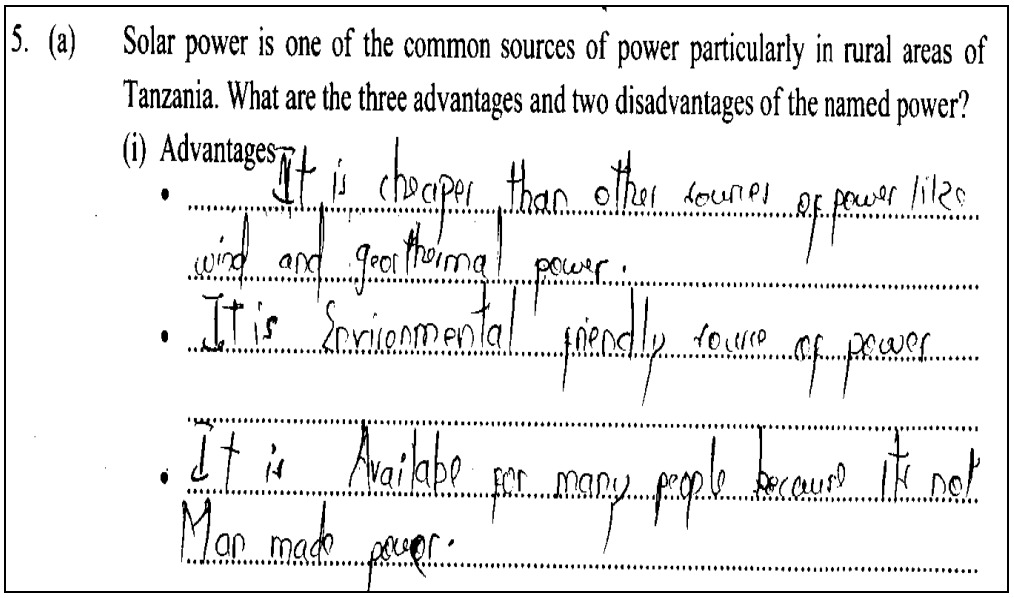
(v) The animal are the source of puwer because are the production of work perfo rmed of improve of Infrastructure.

Extract 3.1: *A sample of the student's incorrect responses to Question 5*

Extract 3.1 portrays responses from one of the students who failed to provide correct responses in all parts of the question.

Data analysis shows that 20.3 per cent of the students had average performance. Most of these students were able to justify the use of animal power by peasants in most rural areas in part (b). However, in part (a), they provided incorrect advantages and disadvantages of solar power. The students seemed to have an idea that solar power comes directly from sunrays without knowing it has to be generated. As a result of this, they gave responses like *source of vitamin A, produce high power and generate electricity as its advantages and has burning effect, cause evaporation of water bodies and wilting of plant* as disadvantages.

Conversely, 3.9 per cent of the students performed well on the question. Most of them managed to provide correct responses in both parts of the question. The students correctly gave advantages and disadvantages of solar power. Furthermore, in part (b) they were able to give reasons for peasants to use animal power in most rural areas. This indicates that the students possess adequate knowledge of the subject matter as shown in Extract 3.2.


5. (a) Solar power is one of the common sources of power particularly in rural areas of Tanzania. What are the three advantages and two disadvantages of the named power?

(i) Advantages

- It is cheaper than other source of power like wind and geothermal power.
- It is Environmental friendly source of power
- It is Avaiable for many people because it not Man made power.

(ii) Disadvantages

- It depends on ~~weather~~ condition of the Atmosphere
- It requires high capital to invest.

(b) Account for the five reasons for why peasants prefer animals as a source of farm power in most rural areas.

(i) Animal power it's cheap than other power like tractor power

(ii) It does not need fuel and lubricant

(iii) It is economically source of power in rural areas because Most people have small Area of land.

(iv) Animal power need low initial capital to invest

(v) Animal it's easier to operate than tractor power.

Extract 3.2: *A sample of the student's good responses to Question 5*

Extract 3.2 shows good understanding of solar power and animal power from a student who provided correct responses to both parts of the question.

2.2.4 Question 6: Principles of Crop Production

The question had parts (a) and (b) carrying a total of 10 marks. The students were required to: (a) give five reasons for a farmer to consider planting time when planning farming activities and (b) justify the benefits of early planting in crop production by giving five points. The question was set to assess students' knowledge and skills of planting practice.

The question was attempted by 23,886 (100%) students where 20,602 (86.3%) scored from 0.0 to 2.5 marks; 2,888 (12%) from 3.0 to 6.0 marks and 396 (1.7%) from 6.5 to 10 marks. The distribution of students' scores on this question is shown in Figure 6.

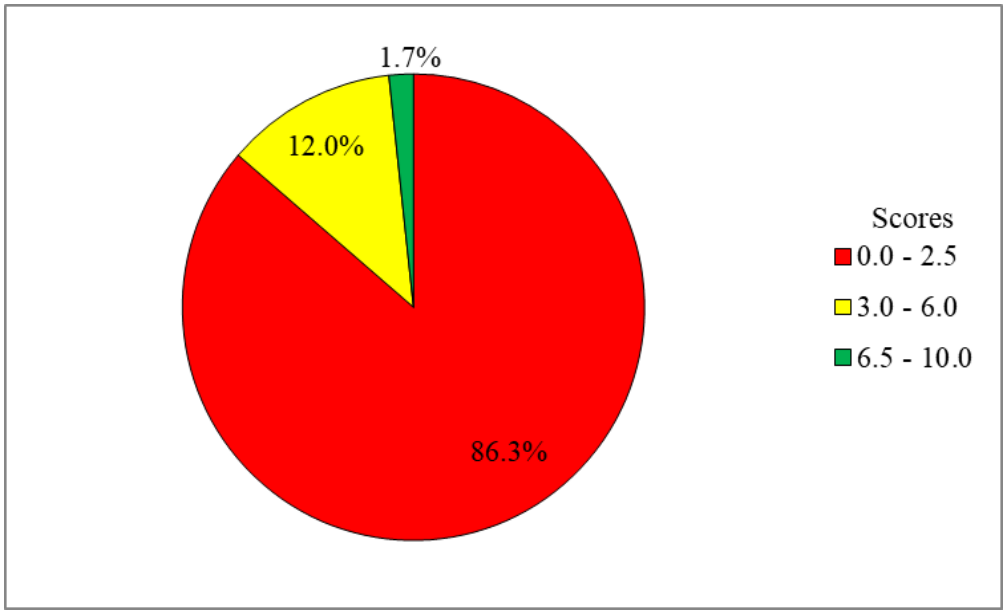


Figure 6: *Distribution of the students' scores on Question 6*

Figure 6 indicates that, the majority of the students' (86.3%) scored from 0.0 to 2.5 marks, while 13.7 per cent from 3.0 to 10 marks. The general performance of the students on the question was weak.

As per statistics, 86.3 per cent of the students had weak performance. Analysis of their responses showed that the students attempted most parts of the question incorrectly. In part (a), they were unable to give reasons for farmers to consider planting time when planning farming activities. Most of their

responses focused on the principles of crop production that a farmer should have consider to carry out such as choice of land, land preparation, planting, weeding, water supply, control of pests and diseases and harvesting. The students misunderstood the demand of the question and some of them thought it demanded what should be planted hence provided responses such as *plants with different levels of nutrient utilization, plants with different growth habits, plants with different family and include leguminous plants* which were principles of crop rotation. Others gave external factors that affect crop production in general such as: *climatic factors, biotic factors, economic factors, edaphic factors and social factors*. The responses provided were not related to the demand of the question thus suggesting that the students were not familiar with the importance of farmers considering the planting time. The farmers should consider planting time since it has to do with *market demand, weather conditions at harvesting time, prevalence of pests and diseases, soil moisture content, types of crop to be planted* and *temperature.*

Likewise, the students failed to justify the benefits of early planting in part (b). Some of them came up with the importance of crop production and others provided the advantages of agriculture instead of benefits of early planting. Such responses include; *is a source of food, source of income, it provides raw materials for industry, source of foreign exchange and it provide employment*. The benefits of early planting include *the crops make maximum use of rainfall during the rainy season, crops are less likely to be affected by pests, annual crops can effectively compete with weeds when planted early, it leads early harvesting* and *it reduces competition on various farm operation*. The act of students providing such unrelated responses to the demand of the question signifies that they were not conversant with the benefits of early planting. Extract 4.1 shows response of a student who performed poorly on this question.

