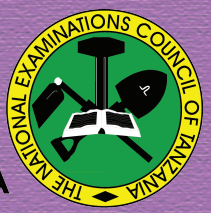
THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA



CANDIDATES' ITEMS RESPONSE ANALYSIS REPORT ON THE ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION (ACSEE) 2025

AGRICULTURE

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134 AGRICULTURE

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FOREWORD

This report presents the Candidates' Items Response Analysis (CIRA) for the Advanced Certificate of Secondary Education Examination (ACSEE) administered in May 2025. The ACSEE serves as a summative assessment designed to identify candidates who are ready to progress to middle and higher learning institutions.

This report aims to provide valuable feedback to education stakeholders, including teachers, students, parents, curriculum developers, policymakers, and other partners, by highlighting the strengths and weaknesses demonstrated by candidates in responding to the Agriculture examination questions.

The findings of this analysis reveal that a total of 1,102 candidates were registered for the ACSEE Agriculture examination in 2025, of whom 1,094 sat for the examination. The performance statistics show that all candidates (100%) passed, reflecting an overall good performance. However, despite the general pass, the majority of candidates clustered around the lower pass grades, largely due to misconceptions, inadequate understanding of key concepts, and insufficient practical skills. Conversely, those who attained higher pass marks demonstrated a strong grasp of concepts and well-developed practical skills.

The National Examinations Council of Tanzania (NECTA) trusts that this feedback will shed light on the prevailing challenges and inform targeted interventions to improve teaching and learning processes in the Agriculture subject. We hope that this report will stimulate constructive dialogue and actions among education stakeholders to ensure that future candidates are better equipped with the necessary knowledge and practical skills to excel.

NECTA would like to express its sincere gratitude to everyone who contributed to the preparation of this report.

Prof. Said Ally Mohamed
EXECUTIVE SECRETARY

1.0 INTRODUCTION

This report presents an analysis of candidates' performance in the Agriculture subject for the Advanced Certificate of Secondary Education Examination (ACSEE) conducted in 2025. The examination was set according to the 2019 Agriculture examination format, based on the 2009 Agriculture syllabus. The Agriculture examination consisted of three papers: 134/1 Agriculture 1 (theory), 134/2 Agriculture 2 (theory), and 134/3 Agriculture 3 (practical).

Papers 1 and 2 each contained ten short-answer questions, with each question carrying 10 marks, making a total of 100 marks per paper. Paper 3 included three short-answer questions: Question 1 carried 20 marks, while Questions 2 and 3 carried 15 marks each, resulting in a total of 50 marks for the practical paper. Candidates were required to answer all questions in each of the three examination papers.

A total of 1,102 candidates were registered to sit for the ACSEE Agriculture examination in 2025. Of these, 1,094 candidates sat for the examination. The performance statistics show that all candidates (100%) passed the examination, indicating overall good performance. The following table summarises a comparison of candidates' performance in 2024 and 2025.

Comparison of Candidates' Performance in ACSEE 2024 and 2025

Year	Grades							% Pass	% Fail	Sat
	A	B	C	D	E	S	F			
2024	0	56	343	396	66	3	0	100	0	866
2025	0	10	240	630	206	8	0	100	0	1,094

Source: NECTA Statistics Book, pg. 6 ACSEE, 2025

As shown in Table 1, in both years (2024 and 2025), most candidates obtained lower passing grades (D, E, and S). Notably, in 2025, the percentage of candidates who attained higher passing grades (A, B, and C) decreased from 46.07% in 2024 to 22.85% in 2025.

The grading system comprises seven grades: A, B, C, D, E, S, and F, with the following score intervals and remarks: A (80–100): Excellent, B (70–79): Very Good, C (60–69): Good, D (50–59): Average, E (40–49): Satisfactory, S (35–39): Subsidiary, and F (0–34): Fail.

The remainder of this report is structured into three key sections: analysis of candidates' performance in each question, analysis of candidates' performance in each topic, and conclusion and recommendations for improving future performance.

2.0 THE ANALYSIS OF THE CANDIDATES' PERFORMANCE IN EACH QUESTION

This section presents an analysis of candidates' performance in each question. The analysis highlights the requirements of each question, the overall performance of the candidates, their responses, and possible reasons for their performance. In addition, sample extracts are provided to illustrate both correct and incorrect responses given by candidates. Graphics are also used to illustrate specific cases of performance trends. In this analysis, performance is categorized as weak, average, or good, depending on the percentage of candidates who scored an average of 35 per cent and above: 0–34% is considered weak, 35–59% is average, and 60–100% is good. Three colours (green, yellow, and red) are used to indicate good, average, and weak performance, respectively.

2.1 THE ANALYSIS OF THE CANDIDATES' PERFORMANCE IN 134/1 AGRICULTURE 1

2.1.1 Question 1: Workshop Technology and Farm Structures

(a) *Suggest five ways that should be used to maintain power workshop tools and guarantee their usefulness.*

(b) *Briefly explain the functions of each of the following parts of a dip:*
- (i) *Footbath*
- (ii) *The jump*
- (iii) *Drainage race*
- (iv) *Entrance race*
- (v) *Assembly yard*

The question assessed the candidates' understanding of farm structures and the maintenance of farm workshop tools. It was attempted by all 1,094 candidates (100%), of whom 130 (11.88%) scored between 0.0 and 3.0 marks, 359 (32.82%) scored between 3.5 and 5.5 marks, and 605 (55.30%) scored between 6.0 and 10.0 marks. Figure 1 shows the distribution of candidates' scores for this question.

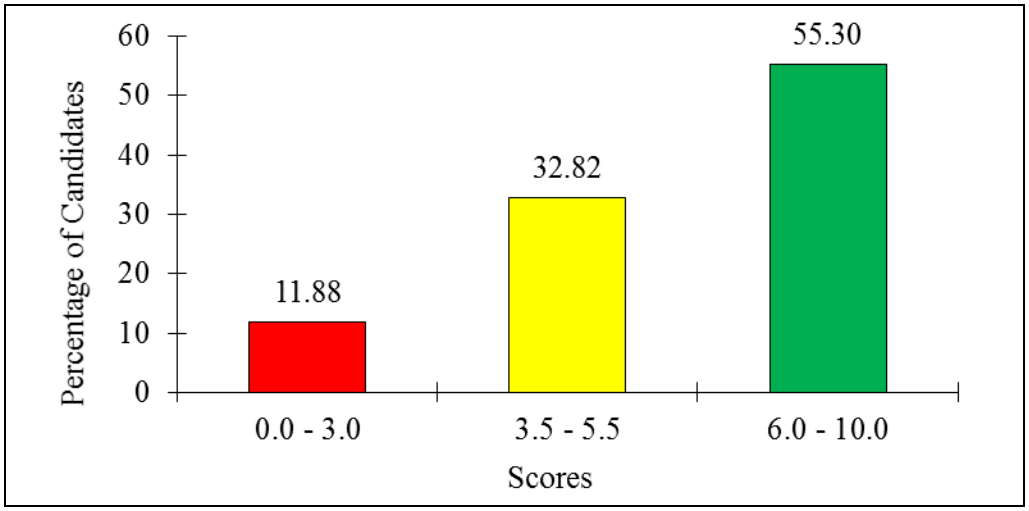


Figure 1: C*andidates' Performance on Question 1*

With respect to Figure 1, most candidates (88.12%) scored between 3.5 and 10.0 marks, while 11.88% scored between 0.0 and 3.0 marks. The overall performance on this question was good.

The data show that 55.30% of the candidates performed well on the question by providing correct responses to almost all parts. In part (a), they correctly suggested ways to maintain power workshop tools and ensure their usefulness. They provided correct responses such as: *correct use of the power tool*, *regular sharpening*, *regular lubrication*, *inspecting tools after use*, *proper storage*, *replacing worn parts*, and *cleaning tools with oil to prevent rusting*. These responses demonstrate a good understanding of power workshop tools maintenance.

Similarly, in part (b), they correctly explained the functions of the named parts of a dip. The correct responses included: the footbath *is used to wash animals' feet before entering the dip tank*; the jump *is a narrow entrance that allows individual animals to jump into the dip*; the drainage race *is an area near the dipping tank designed to return excess dip wash to the tank*; the entrance race *is where animals walk into the dipping tank*; and the assembly yard *is where the animals are gathered before the dipping process*. These responses signify a clear understanding of the parts and functions of a dip. Extract 1.1 shows a sample of the correct responses from one of the candidates.

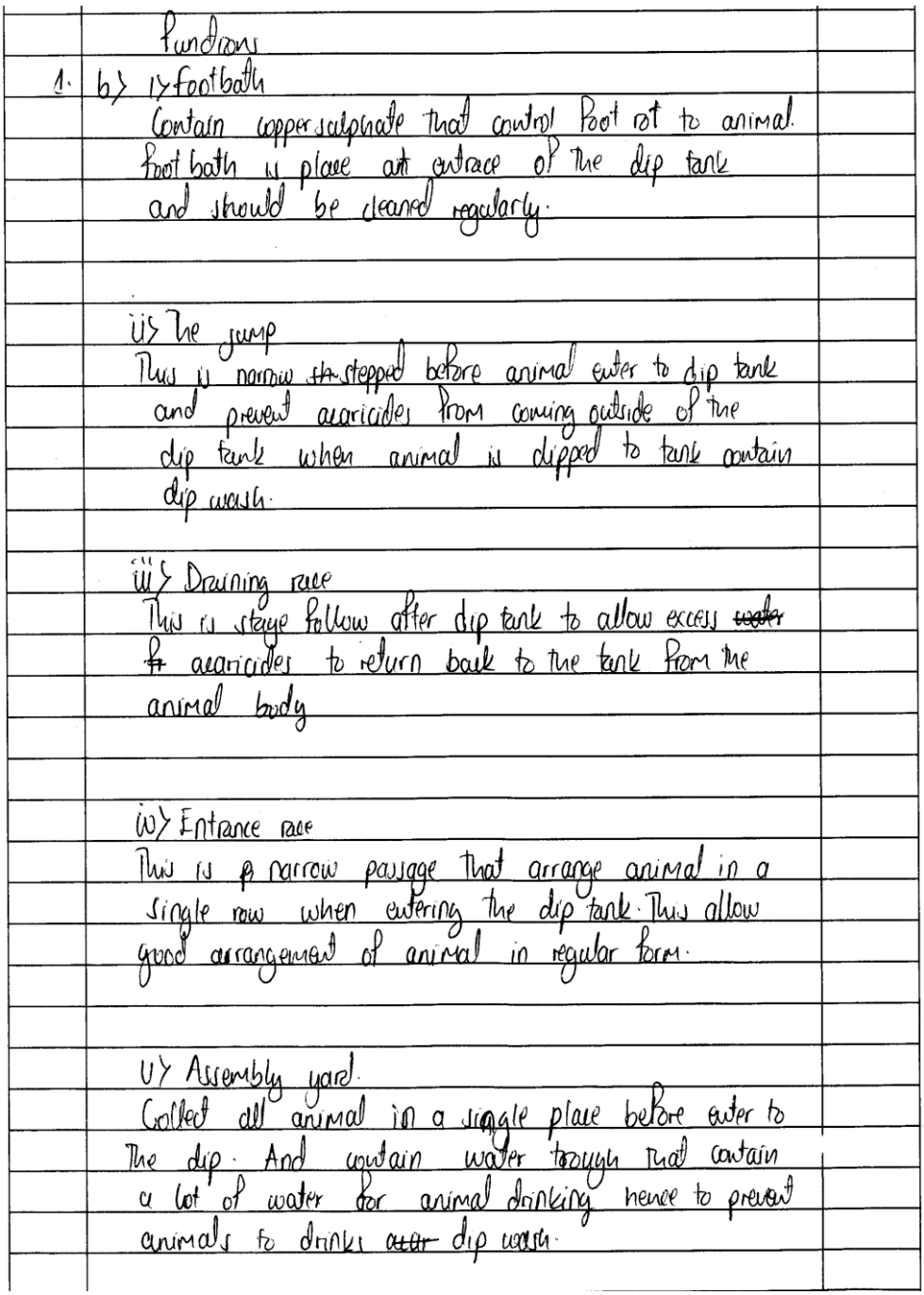
1. a) i) Clean the workshop tools after working hours or when become dirty. To ensure longer lifespan of tools proper cleaning is necessary and drying.

ii) Store workshop tools in dry and cool place. power tools can be damaged when contact with water so to prevent this action it's necessary to preserve the tools in dry and cool place.

iii) ~~Used~~ Use specific power workshop tools for only specific function. Each of power tools should be used to specific function in order to increase it's efficiency.

iv) Sharpening of cutting edges of power tools when become blunt. Also cutting edges of power tools should be well sharpened so as to increase efficiency and reduce driving force on it.

v) Apply oil and greasing all movable parts in power workshop tools. greasing help to reduce noise and friction between movable parts of power tools and hence higher efficiency and longer lifespan


Functions
1. b) i) Footbath
Contain copper sulphate that control foot rot to animal.
Foot bath is place at entrace of the dip tank
and should be cleaned regularly.

ii) The jump
This is narrow stepped before animal enter to dip tank
and prevent acaricides from coming outside of the
dip tank when animal is dipped to tank contain
dip wash.

iii) Draining race
This is steye follow after dip tank to allow excess ~~water~~
of acaricides to return back to the tank from the
animal body

iv) Entrance race
This is a narrow passage that arrange animal in a
single row when entering the dip tank. This allow
good arrangement of animal in regular form.

v) Assembly yard.
Collect all animal in a single place before enter to
the dip. And contain water trough that contain
a lot of water for animal drinking hence to prevent
animals to drinks ~~over~~ dip wash.

Extract 1.1: A sample of the candidates' correct responses to question 1.

Extract 1.1 shows responses from a candidate who demonstrated a good understanding of the subject matter by providing correct responses to both parts of the question.

Moreover, 32.82 per cent of the candidates had an average performance on the question. Most of them managed to suggest the appropriate ways that should be used to maintain power workshop tools and guarantee their usefulness in part (a). However, they failed to explain the functions of the parts of a dip in part (b), indicating a poor understanding of its structure.

On the other hand, 11.88 per cent of the candidates performed poorly on the question. The majority provided incorrect responses to both parts of the question. In part (a), they failed to suggest appropriate ways to maintain power workshop tools and ensure their usefulness; instead, they listed routine maintenance procedures for tractors before starting work. Examples of such incorrect responses included: *check the level of the fuel in the fuel tank, check the water level in the radiator, check the tyre pressure, check the level of electrolyte in the battery and where necessary add it, check the battery charge for better working, check the engine oil by using a dip stick* and *lubricate all the moving parts to prevent friction*. These responses indicate a failure to understand the demands of the question.

Similarly, in part (b), the candidates failed to explain the functions of the parts of a dip. The majority provided various incorrect responses for each part, such as: footbath: *help cattle to stand up when moving to the rough surface during dip, is a place where animals are dipped, used for spraying the foot of the animal during dip*, and *a place where the animal moves*; the jump: *contain mixture of water and dip, used to push the animal to spraying part*, and *is used for treating animals*; drainage race: *help to remove urine and dung, help to remove collected water, help in removal of mixture of dip with water*, and *help to rest the animal*; entrance race: *used to allow water and dip mixture to enter as an inlet part, a place where mixed medical pass during spraying*, and *a place for resting animals*; assembly yard: *a place where the animals collect after dipping, is a place where dipping is done*, and *a place where the animals stay for rest*. These responses indicate a lack of understanding about the farm dip. Extract 1.2 presents a sample of the incorrect responses from one of the candidates.

01 (a) Ways that should be used to maintain power workshop tools

i) Hack saw

- It maintained by when finishing using it put clean and put in safe place in a workshop
- It used on cutting timber for other purpose like building.

ii) Jack plane

- After using it clean and put oil in all rotating part to prevent rust and increasing their efficiency also put in a safe place
- It used on smoothen timber

iii) File

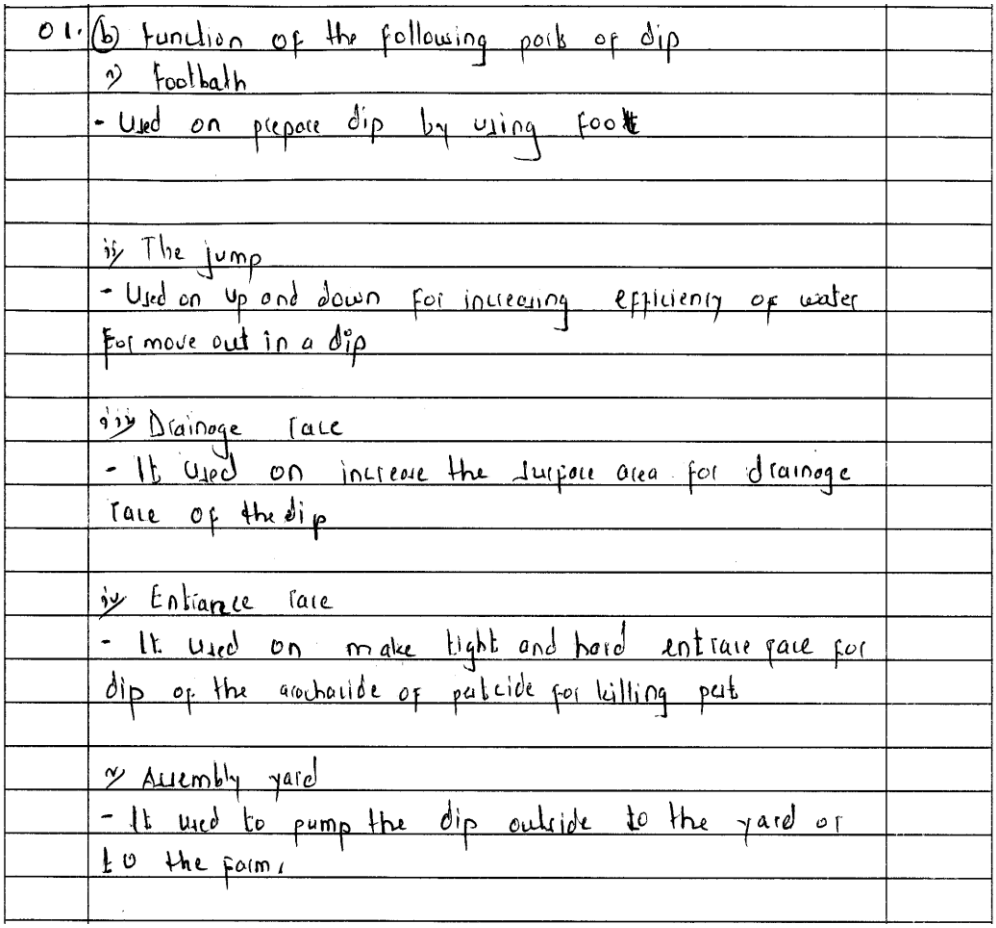
- Clean and put in a dry place for dry it then put in a rank or box of a tool stored different with others for prevent injuries
- It used on cutting metals

iv) Hammer

- Clean after using it put in a test ~~tube~~ box rank for safe to the people who work in workshop
- It used on remove and enter nail in the timber

v) Watering can

- ~~the~~ Washing with soup and clean water, then reap clean with water, dry it in the sun then store well in the work-shop
- It used on dip water in the garden



Extract 1.2: A sample of the candidates' incorrect responses to question 1.

Extract 1.2 indicates responses from a candidate who attempted incorrectly both parts of the question. The candidate provided various incorrect responses, implying a lack of subject matter knowledge.

2.1.2 Question 2: Farm Power

(a) *Briefly describe five components of a tractor fuel system.*

(b) *Briefly explain how two different types of air cleaners work so as to ensure proper ignition*

The question examined candidates' knowledge and skills of tractor engines systems. It was attempted by all 1,094 candidates (100%), of whom 735 (67.18%) scored between 0.0 and 3.0 marks, 264 (24.14%) scored between 3.5

and 5.5 marks, and 95 (8.68%) scored between 6.0 and 9.5 marks. Figure 2 shows the distribution of the candidates' scores for this question.

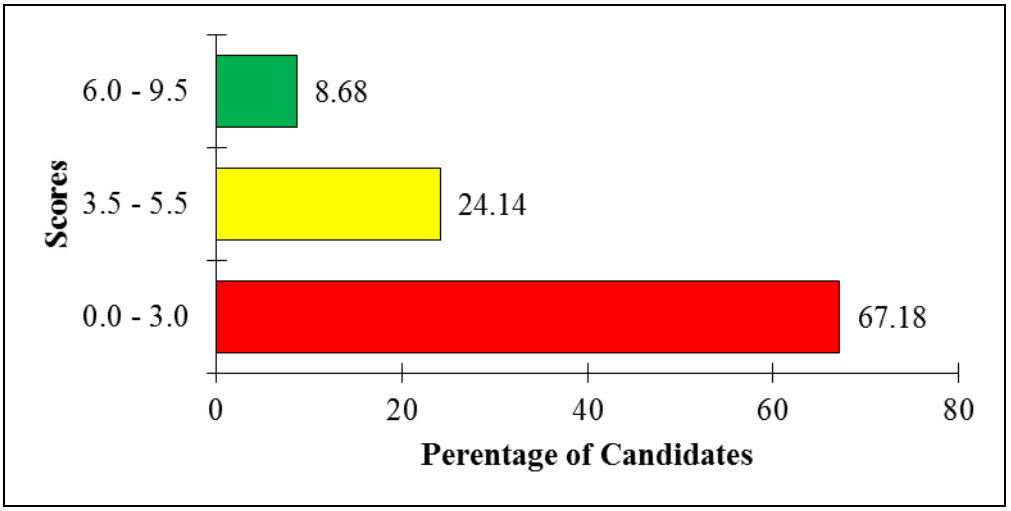


Figure 2: C*andidates' Performance on Question 2*

Figure 2 indicate that, 32.82 per cent of the candidates scored between 3.5 and 9.5 marks, while 67.18 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was weak.

The statistics indicate that 67.18 per cent of the candidates performed poorly on the question. Most of them responded incorrectly to both parts. In part (a), they were unable to describe the components of a tractor fuel system. The majority explained parts of the engine that are not related to the fuel system, such as the *clutch*, *gearbox*, *differential*, *final drive*, *crankshaft*, *pistons*, *camshaft*, *crankcase*, and *engine block*. These responses demonstrate a lack of understanding of the tractor fuel system. Likewise, in part (b), the candidates provided a variety of incorrect responses regarding how two types of air cleaners work, mentioning items like *water air cleaner*, *spark plug*, *water bath cleaner*, and *differential bath cleaner*. These responses indicate that the candidates were not familiar with the type of air cleaner used in tractor. Extract 2.1 presents a sample of incorrect responses from one of the candidates.