6. (a) Planting time affect the outcome of crop production in many ways. Why should a farmer consider it when planning farming activities? Give five points.

(i) Give enough time for decomposition of organic matter

(ii) Decomposition of weeds in the soil

(iii) Help farmer to perform for other farm operations eg weeding

(iv) Enough time help to expose pest to the sun and predators

(v) Help in harvesting of crops in a particular time

(b) Early planting has several benefits to the farmer and affects crop production in many ways. Justify this statement by giving five points.

(i) Gives enough time to expose pests to the predators like birds

(ii) Help the farmer to perform other farm operation

(iii) Help to harvest crop in a planned time

(iv) Enough time for decomposition of weeds

(v) Give enough time for the decomposition of organic matter

Extract 4.1: *A sample of the student's incorrect responses to Question 6*

Extract 4.1 shows responses from a student who performed poorly on both parts of the question. The student gave responses, which were contrary to the demand of the question.

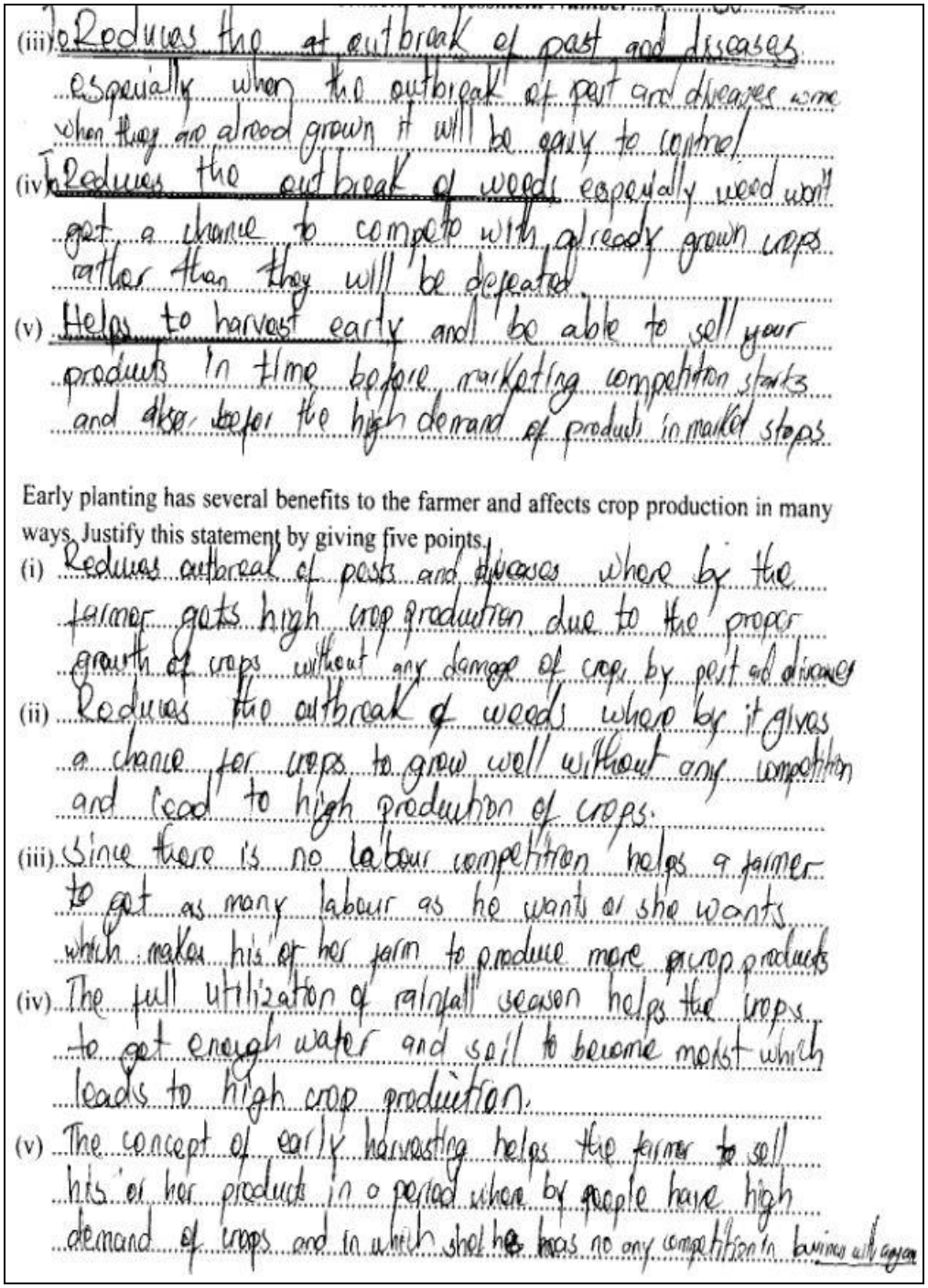
The statistics denoted 12 per cent of the students to have performed averagely. Most of them provided correct responses in part (b) for the benefits of early planting. However, the students failed to give reasons for farmers to consider planting time when planning farming activities in part (a). Some of the students responded by providing what should be considered during planting like sowing depth, seed rate and crop spacing instead of importance of considering the planting time. This imply that they had partial understanding of the subject matter.

On the other side, the students who had good performance on the question constituted 1.7 per cent. The students' responses met the demand of both parts of the question. The students managed to give the importance of considering planting time in part (a) and correctly gave the benefits of early planting in part (b). This is an indication that they had good mastery of the subject matter. Extract 4.2 displays an example of the correct response from one of the students who performed well on this question.

6. (a) Planting time affect the outcome of crop production in many ways. Why should a farmer consider it when planning farming activities? Give five points.

(i) So as to use full utilization of rainfall which will reduce them the cost for irrigation.

(ii) To avoid labour competition. When a farmer plants early that means he or she will be able to get many labour as he or she wants without competing with anyone.


(iii) Reduces the at outbreak of past and diseases especially when the outbreak of past and diseases were when they are already grown it will be easy to control

(iv) Reduces the outbreak of weeds especially weed will get a chance to compete with already grown crops rather than they will be defeated

(v) Helps to harvest early and be able to sell your products in time before marketing competition starts and also before the high demand of products in market stops

Early planting has several benefits to the farmer and affects crop production in many ways. Justify this statement by giving five points.

(i) Reduces outbreak of pests and diseases where by the farmer gets high crop production due to the proper growth of crops without any damage of crop by pest and diseases

(ii) Reduces the outbreak of weeds where by it gives a chance for crops to grow well without any competition and lead to high production of crops.

(iii) Since there is no labour competition helps a farmer to get as many labour as he wants or she wants which makes his or her farm to produce more crop products

(iv) The full utilization of rainfall season helps the crops to get enough water and soil to become moist which leads to high crop production.

(v) The concept of early harvesting helps the farmer to sell his or her products in a period where by people have high demand of crops and in which she/he has no any competition in business with others

Extract 4.2: *A sample of the student's correct response to Question 6*

Extract 4.2 justifies responses from a student who responded correctly to all parts of the question. He/she demonstrated good mastery of concepts of planting time and early planting.

2.2.5 Question 7: Introduction to Crop Production

The question consisted of parts (a) and (b) carrying a total of 10 marks. Students were required to: (a) give two advantages and three disadvantages of the system of growing maize on the same field season after season and (b) answer the question that followed in a situation where a farmer grew cotton, maize and beans in three years whereby only one crop was grown in a year on the same field before fallowing it on the fourth year. (i) why did the farmer grow maize and cotton interchangeably (ii) what advantage did the farmer get by including beans in this growing cycle? (iii) Give a reason for the farmer to fallow the field on the fourth year (iv) what are the two advantages of the cropping system used by the farmer, The question tested the students' knowledge and skills about cropping systems.

The question was attempted by 23,886 (100%) students out of whom 16,443 (68.8%) scored from 0.0 to 2.5 marks, 5,672 (23.8%) from 3.0 to 6.0 marks and 1,771 (7.4%) from 6.5 to 10 marks. Figure 7 indicates the students' scores on the question.

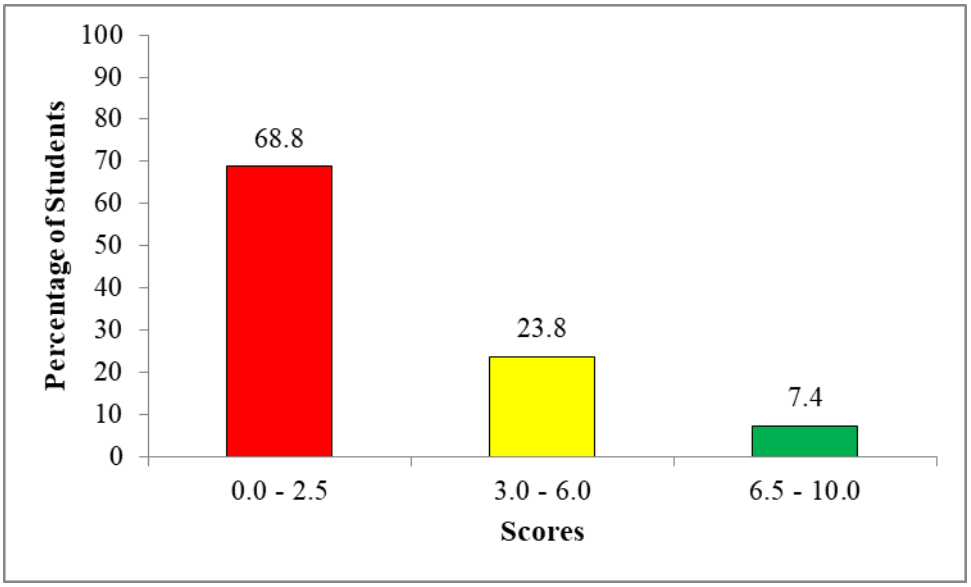
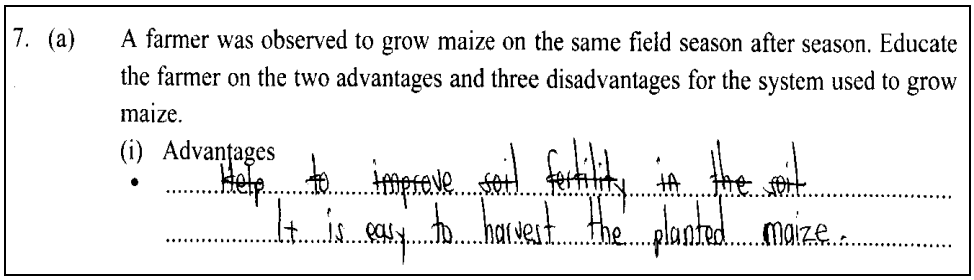


Figure 7: *Distribution of the students' scores on Question 7*

Figure 7 shows that 31.2 per cent of the students scored from 3.0 to 10 marks, whereas 68.8 per cent from 0.0 to 2.5 marks. The performance of the students in the question was generally average.

The question was well performed by 7.4 per cent of the students. Before starting attempting the question, the students were required to identify the cropping system used in both parts of the question as per the scenario. They did so hence provided correct responses to both parts. In part (a), the students provided the advantages and disadvantages of monoculture as a system used. Examples of the advantages provided included *easy to weed, simplifies spraying crops against pests and diseases, it is also easy to harvest and estimate yield* and *easier to establish the recommended planting population for the crop*. The disadvantages given included; *the system may leads to an increase pests and diseases, the system is risky, there is high possibility of declining soil fertility and it may lead to soil erosion*.

Likewise, in part (b) they correctly identified the cropping system used as crop rotation and therefore provided correct responses as follows: (*i) it enhence nutrients cycling and soil fertility since maize is shallow rooted crop while cotton is a deep rooted crop as one of the principles of crop rotation, (ii) it improve fertility of the soil because beans are leguminous plant thus its roots are capable of fixing atmospheric nitrogen*. *(iii) The farmer fallowed the field in order to give time and enable soil to regain its natural fertility* and *(iv) cropping system- helps to control insect pest diseases and weeds and when legumes are included in a rotation, soil fertility is improved*. Their responses suggested that, they were knowledgeable and skilled about monoculture and crop rotation as cropping systems. Extract 5.1 indicates reponses from a student who performed the question well.


7. (a) A farmer was observed to grow maize on the same field season after season. Educate the farmer on the two advantages and three disadvantages for the system used to grow maize.

(i) Advantages

- Help to improve soil fertility in the soil
  It is easy to harvest the planted maize.

- It is easy to control pests and diseases.

(ii) Disadvantages

- This may cause soil erosion.
- It lead to the occurance of pests and diseases.
- It leads to the loss of soil fertility.

(b) A farmer grew cotton, maize and beans in three years on the same field. Only one crop was grown in a year. The farmer fallowed the field on the fourth year. Answer the following questions

(i) Why did the farmer grow maize and cotton interchangeably?

This is because of the principles of crop rotation which states the inter-change heavy feeder crops with lighter feeder crops in the rotation.

(ii) What advantage did the farmer get by including beans in this growing cycle?

The advantage which the farmer got by including beans in that growing cycle is that beans help to improve the soil fertility.

(iii)Give a reason for the farmer to fallow the field on the fourth year.

The reason for the farmer to fallow the field on the fourth year is to help to land to gain another nutrients in the soil.

(iv)What are the two advantages of the cropping system used by the farmer"?

- Help to control pests and diseases.
- Help to improve soil fertility.

Extract 5.1: *A sample of the student's correct responses to Question 7*

Extract 5.1 indicate responses from a student who performed well in the question. The student gave all correct responses required.

According to statistics, 23.8 per cent of the students had average performance. Most of them provided correct responses to items in part (b) with regard to the system of crop rotation. In part (a), majority mistook the concept of monoculture for monocropping; the result of which instead of providing advantages and disadvantages of monoculture they did so for monocropping which is a system of growing a single crop year after year on the same land.

Conversely, the students who performed weakly constituted 68.8 per cent. These students failed to identify the cropping systems in the scenarios of both parts of question hence responded incorrectly. In part (a), instead of giving the advantages and disadvanatges of the cropping system used, some students gave the advantages of growing maize. For example maize can be used as *food for human and animals, straws decompose to add fertility in the soil* and *control soil erosion* as advantages. Disadvantages provided were such as *attract pests and diseases, lead to hunger, big production cost*. Others provided a variety of incorrect responses that were not related

to the demand of the question like *it requires high capital, it is poisonous to animals and human beings, have low market, it take large space in a farm* and *it is used to eat insects*.

Moreover, examples of incorrect responses in part (b) were; (i) *maize is a crop for food and cotton is a cash crop, maize is the annual crop and cotton is a perennial crop* as reasons for interchanging maize and cotton in the rotation, (ii) *It remove fertile to the soil, it is costful, it produce maize, it is poison to the human being, produce chemical and it attract insects* for advantages of including beans in the growing cycles, (iii) *because farmer do not produce crop hence it produce low crop, it influence soil temperature, it help to produce crop production, it save the time and lack of enough land* as reasons for the farmer to fallow the field and (iv) *it provide manure to the soil, used as food, used as a source of foreign currency, it helps to get money* and *it improve market* as the advantages of cropping system used by farmers. The incorect responses provided to the question reflect the fact that the students lacked knowledge and skills of monoculture and crop rotation as the cropping system. Extract 5.2 presents responses from a student who attempted the question incorrectly.