02: g) The following are the component of a tractor fuel system:

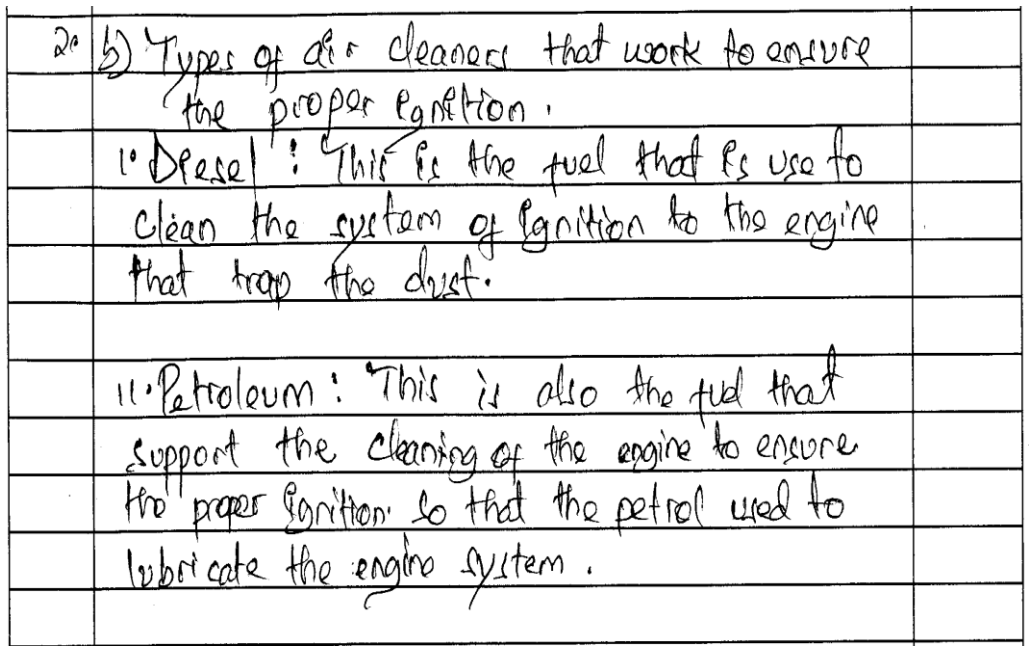
i. Cooling system: This is the system that is used to the tractor fuel system in order to reduce the overheat of the engine.

ii. Ignition system: Also this is the system that is divided into two sides that are spark ignition system and compression system that used to the tractor engine to operate the tractor.

iii. Hydraulic system: This is the among of the componend that support the tractor fuel system, the hydraulic can help on the fuel system of the engine

iv. Electric system: This is the component of the tractor fuel system that help the fuel to take place and be transmitted to the engine parts then allow the operation to the tractor.

v. Lubrication system: The lubrication this consider the use of lubricant to the tractor engine that are fuel as diesel. The lubrication system help on preventing the jonction of the engine parts.



Extract 2.1: A sample of the candidates' incorrect responses to question 2.

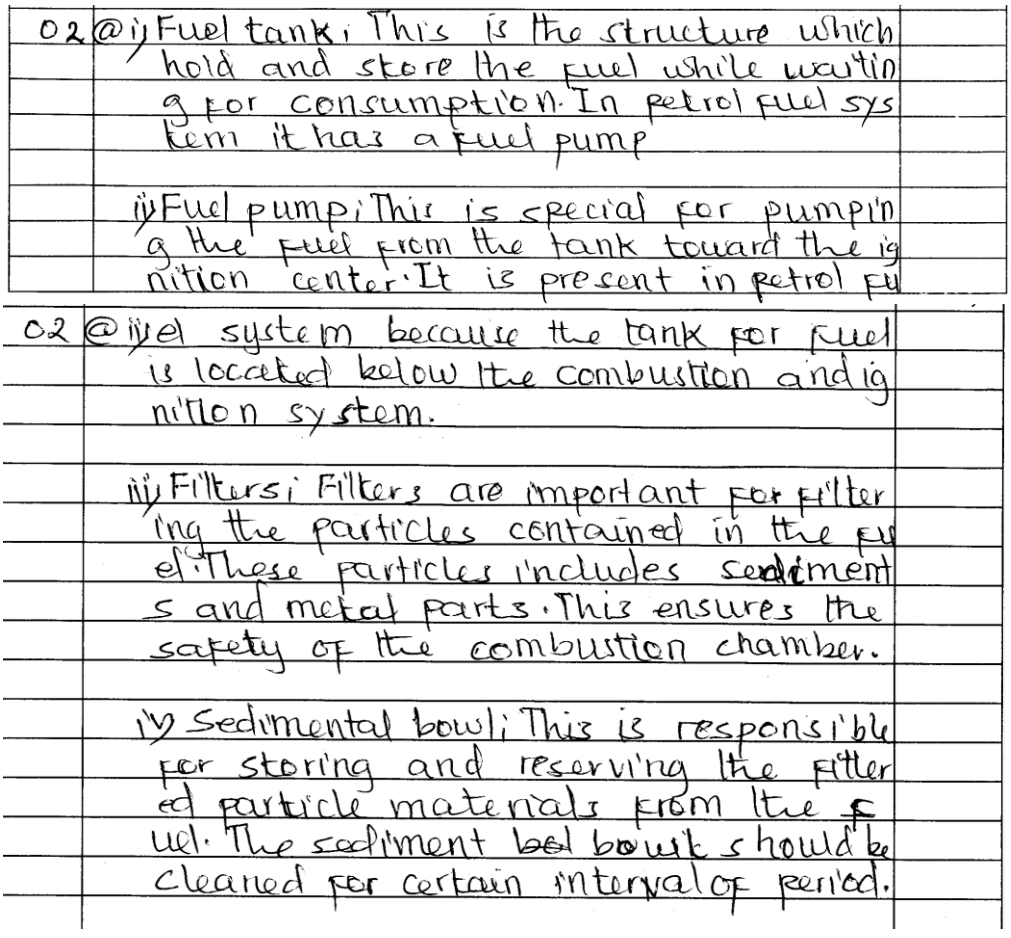
Extract 2.1 presents responses from a candidate who provided incorrect responses to the entire question. In part (a), the candidate attempted to explain different tractor engine systems instead of the components of the fuel system, and explained the types of fuel instead of how air cleaners work in part (b).

Additionally, 24.14 per cent of the candidates had an average performance on the question. Most of them correctly described the components of the fuel system in a tractor in part (a), but failed to explain how air cleaners work in a tractor. This implies that they had only a partial understanding of tractor engine systems.

However, 8.68 per cent of the candidates had a good performance on the question. Most of them correctly attempted both parts. In part (a), they clearly described the components of the tractor fuel system. Examples of correct responses included: the fuel storage tank, *which stores and supplies fuel to the internal combustion engine*; fuel filters, *which prevent clogging in the carburetor or fuel injector*; the fuel lift pump, *which raises fuel into the combustion system*; and the fuel injector, *used in diesel engines to inject a precise amount of fuel at high pressure into the cylinder, where it mixes with hot compressed air*. Other responses included: the manifold, *which is a collection of tubular components used to conduct the air–fuel mixture to the*

engine; the fuel sediment bowl, *which collects water and heavy particles from the fuel to prevent engine damage*; the fuel supply line, *which transports fuel from the tank to various parts of the system*; the fuel pressure regulator, *which maintains consistent fuel pressure to the injector*; the carburetor, *which mixes fuel and air before it enters the engine*; and the fuel return line, *which returns unused fuel from the engine or injector back to the tank*. Such responses indicate a good understanding of the subject matter.

Moreover, in part (b), they were able to explain how the two types of air cleaner work. The correct responses were: dry air cleaner *uses a disposable material such as felt or waxed paper that is pleated to filter dust*; oil bath air cleaner *draws in air that passes over a trough of oil, where dust particles are deposited*. These responses indicate the candidates' good understanding of the ignition system. Extract 2.2 is a sample of the correct responses to the question.

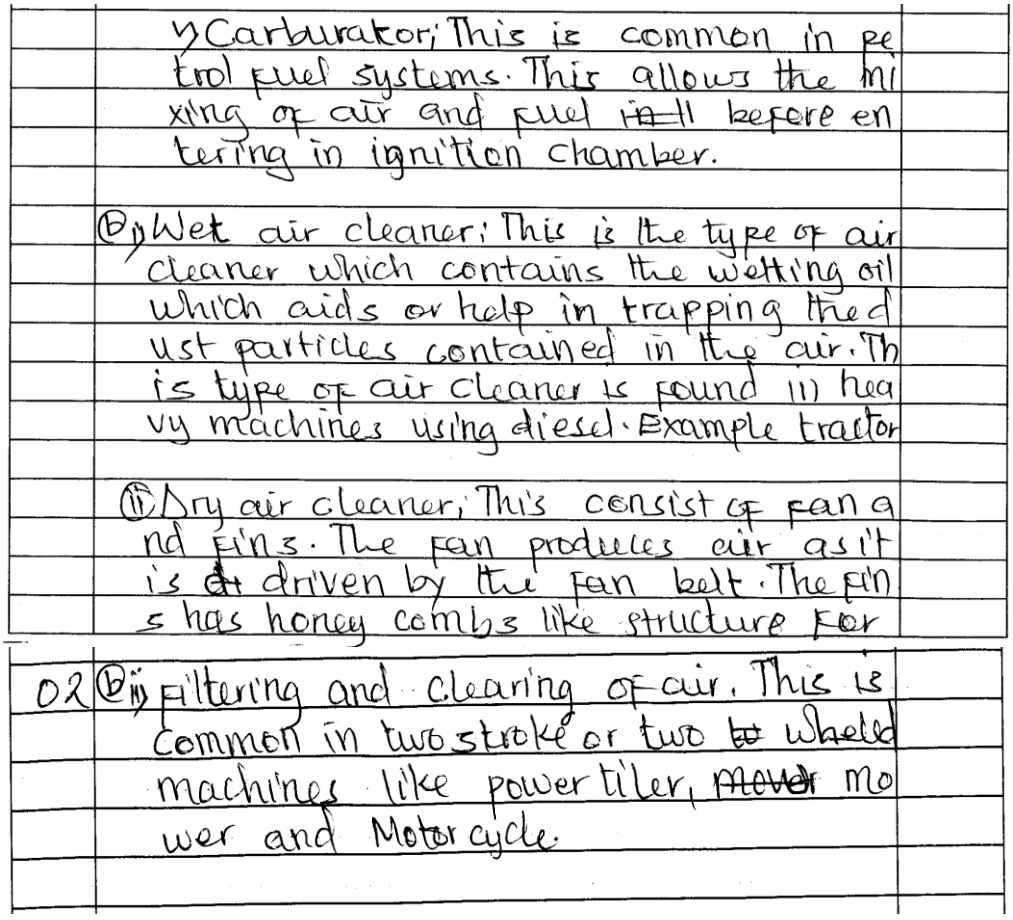

02 @i) Fuel tank; This is the structure which hold and store the fuel while waitin g for consumption. In petrol fuel sys tem it has a fuel pump

ii) Fuel pump; This is special for pumpin g the fuel from the tank toward the ig nition center. It is present in petrol fu

02 @ii) el system because the tank for fuel is located below the combustion and ig nition system.

iii) Filters; Filters are important for filter ing the particles contained in the fu el. These particles includes sediment s and metal parts. This ensures the safety of the combustion chamber.

iv) Sedimental bowl; This is responsible for storing and reserving the filter ed particle materials from the fuel. The sediment bowl should be cleaned for certain interval of period.



Extract 2.2: A sample of the candidates' correct responses to question 2.

Extract 2.2 presents responses from a candidate who answered almost the entire question correctly, although some marks were lost due to lack of clarity in explaining the dry air cleaner in part (b).

2.1.3 Question 3. Introduction to Irrigation

(a) *Account for the five benefits of a proper irrigation.*

(b) *Enumerate five ways in which irrigation water is conveyed to the farm.*

The question examined candidates' knowledge and skills of irrigation. It was attempted by all 1,094 candidates (100%), of whom 677 (61.88%) scored between 0.0 and 3.0 marks, 388 (35.47%) scored between 3.5 and 5.5 marks, and 29 (2.65%) scored between 6.0 and 8.5 marks. Figure 3 illustrates the distribution of the candidates' scores for this question.

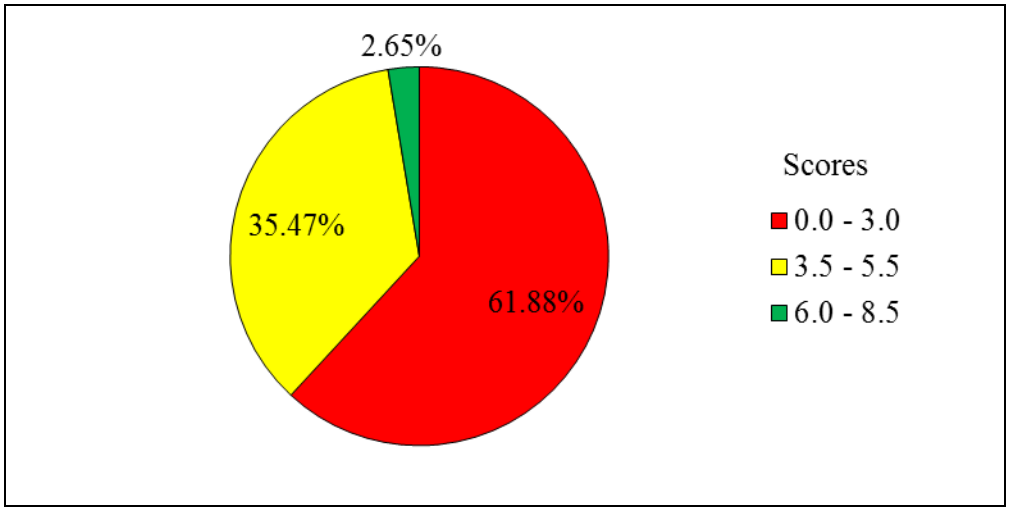
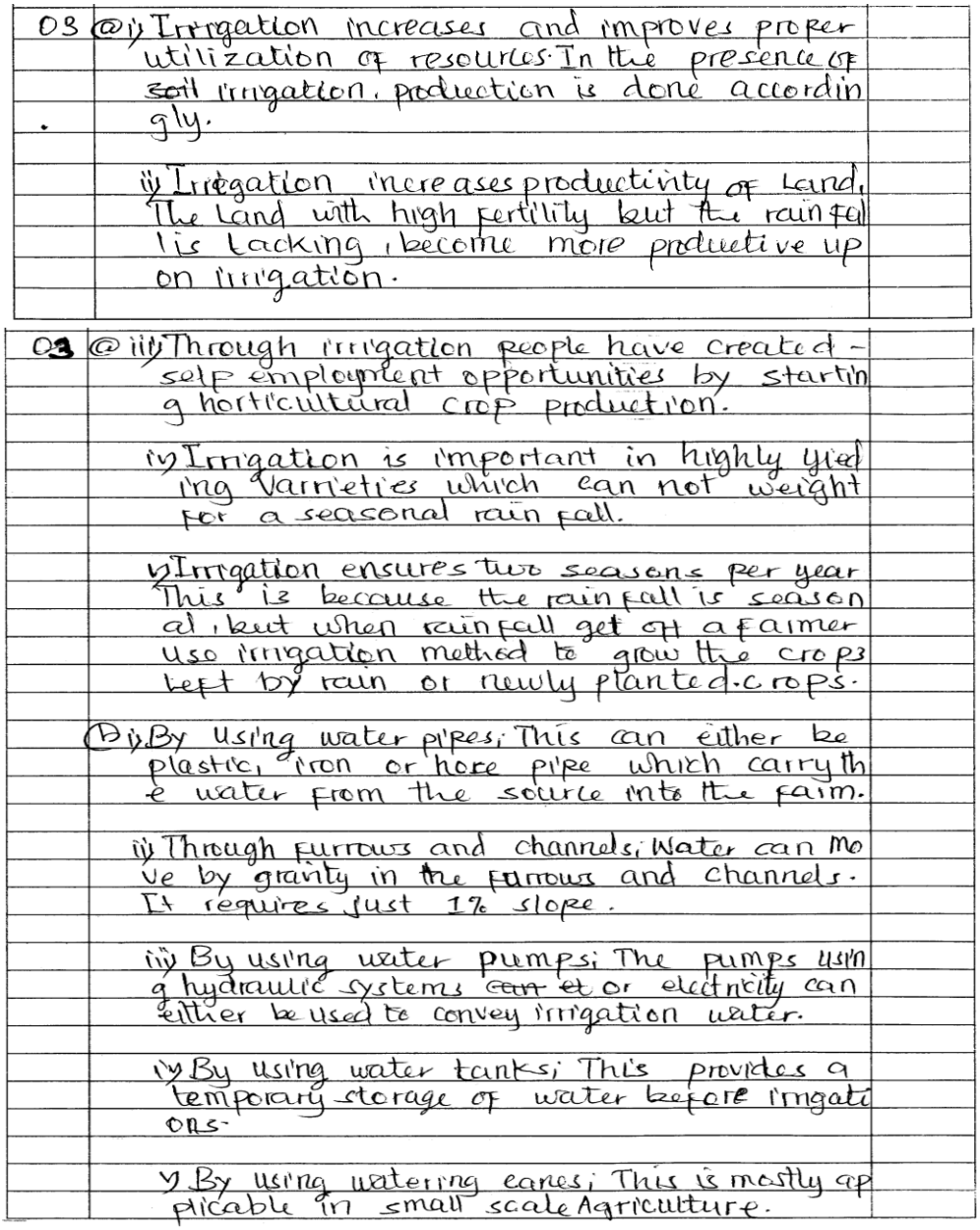


Figure 3: *Candidates' Performance on Question 3*

Figure 3 shows that 38.12 per cent of the candidates scored between 3.5 and 8.5 marks, while 61.88 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was average.

Data analysis reveals that only 2.65 per cent of the candidates had good performance on the question. The majority provided correct responses to almost all parts. In part (a), they successfully explained the benefits of proper irrigation. They provided correct responses such as *it promotes crop production for the export market and therefore contributes to the country's revenue*, *irrigation during the dry period increases crop yields and ensures a steady supply of food throughout the year*, *irrigation maximizes the utilisation of resources like in arid and semi-arid areas*, *irrigation provides a regular, reliable, and adequate supply of water in areas with little or no rainfall*, *irrigation is a source of employment in areas where it is used extensively*, *it reduces damages by lowering high atmospheric temperatures*, and *it increases the efficiency of fertiliser use and reduces its cost of application*. Similarly, in part (b), they were able to enumerate ways by which irrigation water is conveyed to the farm. The correct responses included *open channel*, *free flow pipes*, *pressure pipelines*, *pumping*, and *syphoning*. These responses show adequate knowledge and skills about irrigation. Extract 3.1 presents a sample of the correct responses from one of the candidates.



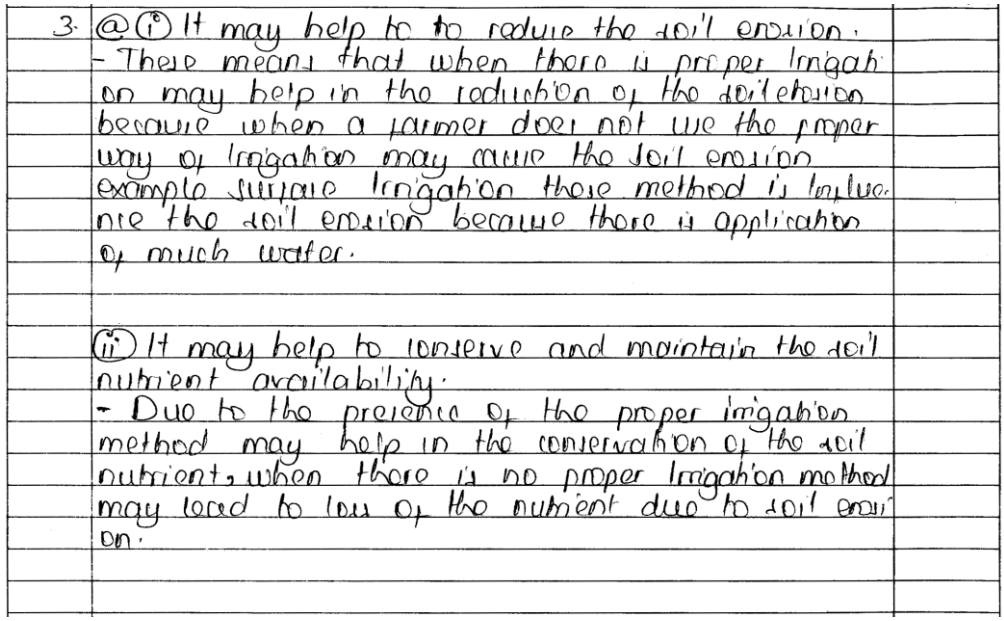
Extract 3.1: A sample of the candidates' correct responses to question 3.

Extract 3.1 presents the responses from a candidate who demonstrated a good understanding of the concepts in the question. The candidate provided correct responses to almost all parts of the question, except in part (b) (iv) and (v).

Furthermore, the analysis shows that 35.47 per cent of the candidates had an average performance. Most of them correctly accounted for the benefits of proper irrigation in part (a) of the question. However, in part (b), the majority

provided the methods of irrigation instead of the channels through which irrigation water is conveyed to the farm. This suggests that the candidates had only partial knowledge and skills regarding the concept of irrigation.

Nevertheless, 61.88 per cent of the candidates had a weak performance on the question. The majority answered almost all parts of the question incorrectly. In part (a), they failed to account for the benefits of proper irrigation. They provided various incorrect responses such as *helps to reduce labour cost*, *helps to control weeds*, *helps to increase lifespan of machines*, *it helps to reduce fuel consumption*, *it helps to control pests*, and *it helps to minimise spoilage of crops*. Likewise, in part (b), they failed to enumerate the channels through which irrigation water is conveyed to the farm. Examples of incorrect responses included sources of irrigation water such as *rivers*, *lakes*, *streams*, *dams*, and *rain*. Other incorrect responses were unrelated to the demands of the question, such as: *climate of the area*, *availability of labour*, *availability of material*, *may lead to loss of micro-organisms*, *it may cause illuviation of nutrients from horizons*, *it creates employment opportunities*, and *may cause eluviation of materials from the upper surface*. These responses indicate a lack of knowledge and skills about irrigation. Extract 3.2 is a sample of responses from a candidate who provided incorrect responses to the entire question.