7. (a) A farmer was observed to grow maize on the same field season after season. Educate the farmer on the two advantages and three disadvantages for the system used to grow maize.

(i) Advantages

- To decrease pest and disease

- To minimar chemical for user of maize

(ii) Disadvantages

- Increase pest and disease
- Does don not user chemical for growth maize
- Does not planting crop rotation

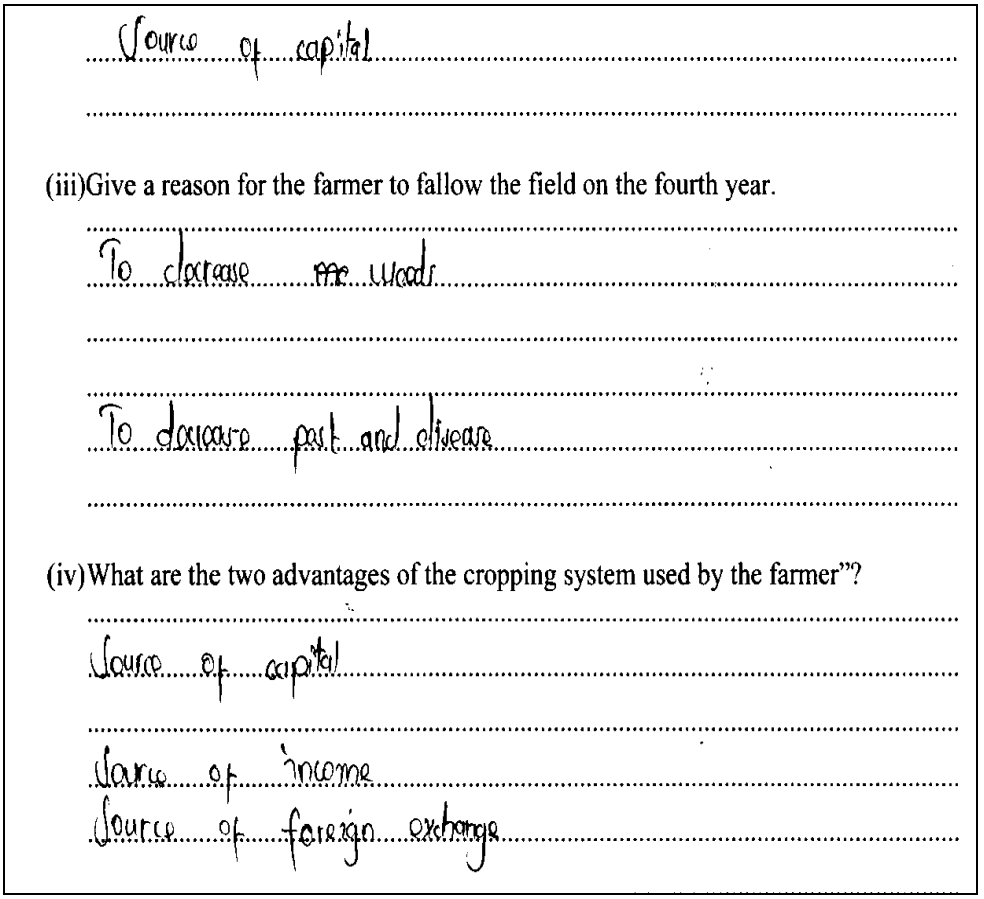
(b) A farmer grew cotton, maize and beans in three years on the same field. Only one crop was grown in a year. The farmer fallowed the field on the fourth year. Answer the following questions

(i) Why did the farmer grow maize and cotton interchangeably?

farmer grow maize and cotton is Cotton decrease and Maize increase

(ii) What advantage did the farmer get by including beans in this growing cycle?

Source of food for human being


Source of capital

(iii)Give a reason for the farmer to fallow the field on the fourth year.

To decrease the weeds

To decrease pest and diseare

(iv)What are the two advantages of the cropping system used by the farmer"?

Source of capital

Source of income

Source of foreign exchange

Exract 5.2: *A sample of the student's incorrect responses to Question 7*

Extract 5.2 shows poor understand of the concepts of monoculture and crop rotation as the cropping systems from a student who responded incorrectly to the whole question.

2.2.6 Question 8: Basics of Farm Management

The question was composed of parts (a) and (b) carrying a total of 10 marks. Students were required to: (a) give five reasons to justify a need for a farm manager to consider records in farming activities and (b) prepare a balance sheet to show the financial position of Mr. Kiboko's farm as at 30th March 2021 given the following situation: Cash in hand Tshs 20,000/=; cash in bank Tshs 50,000/=; debt payable Tshs 12,000/=; Wages Tshs 20,000/=; CRDB-Bank loan Tshs 120, 000/=. Other were Buildings values Tshs 80,000/=; Livestock worth Tshs 160,000/=; Debt receivable Tshs 10,000/=; Knapsack sprayer worth Tshs 5,000/=; Livestock feeds worth

Tshs 10,000/= and Farm produce worth Tshs 40,000/=. The question was intended to assess students' knowledge and skills of farm records.

The question was attempted by 23,886 (100%) students whereby 16,482 (69.0%) scored from 0.0 to 2.5 marks; 5,778 (24.2%) from 3.0 to 6.0 marks and 1,626 (6.8%) from 6.5 to 10 marks. Figure 8 depicts the students' scores on the question.

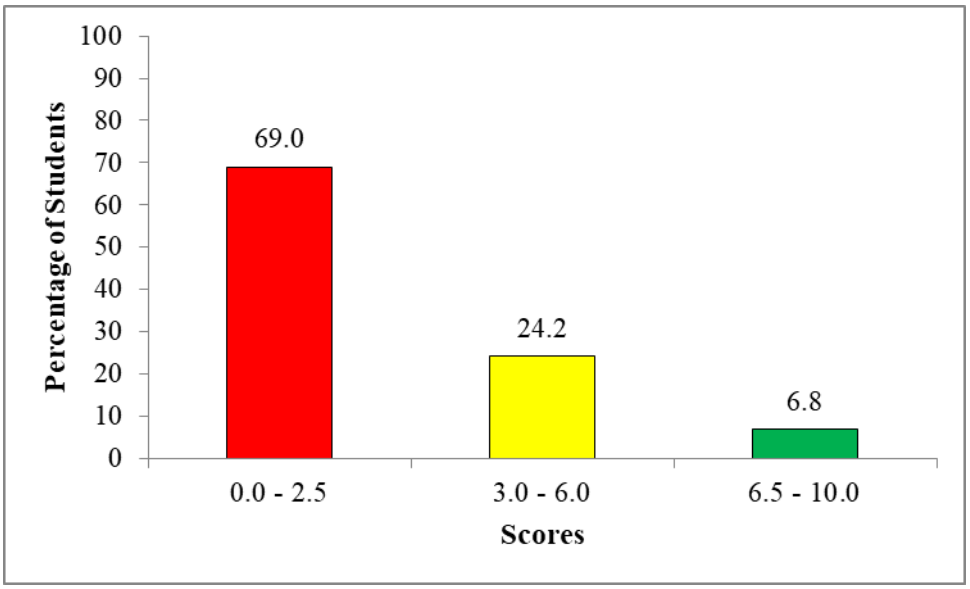


Figure 8: *Distribution of the students' scores on Question 8*

As shown in Figure 8, the analysis shows that 31 per cent of the students scored from 3.0 to 10 marks, whereas 69.0 per cent from 0.0 to 2.5 marks. The general performance of the students in the question was average.

Data portrays that 6.8 per cent of the students had good performance on the question. Analysis of their responses shows that they responded correctly in nearly all parts of the question. In part (a), they managed to give reasons to justify the need for a farm manager to consider records in farming activities. Examples of correct responses provided by the students were; *it helps in farming and budgeting, it determines the financial status of the farmer, evaluate the performance of any farm, enable farmer to get loan from different financial institutions and it provides a history of what has been happening in the farm*. Likewise, the students did well in part (b) by

preparing the balance sheet of Mr. Kiboko's farm as at 30th March, 2021. In so doing, they correctly followed the steps concerned. For example, preparation of the layout, entering of the entries, balancing and calculation of net profit as follows.

MR. KIBOKO'S FARM BALANCE SHEET AS AT 30TH MARCH, 2021					
LIABILITIES			ASSETS		
PARTICULARS	SHS	CTS	PARTICULARS	SHS	CTS
Current Liabilities			Current assets		
Debts to pay	12,000	00	Cash in hand	20,000	00
Wages	20,000	00	Cash in bank	50,000	00
			Debts receivable	10,000	00
			Livestock feeds	10,000	00
Long term liabilities			Fixed assets		
Loan (CRDB)	120,000	00	Farm produce	40,000	00
Total liabilities	152,000		Sprayer	5,000	00
			Livestock	160,000	00
Net profit	223,000		Buildings	80,000	00
Total	**375,000**	**00**		**375,000**	**00**

This signifies that the students had good understanding of the importance of farm records and preparation of the balance sheet. Extract 6.1 represents a sample of responses from a student who performed well on the question.

8. (a) Farm record is an important component for any successful business. Give five reasons which justify a need for a farm manager to consider records in farming activities.

(i) It provide history of what has ben happen on the farm

(ii) It help inform budgetting and planning

(iii) It help to provide financial status of the farm

(iv) It help the farmer to avoid over taxation

(v) It help to provide basis for Comparison

(b) When valuation was done at Mr. Kiboko's farm on 30th March 2021, the situation was as follows:
Cash in hand Tshs 20,000/=; Cash in bank Tshs 50,000/=; Dept payable Tshs 12,000/=; Wages Tshs 20,000/=; CRDB-Bank loan Tshs 120,000/=; Buildings value Tshs 80,000/=; Livestock worth Tsh 160,000/=; Dept receivable Tshs 10,000/=; Knapsack sprayer worth Tshs 5,000/=; Livestock feeds worth Tshs 10,000/= and farm produce worth Tshs 40,000/=. Prepare a balance sheet to show the financial position of Mr. Kiboko's farm as at 30th March 2021.

VALUATION AT MR. KIBOKO'S FARM
BALANCE SHEET AS AT 30th MARCH 2021

Liabilities			Assetts		
Current liability			Current Assets.		
	Tsh	ct		Tsh	ct
Dept payable	12,000	00	Cash in hand	20,000	00
Wages	20000	00	Cash in bank	50,000	00
CRDB Bank loan	120,000	00	Building	80,000	00
			Livestock worth	160,000	00
			Dept receivable	10,000	00
			Knapsack sprayer	5,000	00
			Livestock feeds	10,000	00
			Farm produce	40,000	00
Total liabilities	152000	00	Total Assets	375000	00
Total Liabilities	152000				
Net worth	223000	00			
TOTAL ASSETS	375000	00	TOTAL ASSETS	375000	00

Extract 6.1: A *sample of the student's correct responses to Question 8*

Extract 6.1 represents responses from a student who responded correctly in all parts of the question. The student provided correct benefits of keeping farm records in farming business. Furthermore, he/she managed to prepare the balance sheet.

The students who performed averagely constituted 24.2 per cent of those who attempted the question. Majority of them gave correct reasons to justify a need for a farm manager to consider records in farming activities in part (a). On the other hand, the students faced challenges in the preparation of a balance sheet in part (b) particularly on entering the entries into the balance sheet layout. For example, instead of entering CRDB as a creditor in the liabilities side, most of them entered it into assets side. Likewise, this also happened to Debts receivable where it was entered into the liabilities side instead of assets side. All these incorrect entries affected the balance figure and hence the value of net profit.

Nevertheless, 69.0 per cent of the students had weak performance on the question. Majority of them incorrectly attempted both parts of the question. In part (a), they failed to give the importance of keeping farm records by giving incorrect responses such as *in order to know the labour production, it control farm activities, it help to identify the opportunities, it maintain liquidity, and it improve poverty of our country*. Furthermore, in part (b) they were also unable to prepare the required balance sheet. Instead of preparing the layout of a balance sheet they listed the items as if they were preparing an inventory. With this, it became impossible for them to balance the figure in the two sides of the balance sheet. This situation accounts for their failure to calculate the net profit. The incorrect preparation of the balance sheet from one of the students is exemplified as follows:

Example 1.
Livestock worth……160000
CRDB- Bank loan……120000
Buildings value……80000
Cash in bank……50000
Cash in hand……20000
Wages……20000
Debts payable……12000
Debts receivable……10000

Feeds……10000
Farm produce……40000
Knapsack sprayer worth……5000
Total……277000/=
Kiboko's farm as at 30th march, 2021 = 277000/=

This example indicates that the students lacked understanding of the importance of farm records and preparation of a balance sheet. Extract 6.2 represents a sample of responses from the student who performed poorly on the question.

8. (a) Farm record is an important component for any successful business. Give five reasons which justify a need for a farm manager to consider records in farming activities.

(i) Used in food processing

(ii) Used in food preparation

(iii) Used in crops production

(iv) Used in crop cash

(v) Used in crop farming

(b) When valuation was done at Mr. Kiboko's farm on 30th March 2021, the situation was as follows:
Cash in hand Tshs 20,000/=; Cash in bank Tshs 50,000/=; Dept payable Tshs 12,000/=; Wages Tshs 20,000/=; CRDB-Bank loan Tshs 120,000/=; Buildings value Tshs 80,000/=; Livestock worth Tsh 160,000/=; Dept receivable Tshs 10,000/=; Knapsack sprayer worth Tshs 5,000/=; Livestock feeds worth Tshs 10,000/= and farm produce worth Tshs 40,000/=. Prepare a balance sheet to show the financial position of Mr. Kiboko's farm as at 30th March 2021.

Soln

Cash in hand Tshs 20,000
Cash in bank Tshs 50,000
Dept payable Tshs 12,000
Wages Tshs 20,000
CRDB-Bank loan Tshs 120,000
Building value Tshs 80,000
Livestock worth Tshs 160,000
Dept receivable Tshs 10,000
Farm produce worth Tshs 40,000
Knapsack sprayer Tshs 5000
livestock feed Tshs 10,000
627 000

∴ tol total = 627,000
∴ Mr Kibokos's farm as total 627,000

Extract 6.2: *A sample of the student's incorrect response to Question 8*

Extract 6.2 shows a sample of responses from a student who failed to attempt all parts of the question correctly. He/she showed inadequate

knowledge on the benefits of farm records and preparation of a balance sheet.

2.2.7 Question 9: Principles of Crop Production

The question comprised parts (a) and (b) carrying 10 marks. The question demanded students to: (a) give four main features of composite crop variety and (b) differentiate composite crop variety and hybrid crop variety based on the following criteria: (i) maturity, (ii) ability to use seeds for more than one season, (iii) yield potential, (iv) adaptability to local environment, (v) availability in the market and (vi) uniformity in plant growth. The question tested the students' knowledge and skills on crop varieties.

The question was attempted by 23,886 (100%) students of whom 21,090 (88.3%) scored from 0.0 to 2.5 marks; 2,399 (10%) from 3.0 to 6.0 marks and 397 (1.7%) from 6.5 to 10 marks. Figure 9 indicates the students' scores on the question.