3. @(i) It may help to to reduce the soil erosion.
- These means that when there is proper Irrigation may help in the reduction of the soil erosion because when a farmer does not use the proper way of Irrigation may cause the soil erosion example surface Irrigation these method is to use. nce the soil erosion because there is application of much water.

(ii) It may help to conserve and maintain the soil nutrient availability.
- Due to the presence of the proper irrigation method may help in the conservation of the soil nutrients, when there is no proper Irrigation method may lead to loss of the nutrient due to soil erosion.

(iii) It may help to avoid the Increase of acidity soil.
- There means that when there is poor Irrigation may Influence the Increase of the soil acidity because example the use of surface Irrigation method the use of there method may lead to an Increase of the soil acidity because water are applied much without boundaries.

(iv) Help in avoid of the Leaching.
- There is the washing away of the nutrient down the ~~use~~ soil with an influence of water there may lead to loss of the nutrient in the

3. @ soil. But when there is proper Irrigation may avoid the Leaching proiem to occur in a soil and Increase of the production.

(v) It may help to avoid floods and it help to minimize in the loss of water in some of the method example drip Irrigation may help in the conservation of water. Due to floods may help in reduce the nutrients and also cause the soil erosion.

3b (ii) Drip Irrigation.
- These means that is the type of Irrigation in which water are move from the drips to the soil with the small holes that are found in that drip.
(i) It help to reduce evaporation.

(ii) It minimise the use of water.

(iii) It avoid spread of disease.

(iii) Sprinkler Irrigation.
- These is the method of Irrigation that may be used in Irrigation and are may be used in the small scale farming because the farmers use the buckets and other and have the advantages and disadvantages because it consumes time.

(iv) Overhead Irrigation.
- These is the method that may be used in the farm for the irrigation purpose in which water are moved from one place to another and are controlled.

(v) Border Irrigation method.
- These involve the control of water from furide to furide the water and these may help to facilitate and reduce the lou of water.

3. (b) Furrow Irrigation.
- These is the application of water in a drill and the water are free moving at the whole farm these method have more disadvantage than the advantages because it;
i. Spread disease.

(ii) Lead to lou of water.

(iii) Soil erosion.

(iv) Leaching.

Extract 3.2: A sample of the candidates' incorrect responses to question 3.

Extract 3.2 is an example of responses from a candidate who provided incorrect responses to the entire question. The candidate gave various incorrect responses in part (a) and listed methods of irrigation instead of the channels for conveying irrigation water to the farm in part (b).

2.1.4 Question 4: Introduction to Soil Science

A soil is formed by the interaction of complex processes including the physical and chemical disintegration of parent rocks driven by some factors. Briefly explain four factors which are influential for soil formation.

The question tested candidates' understanding of the soil formation. It was attempted by all 1,094 candidates (100%), of whom 83 (7.59%) scored

between 0.0 and 3.0 marks, 430 (39.30%) scored between 3.5 and 5.5 marks, and 581 (53.11%) scored between 6.0 and 9.5 marks. Figure 4 presents the distribution of the candidates' scores for this question.

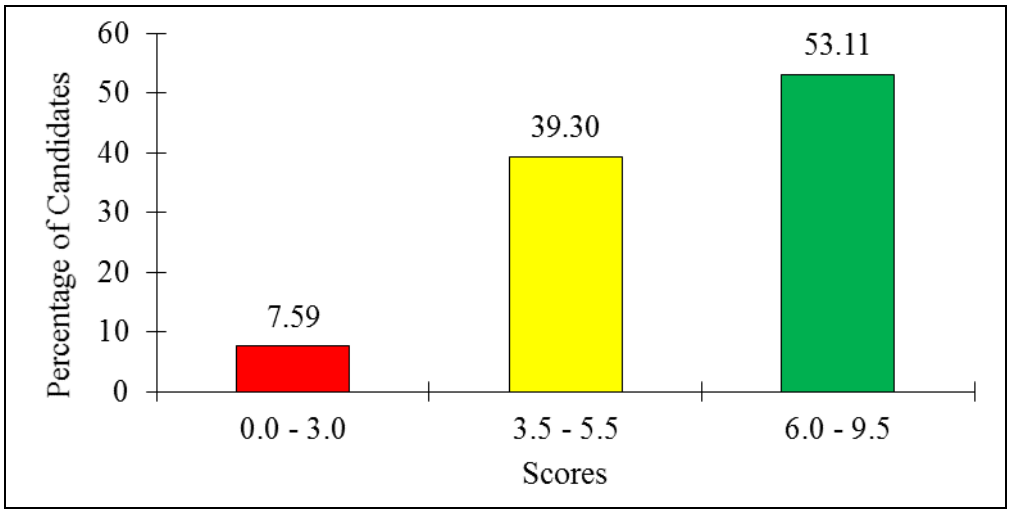


Figure 4: *Candidates' Performance on Question 4*

Figure 4 shows that 92.41 per cent of the candidates scored between 3.5 and 9.5 marks, while 7.59 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was good.

The performance statistics show that 53.11 per cent of the candidates did well on the question. Most of them were able to explain the factors that influence soil formation. Examples of correct responses included: *climate* such as temperature and rainfall; *living organisms*, such as vegetation, micro-organisms, animals, and humans; *relief* (*or topography*), which affects erosion and modifies climate and the water–air relationship; *parent material*, meaning the rocks from which the soil develops; and *time*, since the maturity of the soil is determined by how long the soil-forming processes have acted. Such responses demonstrate the candidates' competence in understanding the factors influencing soil formation. Extract 4.1 is a sample of correct responses from a candidate who showed a good understanding of the subject matter.

4 Factors influencing soil formation

i) Nature of parent rock materials
- Nature of the rock determines the resistance of rocks to weathering agent. Basic rocks are less resistance to weathering process while Acidic rocks are more resistant to weathering process Due to that nature of rocks influences the soil formation.

ii) Climate
- On climate, temperature and rainfall influences soil formation as follows:
- Temperature when high allows for expansion of rocks and when cool allows contraction, ~~that~~ continous expansion and contraction dispose rocks to weathering or soil formation.
- Rainfall influence soil formation through influencing growth of vegetation hence root penetration cause loosing of soil particles apart. On other hand rain drops when splash on soil leads to soil formation.

iii) Living organisms.
- Large organisms cause soil formation when they walk and step on soil causes soil to desintegrate to small particles.
- Micro-organisms aids in organic matter composition in the soil hence they ~~is~~ influence soil formation
- Roots of vegetation when they penetrate to the soil they result to desintegration of ~~soil~~ rocks

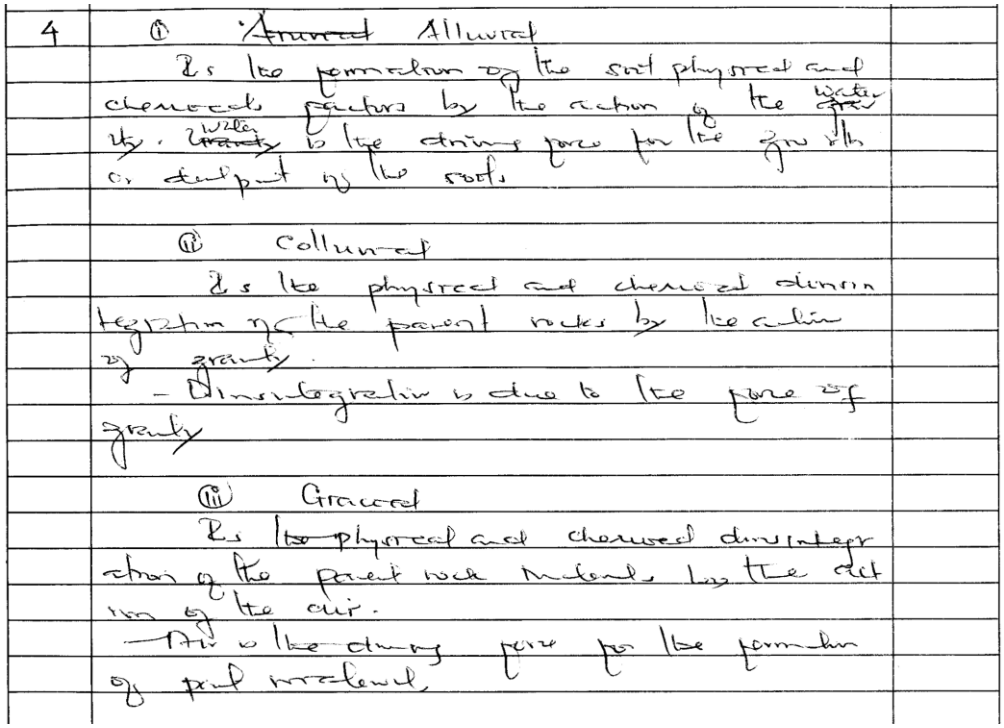
4 iv) Topography or Relief
- On stip slope areas rate of soil formation is very low because soil particles on stip slopes are easy washed by soil erosion agents.
- On gentle slope soil formation is high due to high accumulation of soil particles accumulated from stip slopes to gentle slope by erosion process.

Extract 4.1: A sample of the candidates' correct responses to question 4.

Extract 4.1 presents responses from a candidate who demonstrated competence in the subject matter by correctly responding to the question, except for the explanation of the nature of the parent material, which was insufficient.

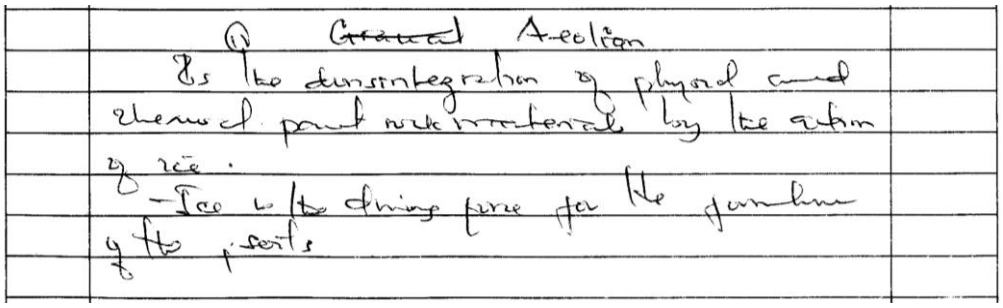
The statistics further indicate that 39.30 per cent of the candidates had an average performance on the question. Most of them managed to identify the factors influencing soil formation but failed to provide full explanations, while others did not exhaust all the required points. This signifies only a partial understanding of the subject matter.

Conversely, 7.59 per cent of the candidates had a weak performance on the question. The majority failed to explain the factors influencing soil formation. Some of them provided the basic processes in the development of soil horizons, such as *additions*, *losses*, *translocations*, and *transformations*. Others listed the processes of weathering, such as *mechanical or physical processes*, *chemical processes*, and *biological processes*. Similarly, others mentioned the chemical processes of soil formation, including *solution*, *hydrolysis*, *carbonation*, *oxidation-reduction*, and *mixed reactions*. Such responses signify the candidates' lack of understanding of the demands of the question. Extract 4.2 presents a sample of the incorrect responses from one of the candidates.


4 (i) ~~Alluvial~~ Alluvial
It is the formation of the soil physical and chemical factors by the action of the ~~water~~ by. ~~Water~~ is the driving force for the growth or development of the roots.

(ii) Colluvial
It is the physical and chemical disintegration of the parent rocks by the action by gravity.
- Disintegration is due to the force of gravity

(iii) Glacial
It is the physical and chemical disintegration of the parent rock materials by the action of the air.
- Air is the driving force for the formation of soil materials



Extract 4.2: A sample of the candidates' incorrect responses to question 4.

Extract 4.2 represent responses from a candidate who failed to address the subject matter, providing responses that were not related to the demand of the question.

2.1.5 Question 5: Introduction to Soil Science

Account for five factors that influence formation of soil structure.

The question tested candidates' understanding of the soil structure. It was attempted by all 1,094 candidates (100%), of whom 209 (19.10%) scored between 0.0 and 3.0 marks, 570 (52.11%) scored between 3.5 and 5.5 marks, and 315 (28.79%) scored between 6.0 and 10.0 marks. Figure 5 indicates the distribution of the candidates' scores for this question.

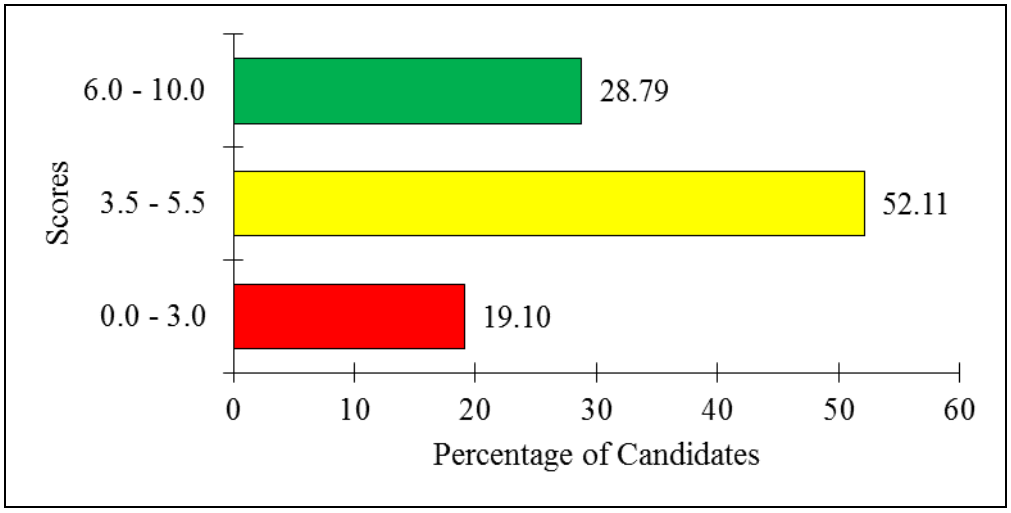


Figure 5: *Candidates' Performance on Question 5*

Figure 5 shows 80.90 per cent of the candidates scored between 3.5 and 10.0 marks, while 19.10 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was good.

The analysis shows that 28.79 per cent of the candidates performed well. Most of them were able to account for the factors that influence the formation of soil structure. The correct responses given by the candidates included *adsorbed cations: the positively charged ions held on exchangeable sites of colloidal particles*; *clay: the clay fraction in the soil plays an important role in aggregate formation*; *organic matter: the major cementing agent in the formation of granular aggregates in surface soil, especially in soils with low clay content*; *climate: rainfall is the most important factor in aggregate formation*; *alternate wetting and drying: drying or dehydration of soil colloids causes shrinkage of the soil mass and cementing of clay particles*; *freezing and thawing: alternate freezing and thawing is more effective in causing granulation of soil clods than alternate wetting and drying*; *soil organisms: earthworms, fungi, bacteria and other organisms mix the soil and create channels and aggregates*; *tillage practices: this has both favourable and unfavourable effects on granulation*; *cropping: crops with a good ground cover reduce deterioration of soil structure as the impact of raindrops on the soil surface is minimized by leaves and stems*; *soil amendments: addition of manure, fertiliser and lime has favourable effects on granulation through enhancement of root and shoot growth and microbial activities*; *parent materials: the mineral composition and texture of the original rock or sediments affect the soil's physical properties*; *time: over long periods of weathering, organic matter builds up and biological activities shape the soil structure*; and *topography: refers to the shape and features of the land surface that influence soil structure formation*.

These responses indicate that the candidates possessed adequate knowledge and skills regarding soil structure. Extract 5.1 presents a sample of the correct responses to the question.

5 Factors influencing soil structure formation

i) Organic matter content

-Organic matter act as cementing agent of soil particles to form aggregates. The soil with considerable amount of organic matter influences soil structure formation as aggregate formation is high

- Soil with low organic matter content or with no organic matter experience low soil structure formation as no cementing agent of soil particles.

ii) Clay content of the soil

- Clay act as cementing agent between individual soil particles. Soil with high clay content influences formation of aggregates by cementing individual particles together.

- On soil particles like that of sand with no clay content aggregate formation is not likely to occur.

5 iii) Micro-bial activities

- Micro-bial activities gives slime as end product during their activities, such slime produced act as cementing agent of soil particles to form soil structure.

- Also micro organisms helps in organic matter decomposition of which organic matter act as cementing agent.

iv) Climate
- Rainfall influences growth of vegetation in which root penetration allows compactness of the soil particles to hold the roots hence soil structure formation
- Temperature influence efficiency of micro-organisms to work on decomposition of organic matter which increase soil structure formation rate due to Organic matter content added by micro-organisms.

v) Agronomic practices like tillage
- Tillage may lead to development of soil structure or destruction of soil structure as follows:-
• Through tillage soil particles are loosely separated hence destruction of soil structure
• Also tillage can contribute to soil structure formation by exposing soil particles to agents of soil structure cementing by mixing well the soil particles with clay and organic matter.

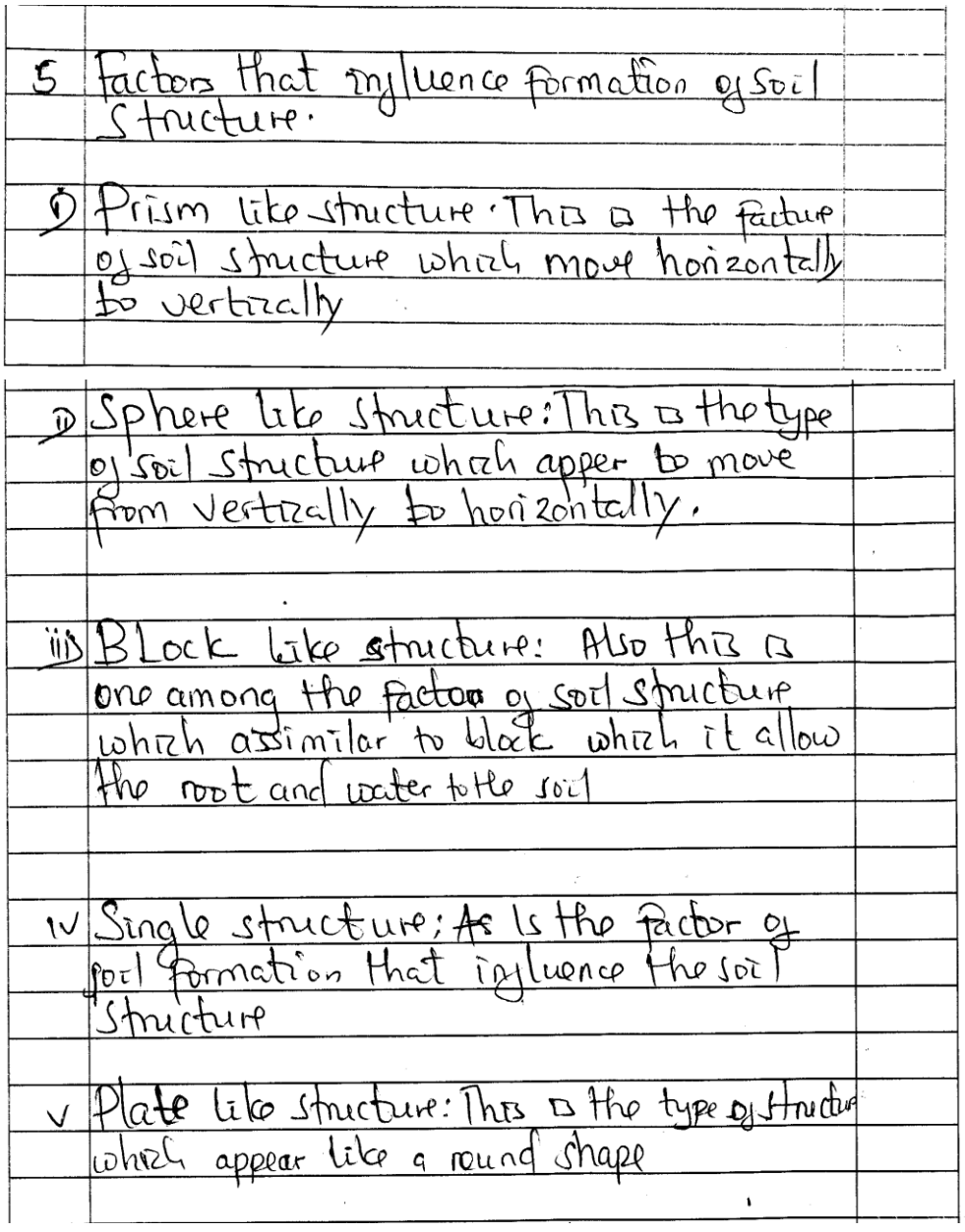
Extract 5.1: A sample of the candidates' correct responses to question 5.

Extract 5.1 indicates responses from a candidate who met the requirements of the question showing good mastery of the subject matter.

In addition, 52.11 per cent of the candidates had an average performance on the question. The majority did not mention all the required points, while others gave incomplete explanations, indicating inadequate knowledge of soil structure.

In contrast, 19.10 per cent of the candidates had a weak performance on the question. Most of them failed to account for the factors influencing the formation of soil structure. Some of them listed physical processes of weathering, such as *exfoliation*, *expansion*, *contraction*, *comminution*, and *abrasion*. Others mentioned agronomic practices such as *mulching*, *crop rotation*, *contour strip farming*, *use of cover crops*, *green manuring*, and

application of organic manure. These responses show a lack of understanding of the concept of soil structure. Extract 5.2 shows a sample of candidates' incorrect responses.



Extract 5.2: A sample of the candidates' incorrect responses to question 5.

Extract 5.2 is an example of responses from a candidate who performed poorly on the question by giving the types of soil structure instead of the factors influencing its formation.

2.1.6 Question 6: Introduction to Soil Chemistry

Under certain conditions, foliar fertilisation is considered to be a more appropriate method of fertiliser application than soil fertilisation. Briefly explain five superiorities of foliar fertilisation over soil fertilisation.

The question assessed the candidates' knowledge and skills of fertiliser application methods. It was attempted by all 1,094 candidates (100%), of whom 928 (84.83%) scored between 0.0 and 3.0 marks, 144 (13.16%) scored between 3.5 and 5.5 marks, and 22 (2.01%) scored between 6.0 and 9.0 marks. Figure 6 summarizes the distribution of the candidates' scores for this question.