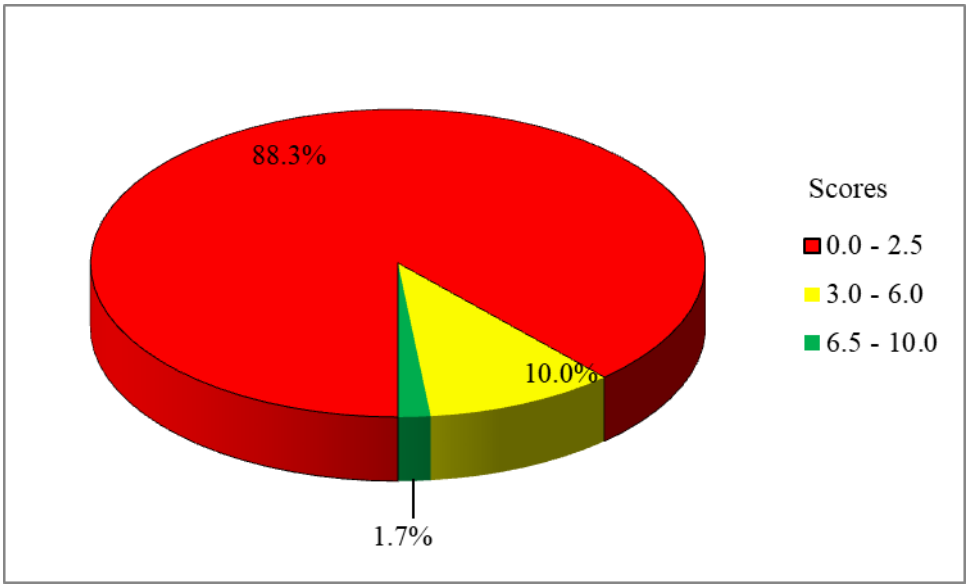


Figure 9: *Distribution of the students' scores on Question 9*

Figure 9 summarises the students' scores, whereby 88.3 per cent scored from 0.0 to 2.5 marks and 11.7 per cent from 3.0 to 10 marks. The performance of the students on the question was weak.

It was observed in the analysis that 88.3 per cent of the students had weak performance on the question. Provision of incorrect responses in most parts of the question accounted for such performance. In part (a), the students failed to give features of composite crop variety. Some of the incorrect responses provided were: *it has strong crops, it grows well in clay soil, it is cheap, it can be harvested by using machines, it takes small area of land, have ability to reproduce by sexual and asexual method and have ability to produce seed*. Some of them mentioned examples of composite seed varieties of maize like *Katumani, Kito, Kilima* and *Ukiriguru* instead of features of composite crop variety. The intended features are genotypic components of composite crop varieties which are open pollinated, they are highly adapted to environmental changes, heterosis is exploited partially in composite crop varieties, it is relevant to cross pollinated species, they are maintained by open pollination and they can be used for more than one season.

In addition, the students incorrectly differentiated composite crop variety and hybrid crop variety based on the named criteria. For example, incorrect responses from one of the students were; (i) Maturity - *Hybrid have has high maturity, it dry when mature and it mature after six months while composite have low maturity* (ii) Ability to use seeds for more than one season - *Hybrid has high yield potential, it requires low rainfall, uniformity in plant growth, it produce many seeds and it decrease soil fertility of the farm while composite has low yield potential* (iii)Yield potential - *Hybrid have average yield potential, it can be harvested by cutting and there is high seed dormancy while composite have high yield potential* (iv) Adaptability to local environment - *Hybrid it require high temperature, it cannot be easily destroyed, it required good environment and farm should be surrounded by fence while composite require low temperature* (v) Availability in the market - Hybrid have high cost *while composite have low cost* (vi) Uniformity in the plant growth- *Hybrid it does not uniformity in the plant growth while composite it is uniformity.* These responses show the students were not competent on crop varieties and their distinguishing characteristics. One could distinguish the two as follows: (i) Maturity: Hybrid varieties grow and mature faster than composite varieties (ii) Ability to use seeds for more than one season: Hybrid seeds cannot be used for more than one season while composite varieties can be used from 3 to 4 seasons before replacement (iii) Yield potential: Hybrid varieties produce

more yield than composite varieties, (iv) Adaptability to local environment: Composite varieties are more adaptable to local environment than hybrid varieties, (v) Availability in the markets: Hybrid varieties are more available in the markets than composite varieties and (vi) Uniformity in plant growth: Hybrid varieties produce more uniform growth than composite varieties. Extract 7.1 is an example of incorrect responses from the student who performed weakly.

9. (a) Composite crop varieties are one of the common types of Maize seed adopted by many farmers in Tanzania. What are the four main features of the varieties?

(i) field Operation records.

(ii) Inventory records.

(iii) production records

(iv) farm Map:

(b) Hybrid seeds of various crops are currently in use by many farmers due to their higher yielding potential than composite varieties. Differentiate the two crop varieties based on the following criteria:

(i) Maturity
farm manager whether produce maize or not varies

(ii) Ability to use seeds for more than one season
Method of planting would you recommend to be Used by farmer who has brought:

(iii) Yield potential
In a group One your co'league asked about the percentage of Mineral

(iv) Adaptability to local environment
Most farmers are Unaware of the importance of the packing pattern of the soil particles

(v) Availability in the market
Are record that shows comparisons of prices of particular products at different markets

(vi) Uniformity in plant growth
Are record that shows various practices like planting Weeding and harvesting.

Extract 7.1: *A sample of the student's incorrect responses to Question 9*

Extract 7.1 indicates a response by a student who lacked knowledge of crop varieties. The student failed to provide correct responses in all parts of the question.

Data indicated 10 per cent of the students to have performed averagely in the question. Majority provided partial correct responses in both parts of the question. For example, it was noted that most of them mixed the differences between composite and hybrid crop varieties with regard to maturity, yield potential and adaptability to local environmental in part (b). This suggests that the students had partial knowledge of crop varieties.

However, 1.7 per cent of the students performed well on the question. Majority gave correct features of composite crop variety and correctly differentiated composite and hybrid crop varieties in part (a) and (b) respectively. This indicates that the students were knowledgeable about crop varieties and their distinguishing characteristics. Extract 7.2 illustrates an example of correct responses from a student with good performance.

9. (a) Composite crop varieties are one of the common types of Maize seed adopted by many farmers in Tanzania. What are the four main features of the varieties?

(i) Component genotypes are open pollinated

(ii) Composite varieties are relevant to cross-pollinated varieties

(iii) Composite varieties they are adaptable to the environment changes

(iv) Composite varieties can be served for next planting season and they exploit heterosis partially

(b) Hybrid seeds of various crops are currently in use by many farmers due to their higher yielding potential than composite varieties. Differentiate the two crop varieties based on the following criteria:

(i) Maturity

The hybrids varieties they reach maturity very fast and produce fruits WHILE Composite variety they reach maturity very slow and long period of time without even bearing fruits.

(ii) Ability to use seeds for more than one season

Composite varieties can be served for the next planting seasons WHILE the hybrids varieties can not be served for the next planting seasons since they die fail to grow

(iii) Yield potential

Hybrids seeds varieties produce the high yields of crops and varieties are of high yield quality WHILE Composite varieties the produce the crops or fruits of low yields quality

(iv) Adaptability to local environment

Composite varieties they are highly adaptable to the local environment WHILE the hybrids they are not highly adaptable to the local environment

(v) Availability in the market

Hybrids seeds varieties they are highly available in the market and have high demand WHILE Composite varieties are not available in the market highly and they are not demanded since they have low quality

(vi) Uniformity in plant growth

Hybrid varieties they grow with the uniformity in depth size and characteristics WHILE The composite varieties they grow with the varying depth, and size of the crops in the field.

Extract 7.2: *A sample of the student's correct responses to Question 9*

Extract 7.2 exemplifies responses from a student who performed well in all parts of the question. The student possessed adequate knowledge of the subject matter.

2.3 SECTION C: ESSAY QUESTION

2.3.1 Question 10: Introduction to Soil Science

The question carried a total of 15 marks. The students were required to explain by giving two points on each, how the following soil physical properties affect soil crop productivity (i) soil texture (ii) soil structure and (iii) soil porosity. Categorically the question tested the students' knowledge and understanding of the concept of soil physical properties and its relationship with soil crop productivity.

The question was attempted by 23,886 (100%) students whereby 22,690 (95.0%) scored from 0.0 to 4.0 marks; 1,018 (4.3%) from 4.5 to 9.5 marks and 178 (0.7%) from 10 to 15 marks. Figure 10 shows the distribution of students' scores on the question.