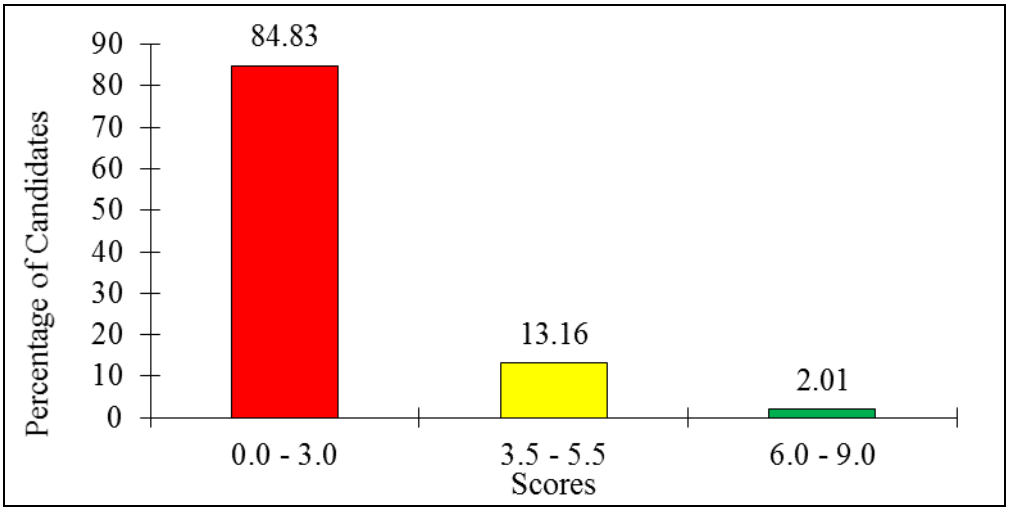
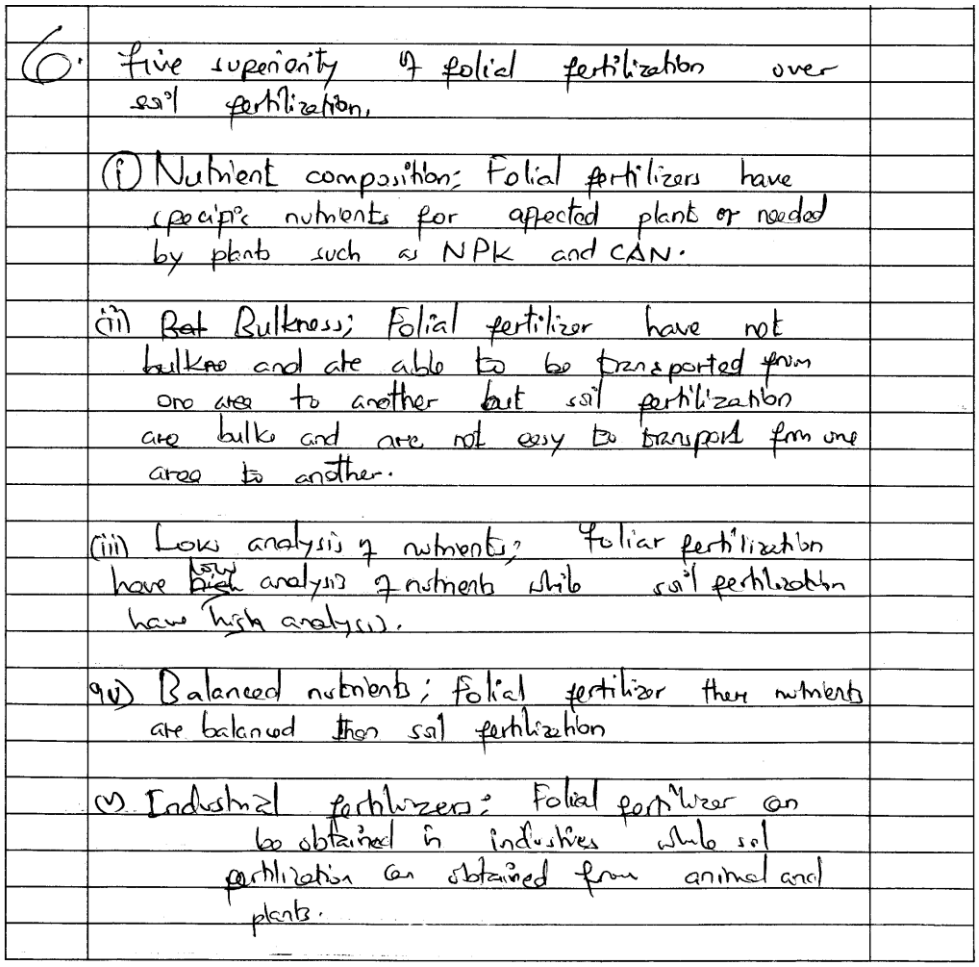


Figure 6: *Candidates' Performance on Question 6*

According to Figure 6, 15.17 per cent of the candidates scored between 3.5 and 9.0 marks, while 84.83 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was weak.

Data indicate that 84.83 per cent of the candidates performed poorly on the question. The majority failed to explain the superiority of foliar fertilisation over soil fertilisation. Some of them provided the qualities of a good

fertiliser, such as *should be obtained at a reasonable price*, *should not cause acidity to the soil*, *should be readily available*, *should release the nutrients slowly*, and *should increase yield*. Others gave the advantages of organic matter to the soil, such as *supplying food materials to the microorganisms*, *help to improve the soil structure*, *help to increase soil fertility*, *help to make the soil spongy*, and *make easy plant roots penetration through the soil*. Additionally, some candidates incorrectly listed the advantages of organic fertilisers over inorganic fertilisers. Such responses show that the candidates failed to understand the demands of the question. Extract 6.1 illustrates a sample of the incorrect responses to the question.


6. five superiority of folial fertilization over soil fertilization.

(i) Nutrient composition; Folial fertilizers have specific nutrients for affected plant or needed by plants such as NPK and CAN.

(iii) ~~Bat~~ Bulkness; Folial fertilizer have not bulkno and ate able to be transported from one area to another but soil fertilization are bulk and are not easy to transport from one area to another.

(iii) Low analysis of nutrients; Foliar fertilization have ~~high~~ low analysis of nutrients while soil fertilization have high analysis.

(v) Balanced nutrients; Folial fertilizer them nutrients are balanced than soil fertilization

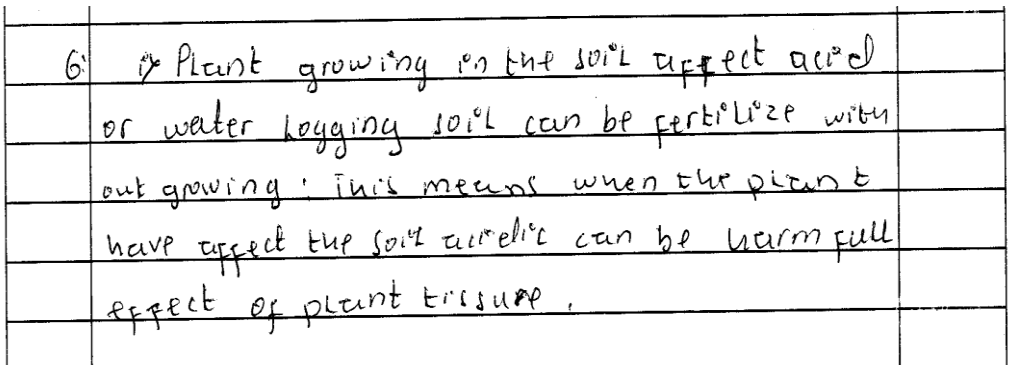
(v) Industrial fertilizers; Folial fertilizer can be obtained in industries while soil fertilization can obtained from animal and plants.

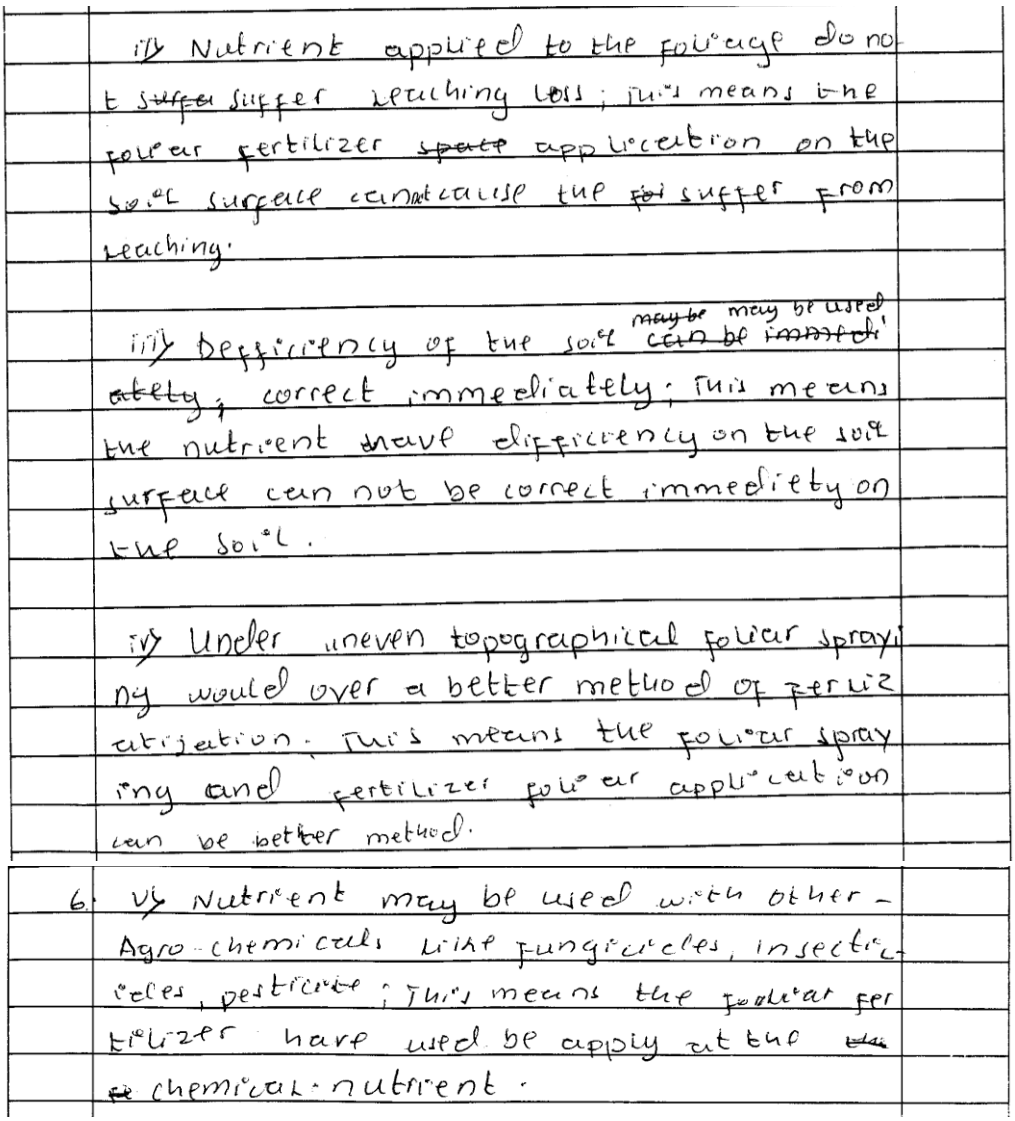
Extract 6.1: A sample of the candidates' incorrect responses to question 6.

Extract 6.1 shows responses from a candidate who did not understand the requirements of the question, hence provided various incorrect responses.

Moreover, the data reveal that 13.16 per cent of the candidates had an average performance on the question. Some of them provided correct points but failed to explain them fully, while others mentioned only a few. In some cases, although candidates stated the correct advantages of foliar fertilisation over soil fertilisation, they did not specify the underlying conditions that make foliar application superior. These responses indicate that the candidates had inadequate knowledge and skills regarding methods of fertiliser application.

However, only 2.01 per cent of the candidates performed well on the question. Most of them were able to explain clearly the superiority of foliar fertilisation over soil fertilisation. Correct responses included situations such as *arid and semi-arid areas where low soil moisture does not allow for effective soil fertilisation*; *when weather conditions affect fertiliser efficiency, for example, granulated fertilisers require* adequate water for dissolution; *when insect, weed, and disease control is needed, since foliar application can be applied simultaneously with insecticide or pesticide sprays*; *when most of the required nutrients are micronutrients, which are more effectively absorbed through foliar feeding*; *on uneven topography such as hill slopes and river valleys, where applying fertiliser to the soil can lead to nutrient fixation or loss through runoff*; *when nutrient deficiency symptoms must be corrected immediately*; and *when crops are grown on salt-affected, acidic, or waterlogged soils where soil fertilisation is less effective*. These responses show that the candidates had a good understanding of fertiliser application methods. Extract 6.2 presents a sample of the correct responses to this question.


6. i) Plant growing in the soil effect acid or water logging soil can be fertilize with out growing : this means when the plant have effect the soil already can be warm full effect of plant tissue.



Extract 6.2: A sample of the candidates' correct responses to question 6.

Extract 6.2 illustrates a candidate who responded correctly to the question. However, the explanation provided in part (ii) lacked reference to the underlying condition.

2.1.7 Question 7: Introduction to Soil Chemistry

Assess two effects of each of the following soil reaction on its fertility:

(a) *Very low soil pH*

(b) *Very high soil pH*

The question examined candidates' understanding of the concept of soil fertility. It was attempted by all 1,094 candidates (100%), of whom 534 (48.81%) scored between 0.0 and 3.0 marks, 429 (39.22%) scored between 3.5 and 5.5 marks, and 131 (11.97%) scored between 6.0 and 8.5 marks. Figure 7 shows the distribution of the candidates' scores for this question.

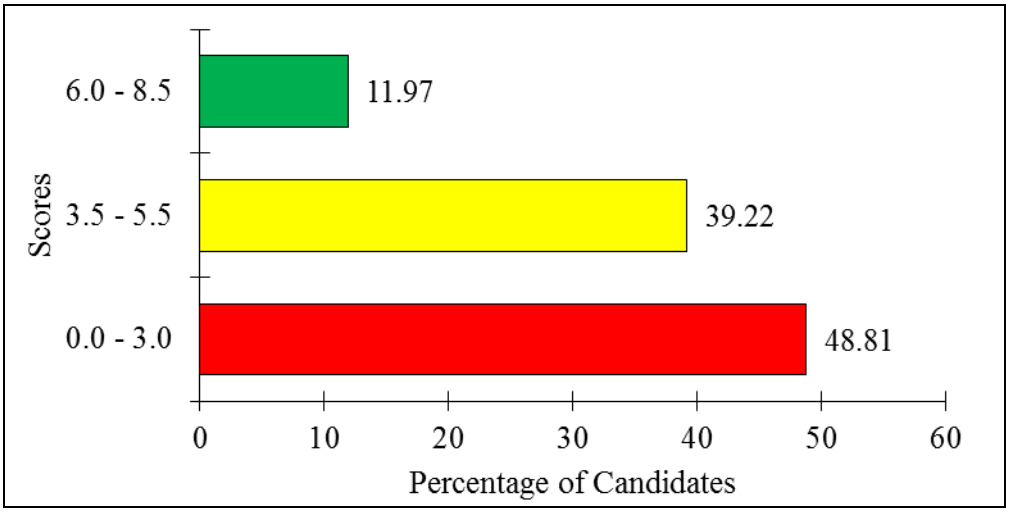


Figure 7: *Candidates' Performance on Question 7*

Figure 7 shows that 51.19 per cent of the candidates scored between 3.5 and 8.5 marks, while 48.81 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was average.

The statistics further show that 11.97 per cent of the candidates had good performance on the question. The majority provided correct responses to both parts of the question. In part (a), they were able to assess the effects of very low pH on soil fertility by giving responses such as: *it depresses the availability of some essential plant nutrients*, such as *phosphorus*, *potassium*, *calcium*, and *magnesium*; *it increases the solubility of iron (Fe)*, *manganese (Mn)*, and *aluminium (Al)*; *most of the soluble phosphorus, for instance, is fixed as complex and insoluble forms, making it unavailable to plant roots*; and *it increases the solubility of most trace or micronutrients to toxic levels (except molybdenum)*. For example, *iron*, *aluminium*, and *manganese* can *become so soluble that they reach toxic levels for certain plants and can also hinder microbial activity in the soil*.

Likewise, in part (b), they were able to assess the effects of very high pH on soil fertility. Correct responses included: *most essential micronutrients become less available (except molybdenum)*; *phosphorus availability decreases due to the formation of relatively insoluble phosphorus compounds such as di-calcium and tri-calcium phosphates*; and *excessively high pH can cause harmful effects on plant tissues*. These responses indicate that the candidates understood the effects of pH on soil fertility in both cases. Extract 7.1 presents a sample of the correct responses to the question.

7. To assess the two effects of each of the following soil reaction on its fertility.

a) Very low soil pH.

When the soil has a very low pH means it is acidic. The acidic soil is the one whose H^+ concentration is greatly larger compared to OH^- concentration. Very low soil pH may be due to several reasons such as Heavy Rainfall or Irrigation and Extensive and continuously use of chemical fertilizers.

The following are the effects of a very low soil pH.

(i) It increases the availability of Al^{3+}, Zn, Mg and Iron to toxic level which poses detrimental effects to plant tissues.

When the soil is too acidity, it may results towards the availability of different ions and metals including minerals to a toxic level. For example, Availability of Al^{3+}, Zn, Mg and Iron (Fe) may reach to toxic level which have a significant detrimental effect to plant tissues such as roots, stems and leaves.

(ii) It reduces Microbial and Microbial activity in the soil, thus, reduces the rate of decomposition reaction in the soil.

If a soil is more acidic i.e very low soil pH (Very acidic) it may affects the role of microorganisms in the soil thus, reduces the rate of decomposition of organic matter in the soil which increases the fertility and productions of the soil for different agricultural and Economic use.

b) Very high soil pH.

When the soil has a very high soil pH reflects that, there are more basic cations in the soil compared to acidic cations. The concentration of OH^- ions in the soil is greater compared to H^+ ions concentrations. Normally, a very high soil pH is due to overliming of the soil. That can be corrected using Neutralization reaction and application of fertilizers and increase of irrigation water.

The following are two effects of very high soil pH on its fertility;

01; It depresses the availability of important minerals and nutrients in the soil thus, makes difficult to be obtained by plant body.

A very high soil pH depresses the availability of important soil minerals such as (Mg) Magnesium and Iron which are important for plant development and growth,

7 b) ii) Presence of Sodium ions (Na^+) retards the availability of Phosphorus in the soil which reduces soil fertility and Also, inhibits the ability of the plant to absorb Moisture.

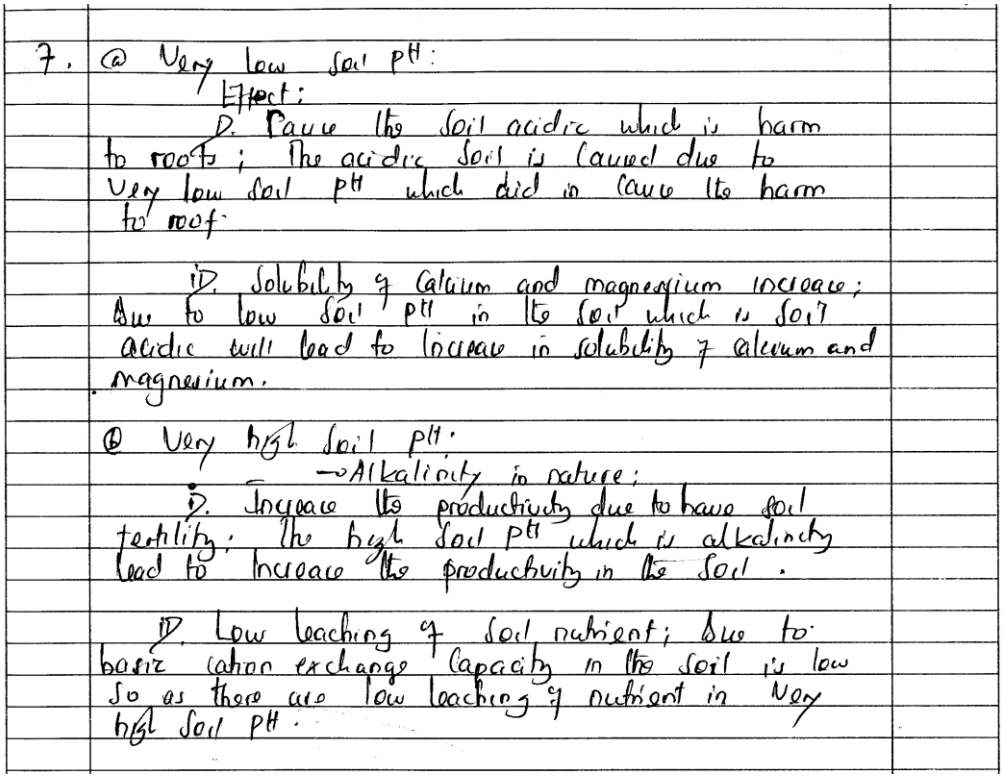
Sodium ions are among of the base cations that may results to a high soil pH. Availability of more sodium ions reduces the availability of phosphorus minerals and other minerals in the soil. Also, the metal basic ions may reduce the ability of the plant body to absorb the soil solution and moisture from the atmosphere.

Extract 7.1: A sample of the candidates' correct responses to question 7.

Extract 7.1 presents responses from a candidate who did well on the question. However, the candidate provided only partially correct responses in part (b).

Furthermore, the statistics indicate that 39.22 per cent of the candidates had an average performance on the question. Most of them provided partially correct responses in both parts, implying that they had inadequate knowledge of the effects of pH on soil fertility.

Conversely, 48.81 per cent of the candidates had a weak performance on the question. Most of them responded incorrectly to both parts of the question. In part (a), they failed to assess the effects of very low soil pH on soil fertility. The candidates provided various incorrect responses, such as *it increases carbonic acid, the soil will have high fertility, fertility will reduce due to a rise in the water table, it will favour the occurrence of diseases, it may cause scorching of plant leaves*, and *it may increase the quantity of nutrients in the soil*. Likewise, in part (b), they were unable to assess the effects of very high pH on soil fertility, providing various incorrect responses including that *the soil will have high fertility, soil fertility will reduce due to high water-holding capacity, it causes soil acidity, it improves microbial activity, it causes plant diseases such as fungal infections*, and *it causes dehydration in plants*. These responses in both parts indicate a lack of knowledge of the subject matter. Extract 7.2 presents a sample of the incorrect responses from one of the candidates.