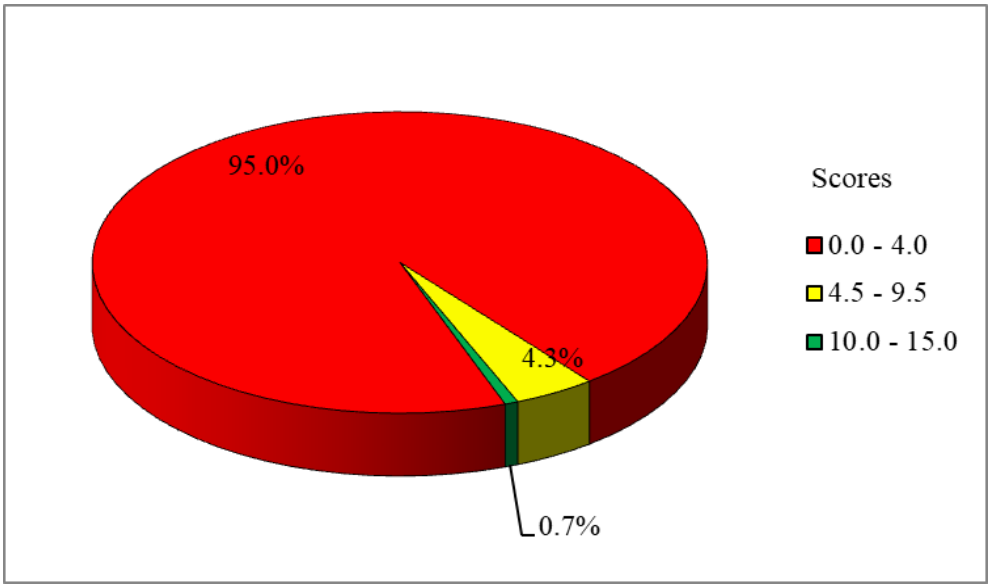


Figure 10: *Distribution of the students' scores on Question 10*

Figure 10 indicates that the majority of the students (95 %) scored from 0.0 to 4.0 marks and a few, (5 %) from 4.5 to 15 marks. Thus, the general performance of the students on the question was weak.

Analysis indicated that, majority of the students (95%) had weak performance. The students failed to explain the influence of soil texture, soil structure and soil porosity on soil crop productivity. Some of the students gave the classification of soil particles according to their diameter as the influence of soil texture on soil crop productivity. Other incorrect responses provided for the influence of soil texture were *it causes death to the plants, it decreases production, it causes weather hazards, it controls soil erosion, it causes the soil to drain very slowly, it causes pests and diseases and it reduce nutrient to the soil*. With regard to the influence of soil structure on soil crop productivity, some students mentioned types of soil structure. Others came up with incorrect responses such as *it suppress the weeds, it helps to control pests and diseases, produce more than one crop, it causes degradation, it increases temperature to the soil and it reduce soil moisture.* Examples of incorrect responses given for the influence of soil porosity on soil crop productivity were *it helps farmer to produce high yield, it leads to accumulation of salt in the soil, it influences absorption of nutrients, it increases the weight of the soil and it cause global warming.*

Moreover, besides showing poor understanding of the influence of the named soil physical properties on soil crop productivity most of the students demonstrated poor essay writing skills. They failed to organise the essays into introduction, main body and conclusion parts. The students also demonstrated poor command of English language whereby they failed to explain their responses in detail as per the demand of the question type. Extract 8.1 illustrate a sample of incorrect responses to the question.

10. In a village meeting, an extension officer relate decrease in crop productivity with the poor physical properties of the soil. How does each of the following soil properties affect soil crop productivity? Give two points for each.
(i) Soil texture
(ii) Soil structure
(iii) Soil porosity

crop - Ic the crop for farming the farmer when the soil In texture In the farm when giving soil texture the following are the soil of Tanzania and the disadvantage.

soil texture, This when occur the soil when the point about the soil texture to crop when the following after the crop If the soil texture the advantage of soil texture when going directly the soil texture If you go when going soil texture. While the soil texture when the going directly If the soil crop the texture When if the soil texture of Tanzania If soil.

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All In ALL, The soil of Tanzania when going directly the advantage and disadvantage In Tanzania when going directly In Tanzania If you know want Tanzania are The disadvantage In Tanzania when going directly If The agriculture In Tanzania.

Extract 8.1: *A sample of the student's incorrect responses to Question 10*

Extract 8.1 justifies a student's poor understanding of the physical properties of the soil. The student responded incorrectly in all parts of the question using poor English language.

According to the statistics, 4.3 per cent of the students performed averagely on the question. Most of them organized their essays correctly but provided partial correct responses concerning the influence of soil texture, soil structure and soil porosity on soil crop productivity. This is an evidance that they possessed partial knowledge on the subject matter.

In contrast, the students who had good performance on the question constituted 0.7 per cent. Majority of them were able to explain the influence of soil texture, soil structure and soil porosity on soil crop productivity. Examples of such correct responses were; (i) Soil texture it is important in influencing root penetration and growth, it also influence water holding capacity of the soil, soil fertility is influenced by soil texture, it allows air circulation in the soil (ii) Soil structure it allows more air to circulate in the soil. It influences seed emergence and root penetration. It also influences water holding capacity. It influences availability of plant nutrients and (iii) Soil porosity influences seed germination and general plant growth. Porosity provides a room for microbial activities in the soil which leads into release of nutrients for plant growth and it influences organic matter decomposition for release of nutrients for plant growth. This shows that the students had knowledge of the influence of soil physical properties on crop production. In addition, the students organized their essays well hence scored high marks. Extract 8.2: illustrates a sample of correct responses on the question

10. In a village meeting, an extension officer relate decrease in crop productivity with the poor physical properties of the soil. How does each of the following soil properties affect soil crop productivity? Give two points for each.
    (i) Soil texture
    (ii) Soil structure
    (iii) Soil porosity

Crop productivity is the ability of the Land to sustain the production of the crops. The production of the Land Crops due to the Land is influenced by the Soil which it has Physical properties Such as Soil texture, Soil structure and Soil porosity which influence the Crop productivity. The following are ways how the Soil texture affect the Soil Crop productivity

Soil texture influences the water holding Capacity of the Soil Which influence Affects the Soil Crop productivity; the Soil texture always determine the water holding Capacity hence determines the crop to be grown Forexample Clay Soil has high Water holding Capacity due to Small diameter of Soil particles hence Support the growth of hydrophytes Such as the Paddy

Soil texture influences the Plant root penetration which Can also affect the Soil Crop productivity, This influences goes in line With the roots to plants Which roots which go deeper need the Soil With texture of large diameters While Which go shallower need only With Small diameter example the Cassava should be planted In the Sand So as to penetrate deep hence Increased Product than planting In Clay Soil.