7. @ Very low soil pH:
Effect:
D. Cause the soil acidic which is harm to roots; The acidic soil is caused due to very low soil pH which did in cause the harm to roof.

ii. Solubility of Calcium and magnesium increase; Due to low soil pH in the soil which is soil acidic will lead to increase in solubility of calcium and magnesium.

@ Very high soil pH:
- Alkalinity in nature;
i. Increase the productivity due to have soil fertility; The high soil pH which is alkalinity lead to increase the productivity in the soil.

ii. Low leaching of soil nutrient; Due to basic cation exchange capacity in the soil is low so as there are low leaching of nutrient in very high soil pH.

Extract 7.2: A sample of the candidates' incorrect responses to question 7.

Extract 7.2 indicates responses from a candidate who lacked subject matter knowledge hence provided various incorrect responses to both parts of the question.

2.1.8 Question 8: Farm Planning

On 30th June 2018, a farmer at Kialile had the following information on his farm:
There were 20 herds of cattle each valued Tsh 100,000/=, 30 sheep each valued Tsh 40,000/= and 25 goats each valued Tsh 50,000/=. In the store there were ten bags of animal feeds each worth Tsh 5,000/= and four bags of fertiliser each worth Tsh 40,000/=. He also had a tractor that was five years old and was bought for Tsh 15,000,000/= with an expectation that it would last for 30 years and then be written off at a value of Tsh 1,000,000/=. Write down an Inventory and Valuation for this farmer as on 30th June 2018.

The question tested the candidates' knowledge and skills of farm records. It was attempted by all 1,094 candidates (100%), of whom 272 (24.89%) scored between 0.0 and 3.0 marks, 360 (32.93%) scored between 3.5 and 5.5 marks, and 461 (42.18%) scored between 6.0 and 10.0 marks. Figure 8 shows the distribution of the candidates' scores for this question.

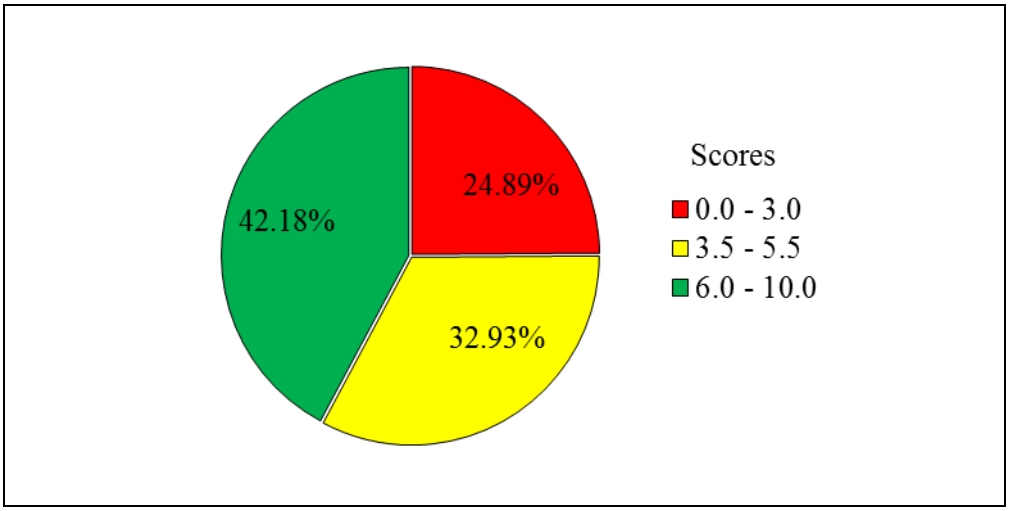


Figure 8: *Candidates' Performance on Question 8*

Figure 8 indicates 75.11 per cent of the candidates scored between 3.5 and 10.0 marks, while 24.89 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was good.

Data analysis reveals that 42.18 per cent of the candidates performed well on the question. The majority were able to write an inventory and valuation of farm assets as follows:

Annual depreciation (D) = $\frac{C-S}{N}$

= $\frac{15,000,000 – 1,000,000}{30}$

= 466,666.67

Where C = Original cost of the asset

S = Salvage value

N = Number of years the asset is expected to last

Total depreciation after five years = 466,666.67x5

= 2, 333,333.35

Value of tractor (Tsh) = 15,000,000 – 2,333,333.35

= 12,666,666.65

KIALILE FARM, VALUATION AS AT 30TH JUNE 2018

Asset:	*Value*	
Machinery		
Tractor	*12,666,666.65*	
		12,666,666.65
Livestock:		
20 cattle @ 100,000	*2,000,000.00*	
30 sheep @ 40,000	*1,200,000.00*	
25 goats @ 50,000	*1,250,000.00*	
		4,450,000.00
Animal feeds		
10 bags @ 5,000	*50,000.00*	
		50,000.00
Fertiliser		
4 bags @ 40,000	*160,000.00*	
		160,000.00
TOTAL		*17,326,666.65.*

This indicates that the candidates had adequate knowledge and skills of writing an inventory and valuation of farm assets. Extract 8.1 presents a sample of the correct responses to the question.

08 Annual depreciation = $\frac{\text{Original cost} - \text{Salvage value}}{\text{Number of years}}$

$A.D = \frac{(15,000,000 - 1,000,000)\ Tsh}{30}$

$A.D = \frac{14,000,000\ Tsh}{30}$

$A.D = 466,666.6667\ Tsh$

For a five years old tractor

$= 466,666.6667\ Tsh \times 5$

$= 2,333,333.333\ Tsh$

Hence

A.D = Original value $-2,333,333.333$

$A.D = 15,000,000 - 2,333,333.333$

$A.D = 12,666,666.67\ Tsh$

∴ Hence Value for a tractor is $12,666,666.67\ Tsh$

08 Data: Production groups

Animals = 4,450,000 Tsh

Animal feeds = 50,000 Tsh

Fertilizer = 160,000 Tsh

Machine = 12,666,666.67 Tsh.

INVENTORY AND VALUATION OF A FARMER AT KIALILE AS ON 30th JUNE 2018

Group of production	Total
Animals	
20 herds of cattle @ 100,000/=	2,000,000 Tsh
30 sheeps @ 40,000/=	1,200,000 Tsh
25 goats @ 50,000/=	1,250,000 Tsh
Animal feeds	
10 bags @ 5000 Tsh.	50,000 Tsh
Fertilizer	
4 bags @ 40,000 Tsh	160,000 Tsh
Machine	
Tractor value	12,666,666.67 Tsh
Total	17,326,666.67 Tsh

Extract 8.1: A sample of the candidates' correct responses to question 8.

Extract 8.1 indicates responses from a candidate who attempted the question correctly, demonstrating good mastery of the subject matter.

Additionally, the analysis shows that 32.93 per cent of the candidates had an average performance on the question. Despite preparing the correct layout of an inventory and valuation, the majority failed to calculate the depreciation of a

tractor, which led to an incorrect valuation of the farm. This suggests that the candidates had a poor understanding of the valuation of farm machinery and implements.

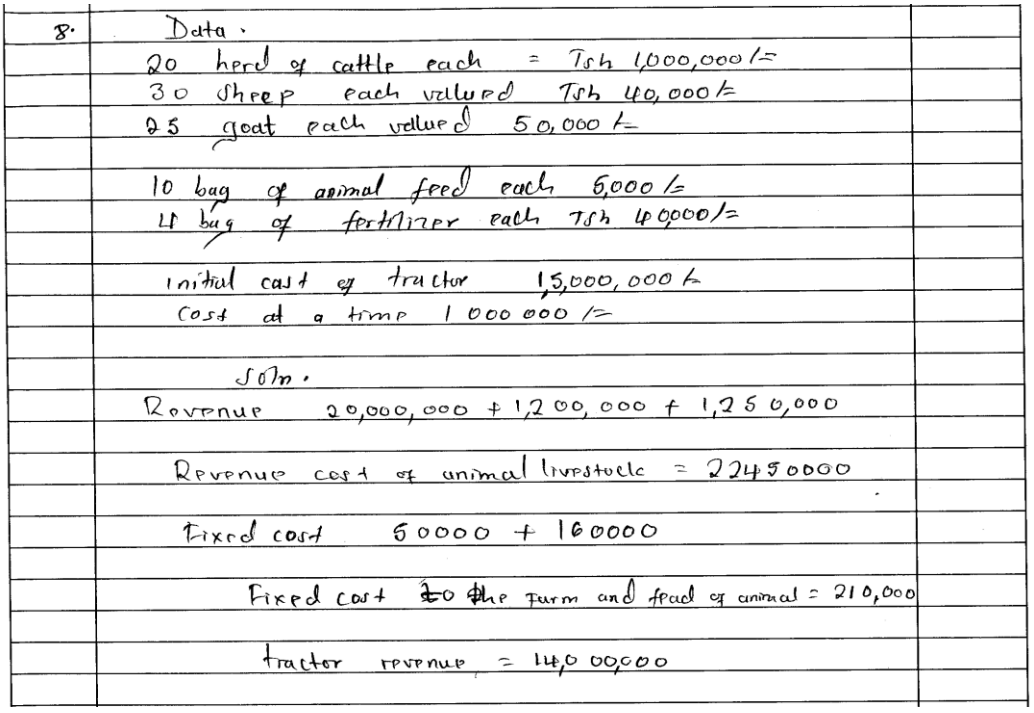
On the other hand, 24.89 per cent of the candidates had a weak performance on the question. Most of them failed to write an inventory and valuation of the farm assets. An example of incorrect inventory and valuation of farm assets was as follows:

LOSSES	*SH*	*Ct*	*GAINS*	*SH*	*Ct*
Extra costs	*200,000*	*00*	*Cost Saved*		
20 cattle @ 100,000	*2,000,000*	*00*	*10 bags of animal feeds @ 5,000*	*50,000*	*00*
30 sheep@ 40,000	*1,200,000*	*00*	*4 bags of fertiliser @ 40,000*	*1,600,000*	*00*
25 goats @ 50,000	*750,000*	*00*	*Extra revenue*	*1,000,000*	*00*
Revenue lost	*125,000,000*	*00*			
15,000,000 x5	*129,150,000*	*00*	*TOTAL*	*2,650,000*	*00*
TOTAL			*Net Loss*	*126,500,000*	*00*
				129,150,000	*00*

Inventory
20 herds of cattle
30 sheep
25 goats
10 bags of animal feeds,
Inventory
100,000 + 40, 000 + 50,000 + 5,000 + 40,000 = 235,000 TZs

The candidate attempted to prepare a layout for a profit and loss account instead of an inventory and valuation of farm assets, and consequently made incorrect entries. This indicates that the candidate had a poor understanding of

how to write an inventory and valuation of farm assets. Extract 8.2 presents an example of an incorrect response from one of the candidates.


8. Data.
20 herd of cattle each = Tsh 1,000,000/=
30 sheep each valued Tsh 40,000/=
25 goat each valued 50,000/=
10 bag of animal feed each 5,000/=
15 bag of fertilizer each Tsh 40,000/=
Initial cost of tractor 15,000,000/=
Cost at a time 1 000 000/=
Sol.
Revenue 20,000,000 + 1,200,000 + 1,250,000
Revenue cost of animal livestock = 22450000
Fixed cost 50000 + 160000
Fixed cost ~~to~~ the farm and feed of animal = 210,000
tractor revenue = 14,000,000

Extract 8.2: A sample of the candidates' incorrect responses to question 8.

Extract 8.2 presents a response from a candidate who performed poorly on the question by preparing an incorrect layout of the inventory and valuation of farm assets.

2.1.9 Question 9: Fundamentals of International Trade

The following table shows the yield of potatoes and soya beans in Tanzania and Uganda.

Country	***Soya beans(bag/ha)***	***Potatoes (bag/ha)***
Tanzania	*4*	*30*
Uganda	*15*	*6*

(a) *Suppose the total area of land that is available for producing the two crops in each country is 400 hectares and without specialisation half of the total*

land is used to produce beans and the other half is used to grow potatoes. What will be the total production of beans and potatoes in both countries?

(b) *Suppose each country decides to specialise in the production of crop in which it has a comparative advantage. What will be the total production of beans and potatoes in both countries?*

The question assessed the candidates' understanding of the concept of comparative advantage. It was attempted by all 1,094 candidates (100%), of whom 547 (50.00%) scored between 0.0 and 3.0 marks, 251 (22.94%) scored between 3.5 and 5.5 marks, and 296 (27.06%) scored between 6.0 and 10.0 marks. Figure 9 indicates the distribution of the candidates' scores for this question.

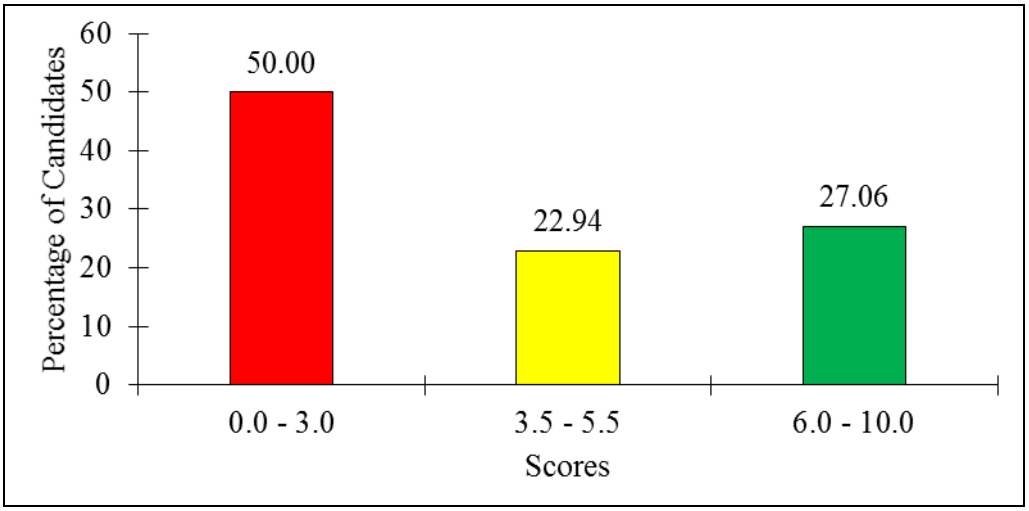


Figure 9: *Candidates' Performance on Question 9*

Figure 9 indicates that 50.00 per cent of the candidates scored between 3.5 and 10.0 marks, while 50.00 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was average.

The candidates who had a good performance on the question were 27.06 per cent. Most of them responded correctly to almost all parts. In part (a), they managed to compute the total production of beans and potatoes in both countries without specialisation by using half the area for beans and the other half for potatoes as follows:

Country	*Soya beans*	*Potatoes*
	(200 Ha)	*(200 Ha)*
Tanzania	*800*	*6,000*
Uganda	*3,000*	*1,200*
Total production	*3,800*	*7,200*

Likewise, in part (b), the candidates managed to compute the total production of beans and potatoes in both countries when each one specialises based on the law of comparative advantage as follows:

Country	*Soya beans*	*Potatoes*
	(400 Ha)	*(400 Ha)*
Tanzania	*00*	*12,000*
Uganda	*6,000*	*00*
Total production	*6,000*	*12,000*

The candidates' responses justify a good understanding of the law of comparative advantage. Extract 9.1 presents a sample of the correct responses to the question.

9. a. In Uganda potatoes = 6 bag/ha

1 ha = 6 bag

200 ha (?)

$= \frac{200 \text{ ha} \times 6 \text{ bag}}{1 \text{ ha}}$

= 1200 bag of potatoes in Uganda.

Total production of potatoes in both countries

= 1200 bag + 6000 bag

= 7,200 bags of potatoes.

∴ The total production of beans and potatoes in both countries are shown below.

Country	Soya beans (bag/200ha)	Potatoes (bag/200ha)	Total
Tanzania	800	6,000	
Uganda	3,000	1,200	
Total	3,800.	7,200	

b. Solution.

Tanzania has comparative advantage in producing potatoes because it yield more bags than that of Uganda.

Also Uganda has comparative advantage in producing soya beans because many number of bags are produces than that of Tanzania.

9. a. Solution.

Total area of land = 400 hectare.

The two types of crops are produced in each country

$= \frac{400 \text{ hectare}}{2} = 200$ hectare

Therefore, 200 hectares are available to produce both soya beans and potatoes in each country.

Then,

In Tanzania soya beans = 4 bag/ha.

1 ha = 4 bag

200 ha = ?

$= \frac{4 \text{ bag} \times 200 \text{ ha}}{1 \text{ ha}}$

= 800 bag of soya beans

In Uganda soya beans = 15 bag/ha.

Then,

1 ha = 15 bag

200 ha = ?

$= \frac{200 \text{ ha} \times 15 \text{ bag}}{1 \text{ ha}}$

= 3,000 bags of soya beans.

Total production of beans in both countries

= 800 bag + 3,000 bags

= 3800 bags of soya beans.

In Tanzania potatoes = 30 bag/ha

1 ha = 30 bag

200 ha = ?

$= \frac{200 \text{ ha} \times 30 \text{ bag}}{1 \text{ ha}}$

= 6000 bags of potatoes in Tanzania

9. b. Total area of land in each country is 400 hectare.

- When the country become specialized to produce the crop that she has a comparative advantage, that means all amount of land (400 hectare) will be used to produce such a crop.

Then.

Tanzania has comparative advantage on the production of potatoes = 30 bag/ha.

1 ha = 30 bag

400 ha = ? required

$$= \frac{400 \text{ ha} \times 30 \text{ bag}}{1 \text{ ha}}$$

= 12000 bag of potatoes.

Uganda has comparative advantage on the production of soya beans = 15 bag/ha

1 ha = 15 bag

400 ha = ? required

$$= \frac{15 \text{ bag} \times 400 \text{ ha}}{1 \text{ ha}}$$

= 6,000 bags of soya beans.

∴ The total production of potatoes in Tanzania will be 12000 bag and total production of soyabeans in Uganda will be 6,000 bags.

Country	Soya beans (bag/400ha)	Potatoes (bag/400ha)
Tanzania	-	12000
Uganda	6,000	-
Total	6000	12,000

Extract 9.1: A sample of the candidates' correct responses to question 9.

Extract 9.1 exemplifies responses from a candidate who had good mastery of the subject matter. The candidate responded correctly in both parts of the question.

Moreover, 22.94 per cent of the candidates had an average performance on the question. Most of them provided correct responses to part (a) of the question. However, in part (b), most failed to compute the total production when the country specialises based on its comparative advantage. This indicates that the candidates had inadequate knowledge of the law of comparative advantage.

On the other hand, 50.00 per cent of the candidates had a weak performance. Most of them provided incorrect responses to both parts. In part (a), they failed to compute the total production of beans and potatoes in both countries when each country decides to diversify. Examples of such responses from one of the candidates were as follows: -

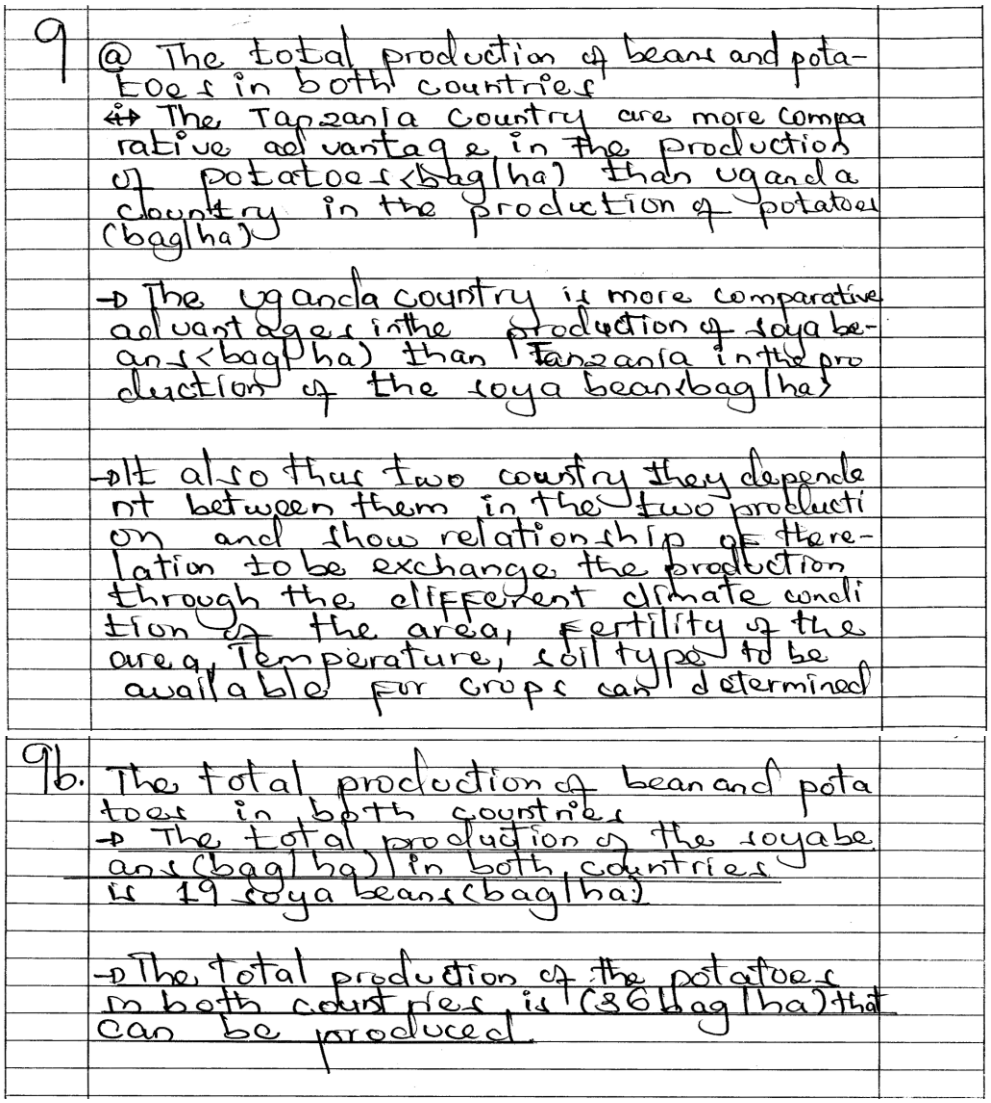
Total production of beans and potatoes
Tanzania = 4 + 30
= 34,
200 + 4 = 204, 200 + 30 = 230,
4x +30y = 400
15x + 6y = 40
Soln.
4x + 30y = 400
15x + 6y = 400
X = 22.5, y = 10.32
Production of beans in Tanzania 4 x 22.5 = 90 bags
Production of potatoes in Tanzania 30 x 10.3 = 309 bags/ha
Uganda = 15 + 6
= 21
200 + 15 = 215 and 200 + 6 = 206
Production of soya beans in Uganda 15 x 22.5 = 337.5
Production of potatoes in Uganda 6 x 10.3 = 61. 8 bags/ha

Similarly, in part (b), the candidates were unable to calculate the total production of beans and potatoes in both countries after specialisation. Example of incorrect responses from one of the candidates were as follows:

Tanzania = 15 + 4 = 19

Uganda = 30 + 6 = 36
Potatoes production is 370.8 bags.
Bean production is 427.5 bags.
The total production of both crops in both countries is 370.8 + 427.5 = 798.3 bags/ha

These responses from the candidates demonstrate a lack of understanding of the law of comparative advantage. Extract 9.2 presents a sample of the incorrect responses to the question.


9 @ The total production of beans and potatoes in both countries
↔ The Tanzania country are more comparative advantages in the production of potatoes (bag/ha) than uganda country in the production of potatoes (bag/ha)

→ The uganda country is more comparative advantages in the production of soya beans (bag/ha) than Tanzania in the production of the soya beans (bag/ha)

→ It also thus two country they dependent between them in the two production and show relationship of the relation to be exchange the production through the different climate condition of the area, fertility of the area, Temperature, soil type to be available for crops can determined

9b. The total production of bean and potatoes in both countries
→ The total production of the soyabeans (bag/ha) in both countries is 19 soya beans (bag/ha)

→ The total production of the potatoes in both countries is (36 bag/ha) that can be produced.

E**xtract 9.2:** A sample of the candidates' incorrect responses to question 9.

Extract 9.2 is a sample of a response from a candidate who attempted the question incorrectly, failing to meet its requirements.

2.1.10 Question 10: Introduction to Agricultural Production Economics

HIV/AIDS is a pandemic disease that negatively affects agriculture and labour productivity in Tanzania. Explain:

(a) *Five impacts posed by the disease.*

(b) *Five measures that the government of Tanzania can take to mitigate the problem.*

The question tested the candidates' understanding of the effects of HIV/AIDS on labour productivity. It was attempted by all 1,094 candidates (100%), of whom 372 (34.00%) scored between 0.0 and 3.0 marks, 651 (59.51%) scored between 3.5 and 5.5 marks, and 71 (6.49%) scored between 6.0 and 8.5 marks. Figure 10 shows the distribution of the candidates' scores for this question.

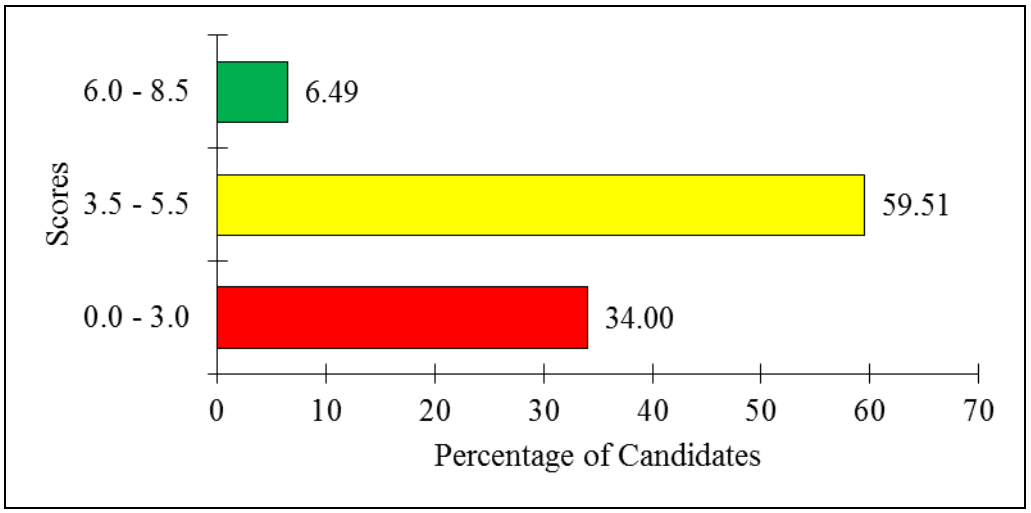


Figure 10: *Candidates' Performance on Question 10*

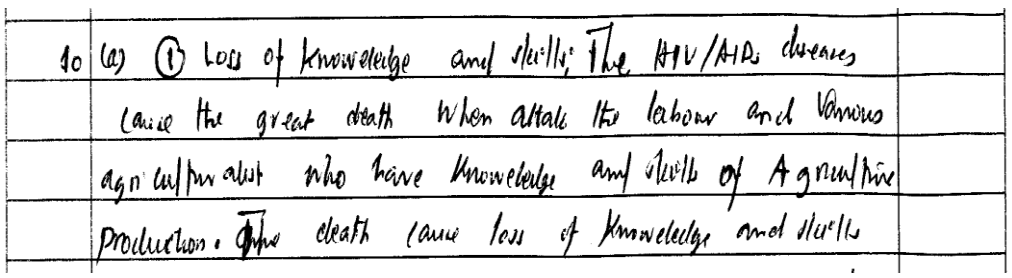
Figure 10 indicate that, 66.00 per cent of the candidates scored between 3.5 and 8.5 marks, while 34.00 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was good.

Performance statistics indicate that 6.49 per cent of the candidates did well on the question. The majority provided correct responses to almost all parts. In

part (a), they were able to explain the impacts posed by HIV/AIDS. Examples of correct responses include: *reduction in the acreage of land under cultivation*; *loss of agricultural and management skills*; and *loss of family physical assets such as land, livestock, buildings, and farm implements*. This is due to the fact that sometimes farmers are obliged to sell these assets to support a sick person or to cover funeral costs. Other correct responses mentioned included: *depletion of human capital* and *the shift from labour-intensive crops to less labour-demanding ones due to reduced ability to hire labour*. Such responses indicate good mastery of the subject matter.

Similarly, in part (b), the candidates correctly explained measures that the government should take to mitigate the problem of HIV/AIDS. Correct responses included: *assisting affected households to maintain their agricultural production and training more extension staff*; *introducing less labour-intensive crops such as cassava and potatoes instead of maize*; *promoting small livestock enterprises such as poultry and goats to reduce labour shortages*; and *supporting labour-saving cultural practices such as communal labour through incentive systems at the community level*.

Additional correct responses included recommendations such as: *making small loan facilities readily available to affected households to help them purchase agricultural inputs*; *reviewing the Land Act or land tenure system to enable youth and women in Tanzania to acquire land*; *abolishing customs and traditional practices that increase women's vulnerability to HIV/AIDS*; *providing accessible healthcare in rural areas through mobile clinics and rural health centres offering HIV testing, treatment, and counselling*; and *raising awareness in farming communities by conducting HIV/AIDS education campaigns in local languages and involving community leaders to share accurate information and reduce stigma*. These responses demonstrate a good understanding of the ways to mitigate HIV/AIDS. Extract 10.1 presents responses from a candidate who performed well on the question.


10 (a) (i) Loss of knowledge and skills: The HIV/AIDS diseases
cause the great death when attack the labour and Various
agriculturalist who have knowledge and skills of Agriculture
production. The death cause loss of knowledge and skills

(ii) Poor allocation of capital: Many farmers allocate many funds to treat the family member when attacked by HIV/AIDs. The care and treatment cause capital that was to be used in agriculture used in another things which treatments of sick family member.

(iii) Cause the health risks: When the labour and farmers affected by HIV/AIDs their efficiences decreases that cause the lower in agriculture productions and thus lower yields.

(iv) Time consuming: many farmers and labours that affected by HIV/AIDs spent much time of dealing with diseases rather than agriculture activities. This cause the decrease in concentration for production of the agriculture products. Also some people deals on looking family member who affected by HIV/AIDs.

(v) Loss of land: some farmers may sell their land in order to get capital for treating the diseases that leads to loss of land natural resources.

10 (b) (i) Enacting strict rules against female genital multilation and other cultural practices like which influent ance that facilitate spread of HIV/AIDs.

(ii) provision education to people about impacts, effects, ways to avoid the spread of HIV/AIDs. This will create awareness to the people about diseases.

(iii) Emphasizing the use of condoms and safe sexual intercause that may avoid the diseases to spread rapidly and reduces chances of transmission.

(iv) Ensure the Medicine like ARV's provided to reduce the impact of virus and increase immunity of the bodies and also in hospitals balance diety should be emphasize also.

(v) providing financial assistance and cancelling to the affected in order to live well and avoid torture that may lead into great effects in minds. This may enable them to get capital to stand a business that will help to obtain basic needs.

Extract 10.1: A sample of the candidates' correct responses to question 10.

Extract 10.1 illustrates responses from a candidate who provided correct responses, signifying good mastery of the subject matter. However, the candidate gave incorrect responses in part (b)(iii) and an insufficient response in part (b)(v).

The statistics further indicate that 59.51 per cent of the candidates had an average performance on the question. The majority of them were unable to exhaust the points in both parts of the question. This indicates that the candidates had inadequate knowledge about HIV/AIDS.

On the contrary, 34.00 per cent of the candidates performed poorly on the question. Most of them attempted the question incorrectly. In part (a), they failed to explain the impacts posed by HIV/AIDS. Some of them provided the symptoms of HIV/AIDS in an individual instead of its impacts. Examples of such incorrect responses include *it leads to loss of weight, opens a room for other diseases to attack like TB, it leads to frequent coughing, causes diarrhoea and high fever*. Others gave a variety of incorrect responses such as *it increases cost, it causes loss of unity, it leads to societal conflicts*, and *it leads to a decline of good behaviour*.

Likewise, in part (b), the candidates failed to explain the measures that the government of Tanzania should take to mitigate the problem. Most of their responses focused on methods for self-protection against transmission and stigmatisation. Examples of such incorrect responses from the candidates include *avoid eating and sharing utensils with victims*, *avoid playing with them, avoid inheriting widows, always keep your body clean*, and *if you're not married, abstain from sexual intercourse*.

The responses in both parts indicate a failure to understand the demands of the question. Extract 10.2 presents a sample of the incorrect responses to the question.

10. (a) Five impact of HIV and AIDS that posed in the farm.
(i) Loss in weight of the labour: The labour when they are affected by HIV/AIDS they can loose the weights
(ii) They can cause virus pathogen to the human and even crops that they can affects so it will transmitt the virus diseases called Retrovirus.
(iii) They can distruct the liver cells of the human being by introducing the pathogens so ar to increase the entry ~~the~~ the human body.
(iv) They can involve the Lower productivity of the crop: Because they are been caused by viruses of they low their productivity rate.
(v) They can affect the blood stream of a human being: ~~the~~ a human can be affect ed in the blood so they decrease the transfers of the blood to human.

(b) Measures that the government of Tanza nia to take to migitate the problem.
(i) Avoid the chance of tools like blade Scissors because they contain the virsies in their hands
(ii) Avoid sharing of under wear because they transmitts through sharing of some of the materials

(iii) Treatment should be follow when they can affect either crop or a labour before the virus can transmits to the body.
(iv) Should avoid the contact with the injury of the infected person with HIV/AIDS because they transmitts through blood transfusion.
(v) Avoidance of the sexual intercourse due to the transfers of the blood during the sexual activity conducted so they avoid sex of the affected person with HIV/AIDS.

Extract 10.2: A sample of the candidates' incorrect responses to question 10.

Extract 10.2 presents responses from a candidate who demonstrated poor mastery of the subject matter by providing various incorrect responses to both parts of the question.

2.2 THE ANALYSIS OF THE CANDIDATES' PERFORMANCE IN 134/2 AGRICULTURE 2

2.2.1 Question 1: Plant Diseases

Non- pathogenic plant diseases are not greatly taken into consideration when one talks of plant diseases.

(a) *What do you understand by non-pathogenic plant diseases?*

(b) *Giving an example of a disease in each case, examine the following factors that cause non-pathogenic plant diseases in plants:*

(i) *Temperature fluctuation*

(ii) *Moisture fluctuation*

(iii) *Light fluctuation*

(iv) *Nutritional deficiencies*

The question assessed the candidates' understanding of non-pathogenic plant diseases. It was attempted by all 1,094 candidates (100%), of whom 538 (49.18%) scored between 0.0 and 3.0 marks, 392 (35.83%) scored between 3.5 and 5.5 marks, and 164 (14.99%) scored between 6.0 and 9.0 marks. Figure 11 shows the distribution of the candidates' scores for this question.

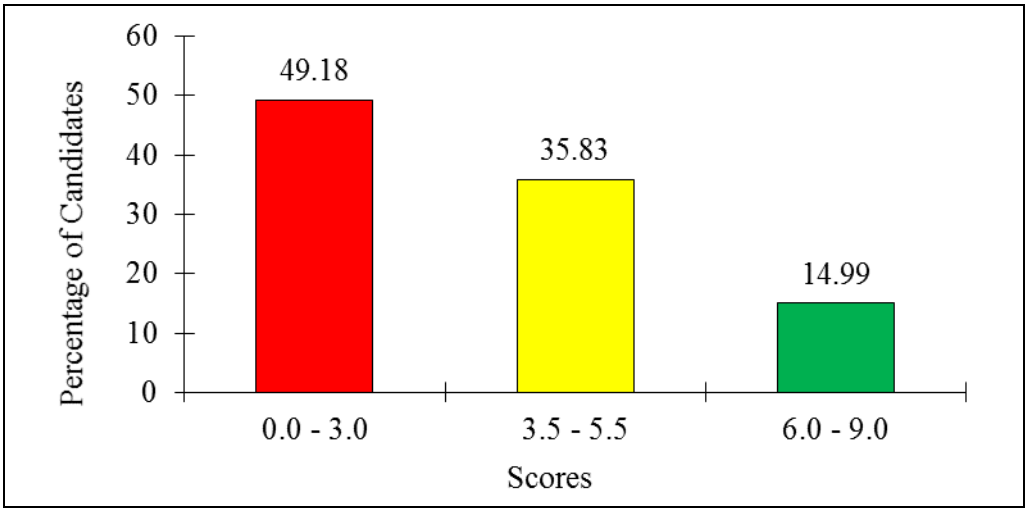


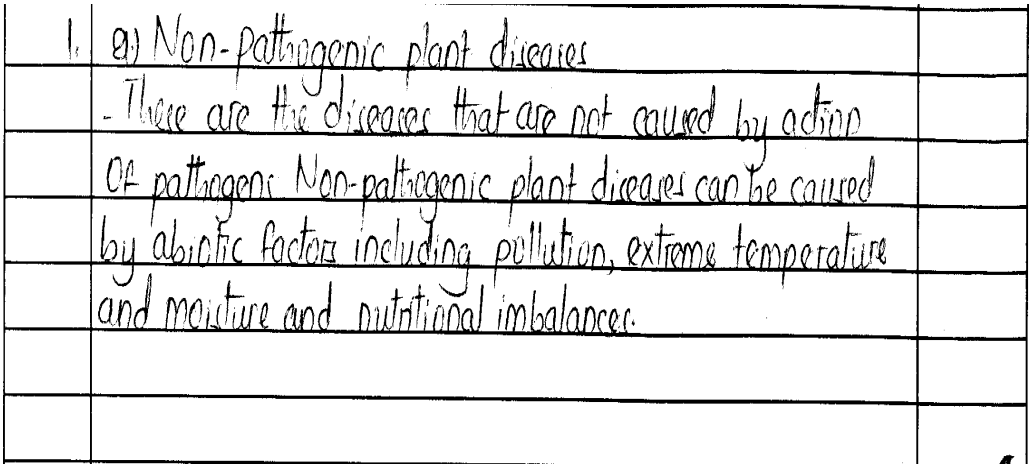
Figure 11: *Candidates' Performance on Question 1*

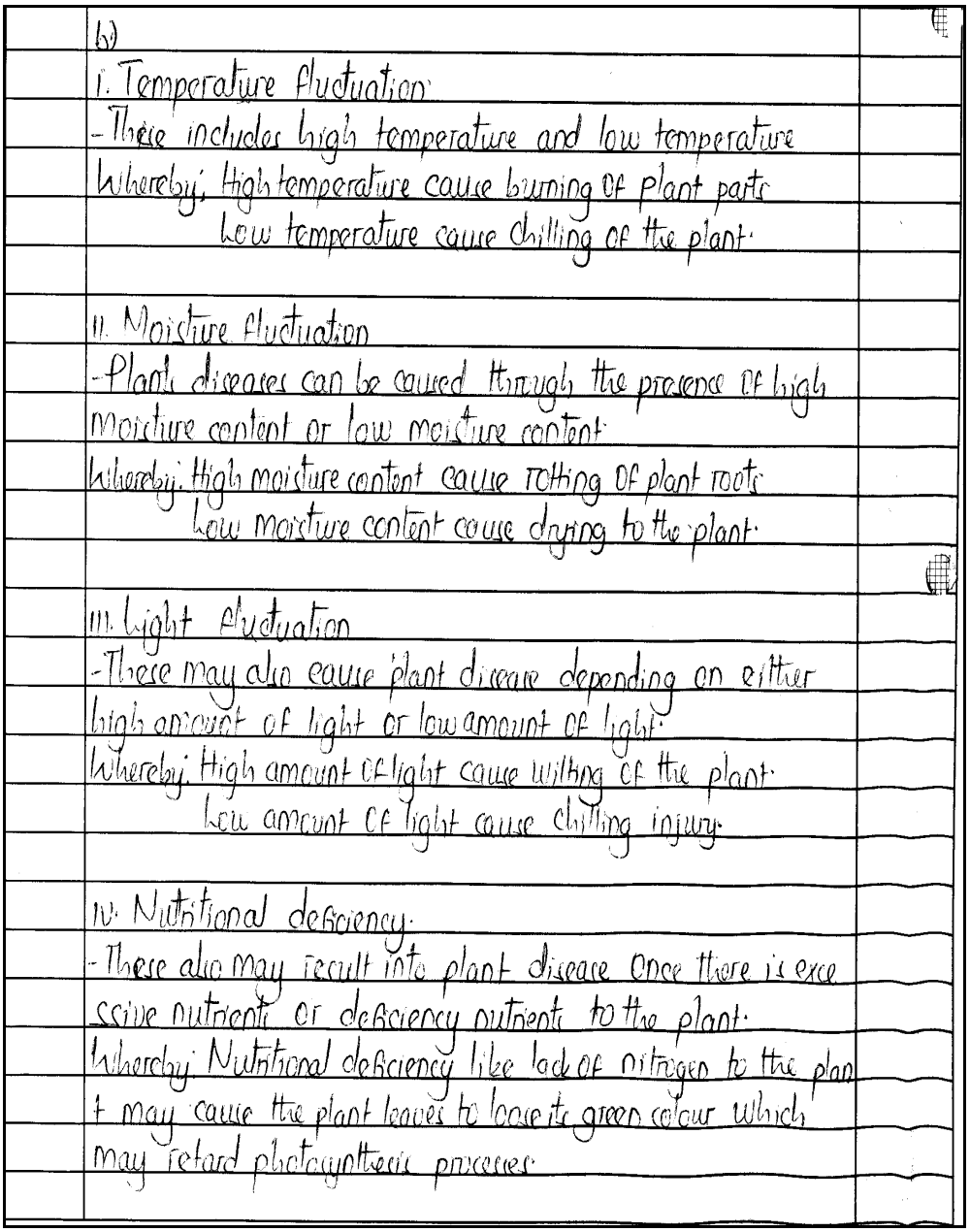
Figure 11 shows 50.82 per cent of the candidates scored between 3.5 and 9.0 marks, while 49.18 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was average.

Data show that 14.99 per cent of the candidates achieved good performance. The majority of them correctly attempted almost all parts of the question. In part (a), they were able to give the meaning of a non-pathogenic plant diseases as *those caused by abiotic agents or environmental stress*.

Likewise, in part (b), the candidates managed to examine the factors that cause non-pathogenic plant diseases and provided an example in each case as follows: (i) Temperature fluctuation – *plants are harmed when exposed to extremely high or low temperatures for an extended period. High temperatures can cause scorching of leaves, leaf stress, poor pollen viability, sunscald on fruits, and protein denaturation in plant tissues. Low temperatures or frost may damage leaves, buds, and fruits;* (ii) Moisture fluctuation – *excessive soil moisture or drought can lead to damage of plant tissues;* (iii) Light fluctuation – *insufficient light reduces photosynthesis, leading to etiolation, leaf drop, and reduced fruit set, while excessive light can cause leaf scorch;* (iv) Nutritional deficiencies – *plants require both major and minor nutrients for proper growth. Deficiency in any of these minerals disrupts essential plant functions and may lead to plant death.*

These responses from the candidates demonstrate adequate knowledge and skills of non-pathogenic plant diseases. Extract 11.1 presents a sample of the correct responses to the question.


1. a) Non-pathogenic plant diseases
- These are the diseases that are not caused by action of pathogens. Non-pathogenic plant diseases can be caused by abiotic factors including pollution, extreme temperature and moisture and nutritional imbalances.



Extract 11.1: A sample of the candidates' correct responses to question 1.

Extract 11.1 exemplifies the responses from a candidate who performed well on the question, except in part (b)(iii) and (iv), where the candidate provided inadequate responses.

However, data indicate that 35.83 per cent of the candidates had an average performance on the question. Most of them correctly explained the meaning of non-pathogenic plant diseases in part (a). However, they only partially examined the factors that cause non-pathogenic plant diseases in part (b), which signifies an inadequate understanding of these diseases.

However, 49.18 per cent of the candidates performed poorly on the question. Most of them provided incorrect responses to almost all parts. In part (a), they failed to give the correct meaning of non-pathogenic plant diseases. They provided various incorrect responses such as *non-pathogenic plant diseases are abiotic factors that occur in the environment such as air, soil pH, and high temperatures, these are diseases that do not show any sign, these are types of pathogens that are not able to cause any disease to plants, these are non-zoonotic diseases,* and *these are diseases that are caused by fungi*.