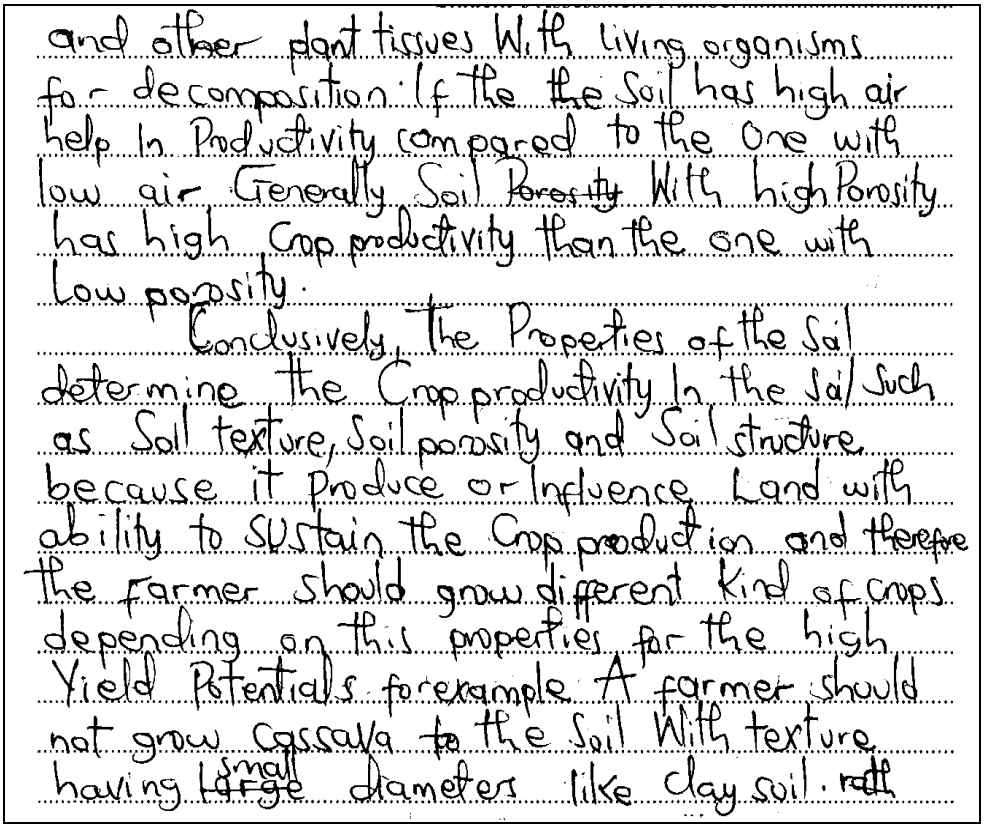
Secondly, also Soil structures affect the Soil Crop productivity and the following are the ways how the Soil structure affect the Soil Crop productivity

The Soil structure has available air spaces which allow Supply of air In the Soil; The air Supplied in the Soil it Affects the Crop productivity because the air is used for the germination forexamo and Platy and blocky structures Should not be used because they don't give high Supply of air In the Soil

The Soil structure facilitate the drainage of Soil hence affects the Soil Crop productivity, The Compactness into aggregates in to the Soil Particles Influence high removal of Water and low removal water forexample the granular and Crumby structures of the Soil Influence high drinage Compared to other structures. Lastly, The Soil porosity lead to the affecting of the Soil Crop productivity and the following are Ways how the Soil porosity Affect the Crop productivity In the Soil.

Soil porosity hence facilitate the Plant occupying of the Water In the Soil; the Volume of water is occupied in soil through the Property of Soil porosity. The Soil Solids occupy the Water hence help In the germination of the Crops. The

Soil porosity facilitate the Occupying of the air In the Soil; The Soil porosity Involve the percentage of the Soil Which lead to growing of the Plant and Survival of the not


and other plant tissues With living organisms for decomposition. If the the Soil has high air help In Productivity compared to the One with low air. Generally Soil Porosity With high Porosity has high Crop productivity than the one with low porosity.

Conclusively, The Propeties of the Soil determine the Crop productivity In the Soil such as Soil texture, Soil porosity and Soil structure because it Produce or Influence Land with ability to SUStain the Crop production and therefore the farmer should grow different kind of crops depending on this properties for the high Yield Potentials forexample A farmer should not grow Cassava to the Soil With texture having ~~Large~~ small diameters like clay soil. ~~rath~~

Extract 8.2: *A sample of the student's correct responses to Question 10.*

Extract 8.2 shows an example of responses from a student who had adequate knowledge of physical properties of soil. He/she responded correctly in all parts of the question.

3.0 THE ANALYSIS OF STUDENTS' PERFORMANCE IN EACH TOPIC IN AGRICULTURE SUBJECT FTNA 2022

This section presents the analysis of students' performance in each topic assessed. The data were analysed based on the percentage of the students who scored an average of 30 marks and above in each topic. When the percentage ranges between 0-29, the performance is considered as weak; 30-64 average and 65-100 good.

All nine (9) topics in the 2019 Agriculture syllabus were assessed in 2022. The performance of the students in the topics is presented hereafter: The students had good performance in multiple choice items (84.20%) which covered the topics namely *Introduction to Agriculture*, *Principles of Crop Production*, *Introduction to Livestock Production*, *Introduction to Soil Science*, *Basics of Farm Management*, *Factors of Production*, *Introduction to Crop Production* and *Crop husbandry*.

Students performed averagely in the topics namely *Basics of Farm Management* (50.20%), *Introduction to Livestock Production* (39.40%) and *Introduction to Crop Production* (31.20%). However, they had weak performance in the topics of *Mechanisation in Agriculture* (24.20%), *Introduction to Soil Science* (23.25%) and *Principles of Crop Production* (12.70%). The analysis is summarised in Appendix I.

Weak performance of the students in the topics is attributed to several factors including inadequate knowledge and skills of the subject matter, misconceptions and poor English language proficiency as stipulated in the analysis of students' performance on each question.

Comparing to students' performance in 2021, the students maintained good performance in multiple-choice items and average performance in the topic Introduction to Crop Production. The performance in topics of Introduction to Soil Science and Principles of Crop Production remained weak. Furthermore, performance in the topic of Mechanisation in Agriculture has dropped from average in 2021 to weak in 2022.

4.0 CONCLUSION AND RECOMMENDATIONS

This section contains an overview of the analysis and suggestions to improve students' performance in future assessments.

4.1 Conclusion

The analysis of students' responses indicated that students' performance in the 2022 assessment is generally average with some students scoring low and others high marks. Scoring of low marks is largely attributed to inadequate mastery of subject matter, misunderstanding of the key concepts, and lack of proficiency in English language. Provision of responses which are note related to the questions asked and failure to attempt some of the questions is an indication of poor mastery of the subject matter.

Misunderstanding of the questions and failure to address the action verbs in the questions demonstrate failure to meet the demands of the questions hence scoring low marks. For example, in some cases the students were demanded to give explanation but instead, the students just listed.

On language and writing skills, most of the students demonstrated poor command of the English language. They could not make clear and understandable descriptions and elaborations. Most of the sentences they constructed were difficult to understand. Some students failed to even properly organize the essays following the three generic sections namely introduction, main body and conclusion.

A close look on few students who had good performance in the questions revealed that they had good understanding of the subject matter, good English language command and good writing skills.

4.2 Recommendations

Performance of the students in future assessments can be improved by the following ways:

(a) Teaching and learning processes should be improved to enable students' mastery of subject matter. The use of different teaching and learning strategies should be encouraged and its choice should base on the requirements of specific topic and competence targeted. For example, the school can invite an extension officer as a guest speaker to explain the concepts of planting time and early planting on the Principles of Crop Production topic.

(b) Teachers should be encouraged and enabled to use student centered pedagogy approach to enable students engage actively in the learning process, hence develop the required competences. For example, students can determine the bulk density of soils on the topic of Introduction of Soil Science using real soil samples in the laboratory.

(c) Teachers should orient students to common terms used to ask questions as far as Blooms' is concerned and how to respond to them. Such term include; account for, justify, analyze, give, identify, etc. In addition, students should be taught essay writing and organizational skills.

(d) Students should improve their command of the English language by deliberately immersing into the language through listening, speaking reading and writing. For example, listening to English programmes on the radio and TV, Speaking through participating in debates and morning talks and reading books, newspaper and magazines.

(e) Teachers are encouraged to use the agriculture feedback report provided on Students Item Response Analysis and share with students during teaching and learning process so that they can improve their understanding of the subject matter.

Appendix: Students Performance per topic in FTNA 2022

SN	Topic	Question Number	Percentage of the Students who scored the average of 30% and above	Comments
1.	Introduction to Agriculture, Principles of Crop Production, Introduction to Livestock Production, Introduction to Soil Science, Basics of Farm Management, Factors of Production Introduction to Crop Production and Crop husbandry	1	84.20	Good
2.	Basics of Farm Management	2,8	50.20	Average
3.	Introduction to Livestock Production	3	39.40	Average
4.	Introduction to Crop Production	7	31.20	Average
5.	Mechanisation in Agriculture	5	24.20	Weak
6.	Introduction to Soil Science	4,10	23.25	Weak
7.	Principles of Crop Production	6,9	12.70	Weak