Likewise, in part (b), the majority of the candidates failed to examine the factors that cause non-pathogenic diseases in plants. They provided various incorrect responses such as temperature fluctuations - *cause necrosis, cause abiotic diseases, cause the host to develop, cause swelling of roots, and cause shading of branches*; moisture fluctuations -*can cause anthracnose, lead to blight disease, cause pathogenic diseases, cause dieback disease, and cause rosette in plants*; light fluctuations - *can cause cancer in plants, cause yellowing, lead to immaturity, make plants susceptible to bacterial diseases, and lead to death of plant roots*; and *nutritional deficiencies - cause damping off disease, lead to decreased food due to failure of the plants to photosynthesize, cause plants to develop many branches, lead to environmental degradation, and cause the plants to develop galls*. These responses signify a lack of understanding of the subject matter. Extract 11.2 illustrates incorrect responses from one of the candidates.

1(b) host or bacteria, virus and fungi which may support the occurrance of non pathogenic plant disease in such area condition.

iii) Light fluctuation
This is among of the factor which may lead to the occurance of non-pathogenic plant disease because light is among of the factor which support the growth of plant well so when will be fluctuated will cause the occurance of non pathogenic plant disease.

iv) Nutrition deficiencies
This also is among of the factor which may lead to occurance of non pathogenic plant disease some nutrition value is very important to plants if will be no nutrition value will aid to the occurance of non-pathogenic disease into the plants.

1@ Non pathogenic plant disease
Is the type of diseases which occur into the plants by the help of pathogens' which can spread disease from one plant to another

b) i) Temperature Fluctuation
This is among of factor which may lead to cause the occurance of non pathogenic plant disease because when the temperature is too high can or low may lead to ocurrange of non pathogenic disease because such disease can require high or low amount of temperature so the temperature fluctuation can support the occurance of non-pathogenic plant disease.

ii) Moisture fluctuation
This also is among of the factors which may cause or influence the occurance of non pathogenic plant disease in the farm since mustre can contain such

Extract 11.2: A sample of the candidates' incorrect responses to question 1.

Extract 11.2 illustrates responses from a candidate who had poor performance on the question, signifying a lack of the subject matter knowledge.

2.2.2 Question 2: Plant Diseases

Occurrence of pathogenic disease in plants is explained by the concept of disease triangle. Elaborate this statement. The question tested candidates' knowledge and skills of the concept of the disease triangle.

The question was attempted by all 1,094 candidates (100%), of whom 93 (8.50%) scored between 0.0 and 3.0 marks, 343 (31.35%) scored between 3.5 and 5.5 marks, and 658 (60.15%) scored between 6.0 and 9.0 marks. Figure 12 illustrates the distribution of the candidates' scores for this question.

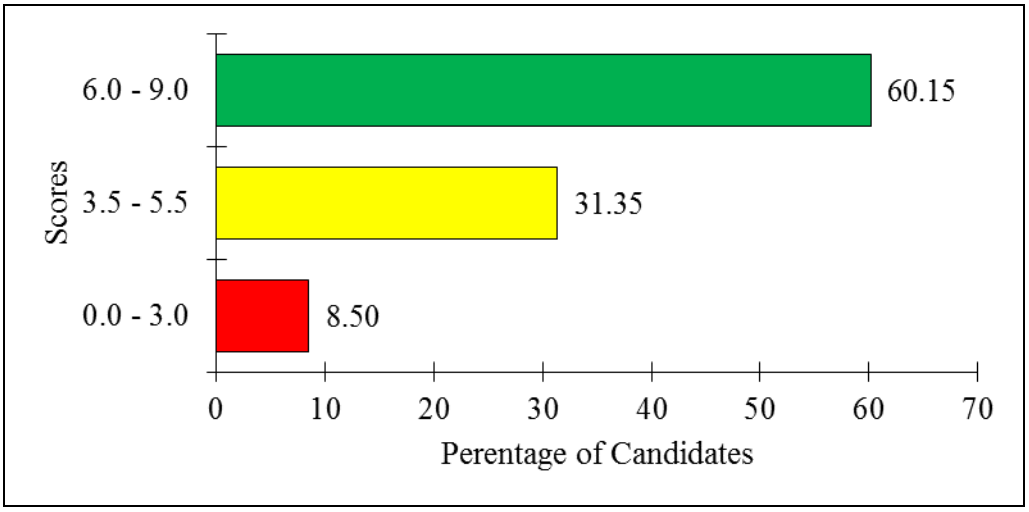
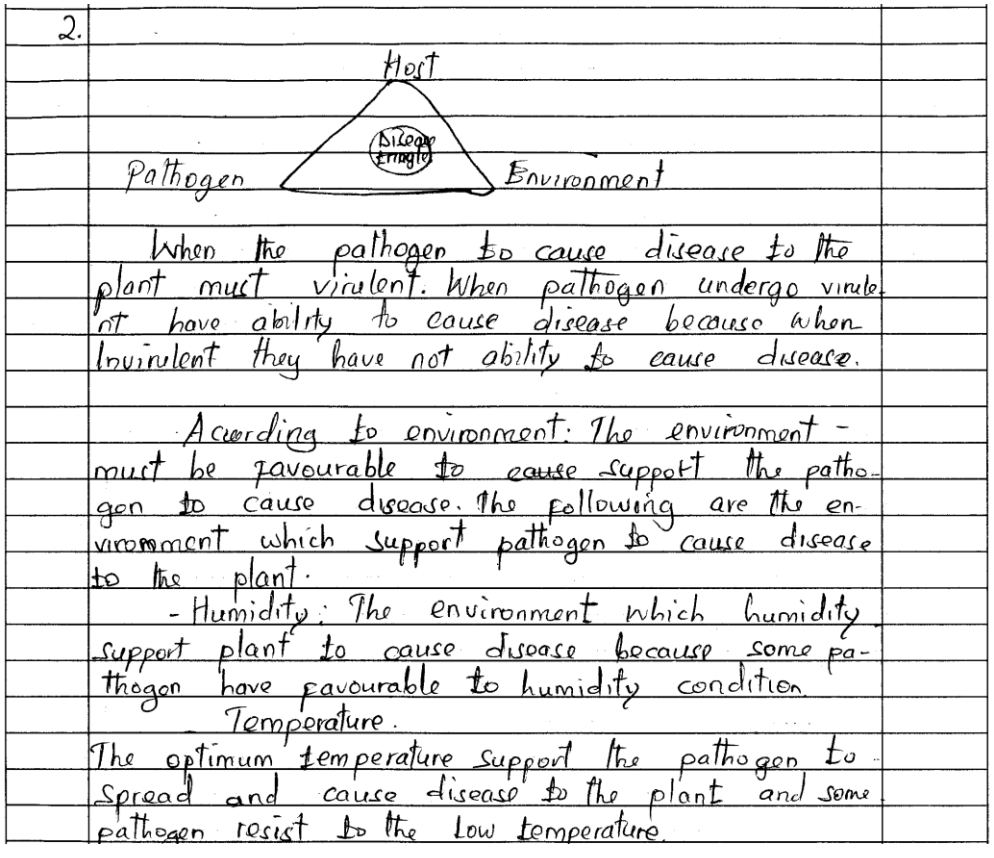


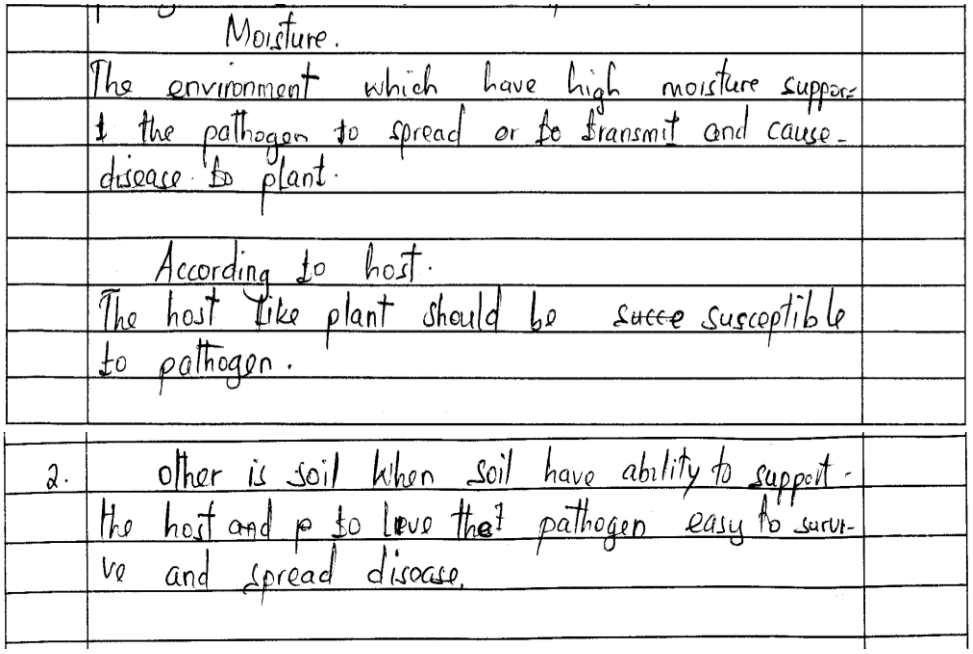
Figure 12**:** *Candidates' Performance on Question 2*

Figure 12 indicates 91.50 per cent of the candidates scored between 3.5 and 9.0 marks, while 8.50 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was good.

Data analysis reveals that 60.15 per cent of the candidates performed well on the question. Most of them were able to elaborate the concept of the disease triangle correctly. They explained that *the disease triangle is a conceptual model for the occurrence of a pathogenic disease in plants as a result of the interaction among a pathogen, a susceptible host plant, and favourable environmental conditions*. Regarding the plant pathogen, they correctly stated that *a plant pathogen is an organism that causes disease in a plant*, and that *organisms causing plant diseases include fungi, bacteria, viruses, and nematodes*. On the susceptible host, candidates explained that *a susceptible*

host is one that is vulnerable to diseases, adding that *poor environmental conditions and environmental stress weaken a plant, making it more susceptible to disease*. Concerning favourable environmental conditions, they identified and elaborated on six key factors: (i) *Temperature– temperatures around 27°C favour the growth and development of pathogens*;(ii) *Moisture– high humidity favours the development of most plant diseases by promoting spore germination, multiplication, penetration of pathogens, and initiation of infection*; (iii) *Soil pH– optimum disease activity occurs at pH values of 5.0 to 5.5, where pathogens are most active*; (iv) *Light– light is a determinant of virulence in plant pathogens, with low light intensity being favourable for pathogen activity*; (v) *Food– plant pathogens require carbon as an energy source and nitrogen as a protein source from plant tissues for their growth*; and (vi) *Wind– wind helps disperse airborne spores over long distances and may create wounds on plants that serve as entry points for pathogens*. The responses justify candidates' understanding of the occurrence of pathogenic diseases in plants. Extract 12.1 presents a sample of correct responses from one of the candidates.




Moisture.
The environment which have high moisture suppor
t the pathogen to spread or to transmit and cause
disease to plant.

According to host.
The host like plant should be ~~succe~~ susceptible
to pathogen.

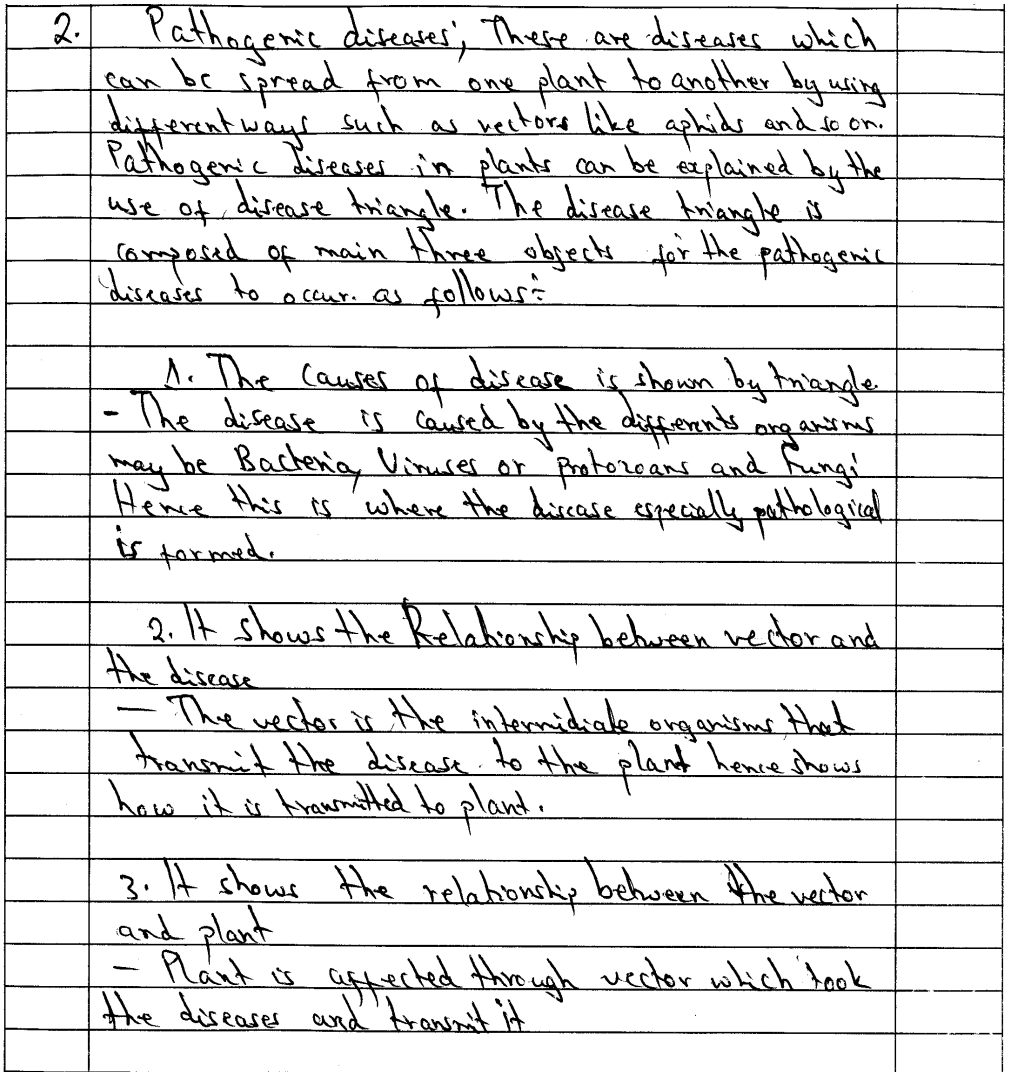
2. other is soil when soil have ability to support
the host and p to leave the pathogen easy to surv
ve and spread disease.

Extract 12.1: A sample of the candidates' correct responses to question 2.

Extract 12.1 presents responses from a candidate who attempted the question correctly, demonstrating good mastery of the subject matter. However, the candidate provided only a partially correct explanation of the environmental factors.

Further analysis shows that 31.35 per cent of the candidates had an average performance. The majority of them provided only partially correct explanations of the three components of the disease triangle, indicating inadequate knowledge and understanding of the concept.

Nevertheless, 8.50 per cent of the candidates had a weak performance on the question. Most of them failed to elaborate the concept of the disease triangle in plants. Some of them incorrectly named the pathogens for plant diseases such as *bacteria, fungi, viruses, nematodes, and protozoa*. Others listed plant diseases such as *wilt, rust, anthracnose, mosaic, rosette, and mildew*. A few candidates went further to explain the *classification of pests based on their occurrence, such as seasonality, occasional, resistance, sporadic, and persistence*. The responses provided signify a lack of subject matter knowledge. A sample of these incorrect responses is shown in Extract 12.2.


2. Pathogenic diseases, These are diseases which can be spread from one plant to another by using different ways such as vectors like aphids and so on. Pathogenic diseases in plants can be explained by the use of disease triangle. The disease triangle is composed of main three objects for the pathogenic diseases to occur. as follows:-

1. The causes of disease is shown by triangle.
- The disease is caused by the different organisms may be Bacteria, Viruses or protozoans and fungi Hence this is where the disease especially pathological is formed.

2. It shows the Relationship between vector and the disease
— The vector is the intermidiate organisms that transmit the disease to the plant hence shows how it is transmitted to plant.

3. It shows the relationship between the vector and plant
— Plant is affected through vector which took the diseases and transmit it

Extract 12.2: A sample of the candidates' incorrect responses to question 2.

Extract 12.2 presents responses from a candidate who demonstrated a lack of subject matter knowledge. Instead of elaborating on the disease triangle, the candidate listed plant pathogens.

2.2.3 Question 3: Crop Pests

It has been the habit of most peasant farmers to control bird pests by scaring them through making noises. Suggest five other ways that can be used to get rid of the bird pests The question assessed candidates' knowledge and skills of pests control.

The question was attempted by all 1,094 candidates (100%), of whom 575 (52.56%) scored between 0.0 and 3.0 marks, 380 (34.73%) scored between 3.5 and 5.5 marks, and 139 (12.71%) scored between 6.0 and 9.0 marks. Figure 13 shows the distribution of the candidates' scores for this question.

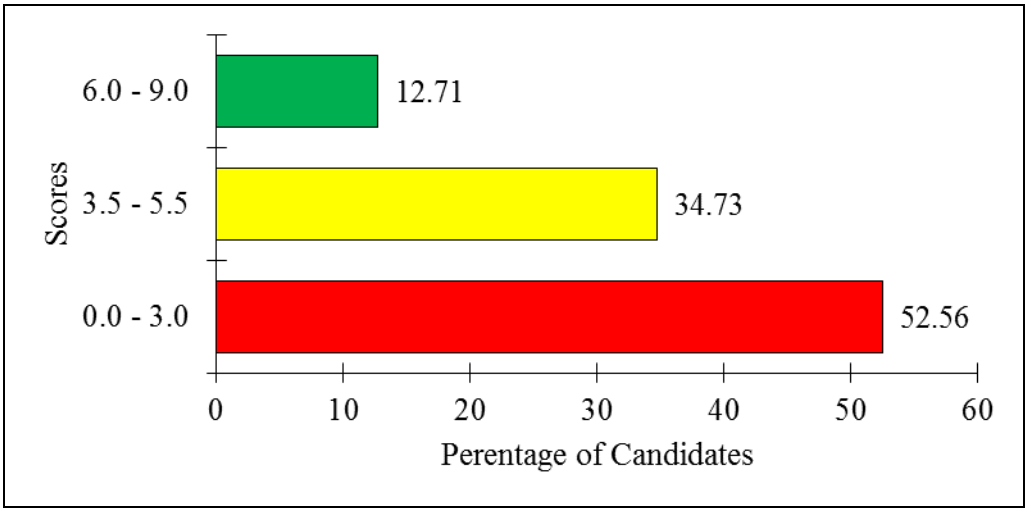
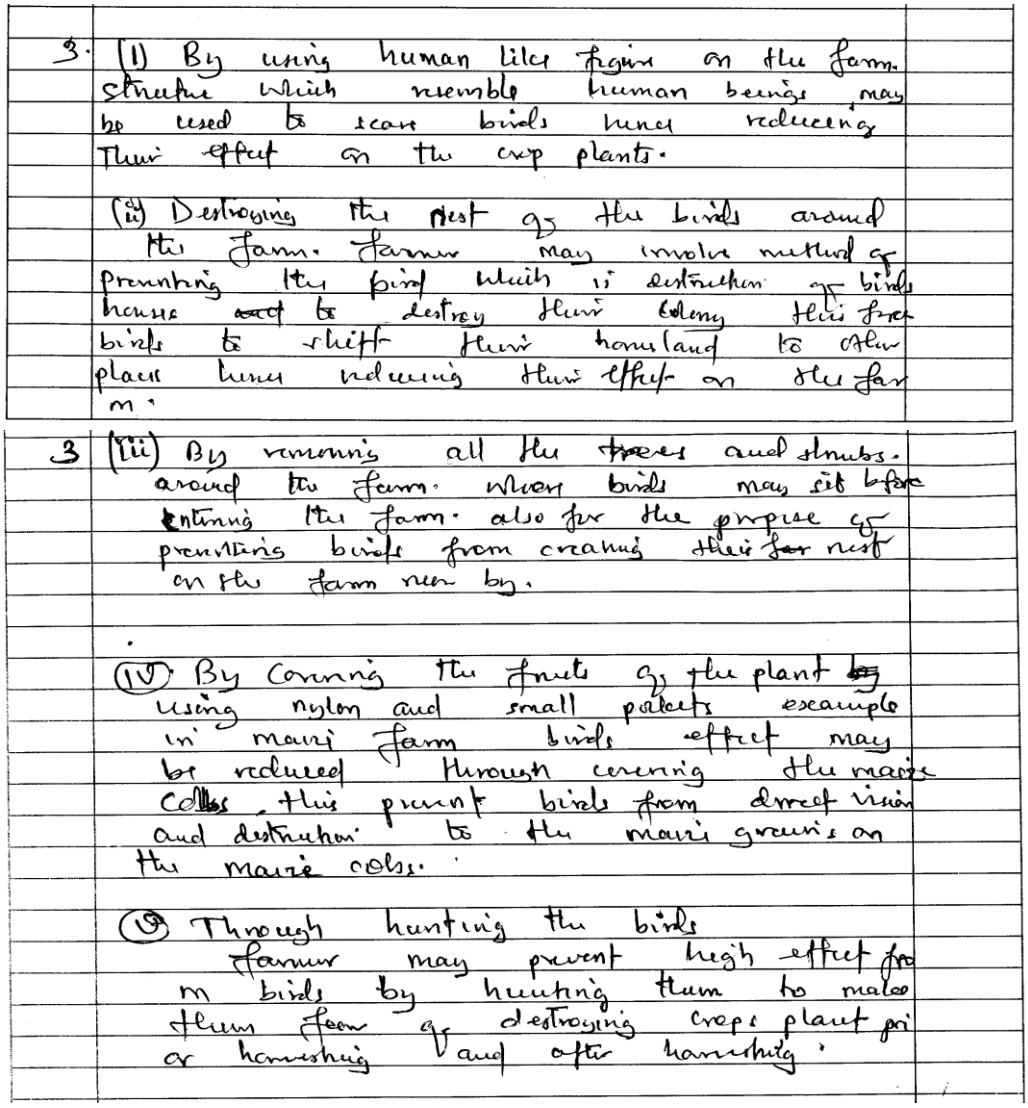


Figure 13: *Candidates' Performance on Question 3*

Figure 13 indicates that 47.44 per cent of the candidates scored between 3.5 and 9.0 marks, while 52.56 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was average.

The statistics show that 12.71 per cent of the candidates had good performance on the question. Most of them were able to suggest alternative methods for controlling bird pests besides scaring them by making noise. The correct responses provided included: *eliminating feeding and watering sources by cleaning gutters to prevent standing water and designing landscapes to avoid puddles and ponds where birds can drink*; *eliminating roosting areas by trimming trees so they do not touch or overhang farm structures*; *removing nests by learning to identify the nests of target bird species and systematically destroying them as soon as they are built or contain eggs*; *using non-toxic repellents such as sticky substances to discourage and reduce bird landing and roosting*; *hunting or trapping using net traps, which are preferred because they allow the release of non-target birds that may be accidentally captured*; and *using natural predators or offering alternative feeding crops to divert bird pests from the main field*. These responses signify a good understanding of bird

pest control methods. Extract 13.1 presents one of the correct responses to the question.

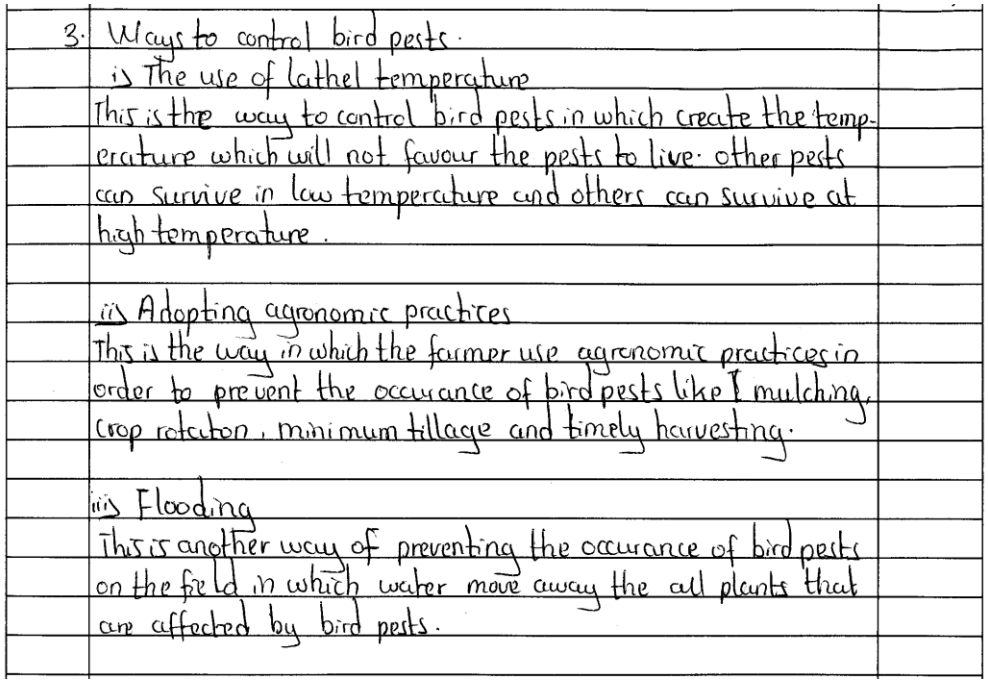


Extract 13.1: A sample of the candidates' correct responses to question 3.

Extract 13.1 presents responses from a candidate who demonstrated good mastery of the subject matter. The candidate provided correct responses in both parts of the question except in part (iv) where the candidates provided inadequate explanations.

A total of 34.73 per cent of the candidates had an average performance on the question. The majority of them suggested only a few methods for controlling bird pests and did not provide all the required points. This indicates that the candidates had a partial understanding of the subject matter.

On the contrary, 52.56 per cent of the candidates performed poorly on the question. Most of them failed to suggest alternative methods of controlling bird pests other than making noise to scare them away. Some candidates provided general pest control methods such as *mechanical, biological, chemical, and cultural methods*, as well as *integrated pest management strategies*, which were not specific to bird pests. Others gave responses related to the use of insecticides, including *using the correct dosage to kill birds*, *applying the most appropriate method for killing birds*, *applying pesticides before birds cause serious damage*, *ensuring the chemical reaches the target birds*, and *disposing of pesticide containers appropriately*. These incorrect responses demonstrate a poor understanding of bird pest control. Extract 13.2 shows a sample of incorrect responses from one of the candidates.



3. Ways to control bird pests.

i) The use of lathel temperature

This is the way to control bird pests in which create the temperature which will not favour the pests to live. other pests can survive in low temperature and others can survive at high temperature.

ii) Adopting agronomic practices

This is the way in which the farmer use agronomic practices in order to prevent the occurance of bird pests like I mulching, crop rotation, minimum tillage and timely harvesting.

iii) Flooding

This is another way of preventing the occurance of bird pests on the field in which water move away the all plants that are affected by bird pests.

iii> Flooding
This is another way of preventing the occurance of bird pests on the field in which water move away the all plants that are affected by bird pests.

iv> Fencing
This is the practice in which bird pests are controlled through fencing to prevent the enterace of bird pests on the field which cause damages of the crops and heance low crops productivity.

v> Poisonous bite
This is the way in which the farmer put the things in the field which is poisonous to the ~~bird~~ bird pests when eated. This will reduce the occurance of bird pest.

Extract 13.2: A sample of the candidates' incorrect responses to question 3.

Extract 13.2 is an example of responses from a candidate who did poorly on the question by providing various incorrect responses to the question.

2.2.4 Question 4: Introduction to Weed Science

It has been noted that village farms are situated in an area which is highly infested with grass weeds, despite of the potential of the soil in producing high yield crops.

(a) *How would you help the farmers in the village to identify the following weeds in the field?*
   (i) *Couch grass*
   (ii) *Star grass*
   (iii) *Kikuyu grass*
   (iv) *Sword grass*
   (v) *Crows-foot grass*

(b) *Suggest two effective control measures of the weeds in (a).*

The question examined the candidates' knowledge and skills of identification and control of weeds. It was attempted by all 1,094 candidates (100%), of whom 1,024 (93.60%) scored between 0.0 and 3.0 marks, 58 (5.30%) scored between 3.5 and 5.5 marks, and 12 (1.10%) scored between 6.0 and 8.0 marks. Figure 14 presents the distribution of the candidates' scores for this question.

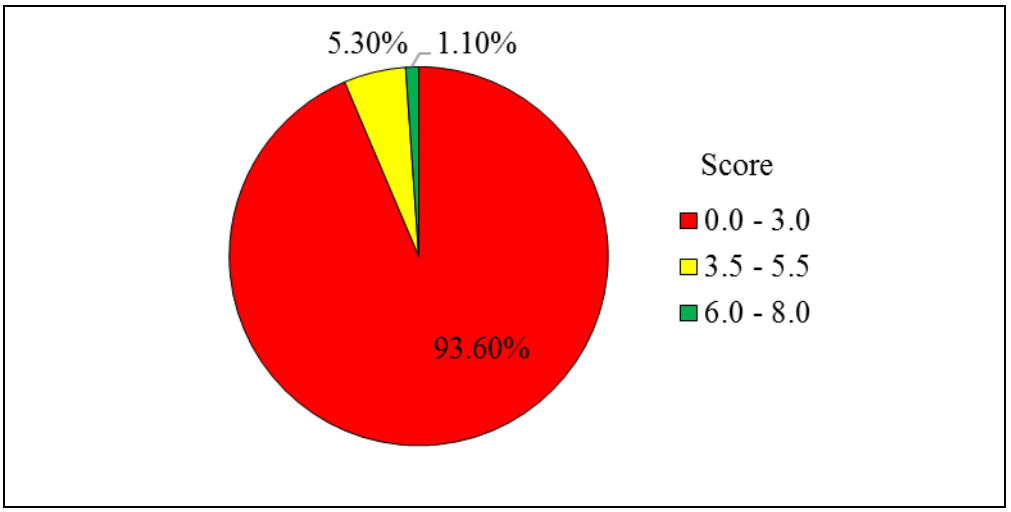


Figure 14: *Candidates' Performance on Question 4*

Figure 14 shows 6.40 per cent of the candidates scored between 3.5 and 8.0 marks, while 93.60 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was weak

The candidates who performed poorly on the question were 93.60 per cent. Most of them answered almost all parts incorrectly. In part (a), they failed to explain how to identify the named grass weeds. The majority provided general negative effects of weeds instead of describing the specific identifying features of each. Examples of such incorrect responses include *competes with crop plants for nutrients*, *competes with crop plants for rooting space*, *it may lower the quality and quantity of crop harvest*. *When it grows on water channels, it may block them*, and *it affects plant tissues*. A few candidates mentioned survival mechanisms of weeds, such as *they possess high seed dispersal mechanisms*, *they are able to grow in harsh conditions*, *they undergo seed dormancy*, *they have the ability to produce a large number of seeds*, and *they have a short life cycle*.

Likewise, in part (b), the candidates failed to suggest effective control measures for the weeds listed in part (a). The majority provided general weed control methods such as *cultural*, *mechanical*, *biological*, and *chemical methods*. Others generally gave various incorrect responses including *the use of grazing animals*, *slashing*, *fallowing*, *sowing of clean seeds*, and *burning*.

A few candidates provided scientific names of weeds instead of suggesting appropriate control measures.

The incorrect responses in both parts indicate that the candidates lacked knowledge and skills in the identification and control of grass weeds. Extract 14.1 is a sample of candidates' incorrect responses to the question.

4(A). Ways of identifying the following weeds in the field.

(i) Couch grass;
- Mean that the Couch grass must disperse fast and produce faster on the field so when ~~to~~ there is unwanted materials on the field and must disperse fast those are couch grass.

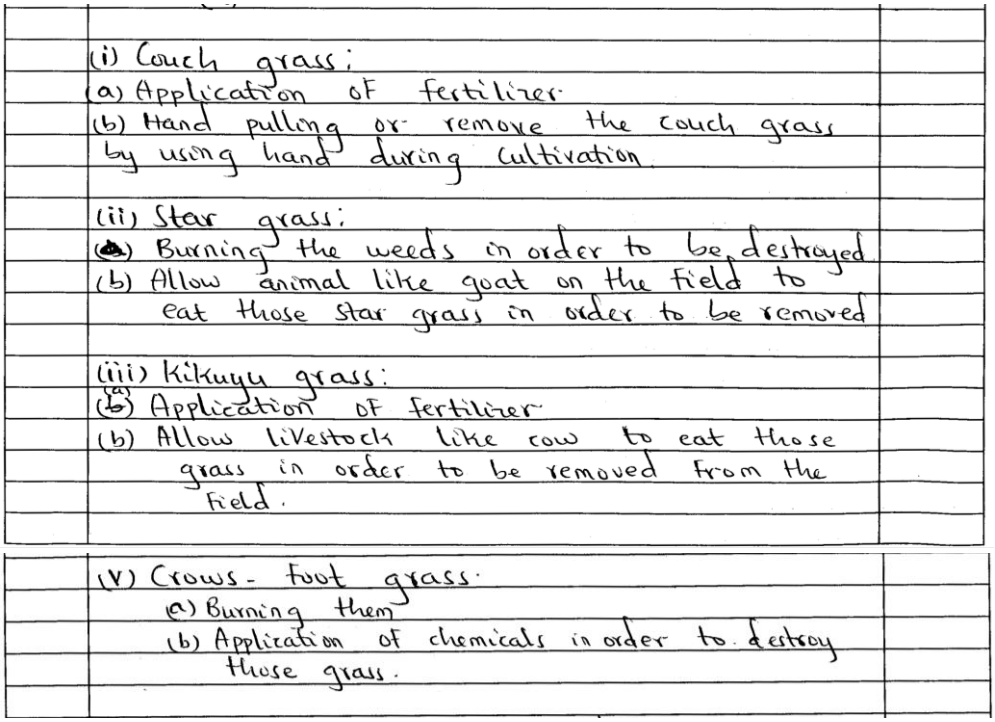
(ii) ~~Straar~~ grass:
- Must produce ~~large~~ fast and grow early so when there is unwanted material on the field and must grow fast those are star grass.

(iii) Kikuyu grass;
- Must produce large number of seed so when there is a grass which produce large number of seed on the field those are kikuyu grass.

4(A) iv) Sword grass;
- Must grow fast
Mean that when there is a grass on the field which must be grow fast those are sword grass.

v) Crows. foot grass;
- Must develop long root
Mean that when there is a grass on the field which must be developed root indicates that there is a crows. foot grass.

(B) Effective control measure of the weeds in (a) above.



Extract 14.1: A sample of the candidates' incorrect responses to question 4.

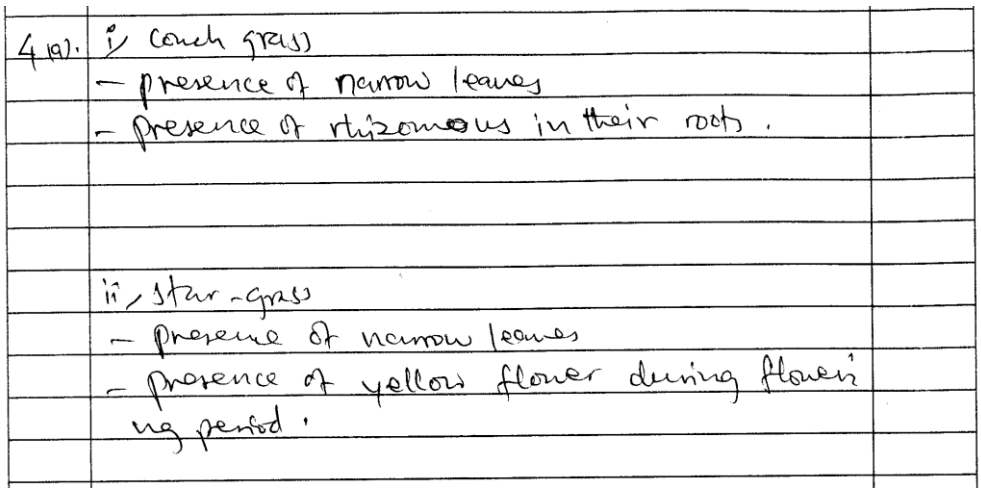
Extract 14.1 illustrates a candidate's responses that did not meet the demands of the question. The candidate provided various incorrect responses in part (a) and incorrect specific control measures for the weeds in part (b).

Additionally, 5.30 per cent of the candidates achieved an average performance on the question. The majority were able to suggest effective control measures for the weeds in part (b). However, they failed to explain how to identify the named grass weeds in part (a), indicating an inadequate understanding of grass weed identification.

However, only 1.10 per cent of the candidates had good performance on the question. The majority provided correct responses to almost all parts. In part (a), they were able to explain how to identify the named grass weeds. The correct responses provided were: Couch grass – *it has fine leaf blades with a rich, dark green colour, is soft to the touch, and has a dense growth habit; it also has tough underground runners and is hard to pull out completely.* Star grass – *it is a stoloniferous perennial grass with thick woody stolons having long internodes that arch above the soil surface, forming dense turfs; the leaf blades are flat and hairy, green to purplish-red, with a star-shaped seed head*

and nearly heart-shaped leaf base. Kikuyu grass – *it is a perennial grass with thick, fleshy stems that root at the nodes; the leaves are light green with pointed tips and flat blades, and both the stems and leaves are slightly hairy.* Sword grass – *it is a perennial grass with densely tufted shoots; the leaves are broad, smooth, and range from green to yellow or purplish, with a white midrib and sharp blade-like edges.* Crow's foot grass – *it is a perennial grass with slender, erect stems; the leaves are broadly linear, succulent, and crisp, with stiff long hairs along the margins, and it has a unique seed head resembling a bird's foot.*

Similarly, in part (b), the candidates were able to suggest effective control measures for the weeds in part (a). The correct responses included: Couch grass – *use of appropriate herbicides to control both overground and underground parts of the weed, regular cultivation, and smothering.* Star grass – *tillage by ploughing, use of appropriate herbicides, and growing competitive crops to suppress weeds.* Kikuyu grass – *hand weeding, removal by digging up patches, spot treatment with appropriate herbicides, and solarisation during hot periods in full sun.* Sword grass – *chemical control using recommended herbicides, heavy grazing, cutting for roughage, and digging to remove underground parts.* Crow's foot grass – *thorough land preparation, hand weeding or pulling when weeds are young, cultivation using farm or mechanical implements, mulching, closer planting, and intercropping.* This indicates that the candidates possessed adequate knowledge and skills in the identification and control of grass weeds. Extract 14.2 presents a sample of the correct responses to the question.



iii/ Kikuyu grass.
- presence of broad leaves
- presence of fruit after flowering.

iv) Sword-grass
- They have broad leaves
- Presence of fruits after flowering

v) Crows-foot grass
- presence of brown seed
- They have broad leaves

4 i) Star grass or couch grass.
(b). - Deep plough
- chemical control. use 2,4-D

ii) Star grass.
- Intensive cultivation.
- Chemical control use 2,4-D ,

iii) Kikuyu grass
- minimum tillage
- Chemical control by use appropriate herbicide

iv) Sword grass
- uprooting
- spraying appropriate herbicides like 2,4-D

v) Crow-foot grass
- chemical control by use herbicide like 2,4-D
- digging them.

Extract 14.2: A sample of the candidates' correct responses to question 4.

Extract 14.2 depicts responses from a candidate who demonstrated good understanding of the subject matter in both parts of the question, except in parts (a) (iii), (iv), and (v), where he/she missed one point in each.

2.2.5 Question 5: Plant Breeding

The plant breeder was observed performing the following procedures for 8 years:

- *First year: used unimproved old variety a base population and grown in a large plant.*
- *Second year: grew the crop from the bulk seed of selected plants in a separate field using standard variety as a check for comparison of performance.*
- *Third to sixth year: evaluated the performance of bulk for yield and adaptation in main yield trials for 3 to 4 years using standard check for comparison.*
- *Seventh and eighth year: released and named the variety in the seventh year and multiplied seeds in the eighth year for distribution.*

(a) *What breeding method did the plant breeder perform?*

(b) *Analyse five merits and four demerits of the breeding method performed by the plant breeder.*

The question assessed candidates' understanding of the methods of plant breeding. It was attempted by all 1,094 candidates (100%), of whom 280 (25.59%) scored between 0.0 and 3.0 marks, 437 (39.95%) scored between 3.5 and 5.5 marks, and 377 (34.46%) scored between 6.0 and 10.0 marks. Figure 15 illustrates the distribution of the candidates' scores for this question.

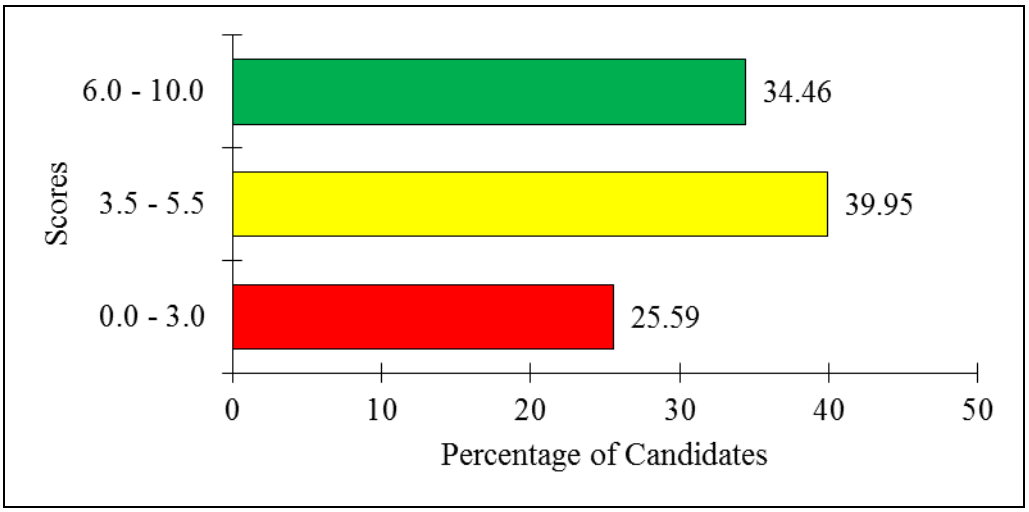


Figure 15: *Candidates' Performance on Question 5*

Figure 15 indicates 74.41 per cent of the candidates scored between 3.5 and 10.0 marks, while 25.59 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was good.

Candidates who performed well on the question were 34.46 per cent. Most of them responded correctly to almost all parts of the question. In part (a), they correctly identified *mass selection* as the appropriate breeding method for the stated procedures. Likewise, in part (b), they were able to analyse both the merits and demerits of the named breeding method. The correct merits provided included: *it is a good method for improving old varieties and landraces, it is used for the purification of improved varieties, mass-selected varieties are more stable in their performance than pure lines, they offer better protection against diseases, mass selection is a simple and quick method of crop improvement,* and *the method is applicable to both self-pollinated and cross-pollinated species*. The demerits given by the candidates included: *selection is based on phenotypic performance, and superior phenotype is not always an indication of superior genotype*; *in cross-pollinated species, there is no control over pollination, as selected plants may be pollinated by both superior and inferior pollen parents, leading to rapid deterioration of the variety*; *in cross-pollinated crops, a large number of plants must be selected for bulking, as using a small sample may result in inbreeding depression*; *varieties developed through mass selection are less uniform than pure lines because mass-selected varieties are mixtures of several pure lines in self-pollinated*

crops and consist of several genotypes in cross-pollinated species; and *in self-pollinated species, pure line selection is more effective than mass selection, as it leads to the isolation of the best line from a mixed or heterogeneous population*. These correct responses reflected a good understanding of the mass selection breeding method. Extract 15.1 presents a sample of the correct responses to the question.

05. a) Mass selection method

b) Merits of mass selection

i) It's an appropriate method of improving old varieties and landraces.

Mass selection method help in improving the old varieties and landraces.

ii) It's applicable in both self-pollinated and cross-pollinated plant species.

The mass selection method can be practiced in both self and cross pollinated plant species.

iii) The varieties developed by mass selection are resistant to diseases (new diseases) than varieties developed by pure selection.

since mass selection is heterozygous hence under resistant

iv) The varieties developed by mass selection have wider adaptation to the environment.

Compared to the varieties produced by pure line selection which have low adaptation due to narrow genetic base.

05 b) v) It's cheap and a simple method of plant improvement.
With reference to other method, mass selection is cheap and simple method of improving plants

Demerits of mass selection
i) The varieties produced by mass selection are less uniform than that being produced by pure line selection method.

ii) The method consider phenotypic performance of the plant. or phenotypic appearance and ~~tag~~ ignore the genotypic performance of the plant.

iii) In cross - pollinated species it's difficult to control over pollination than pollination of many plants which lead to mass production of ~~offspr~~ progeny

iv) In cross - pollinated species large number of plant should be selected in order to avoid inbreeding depression.
selecting large number of plant is difficult to handle.

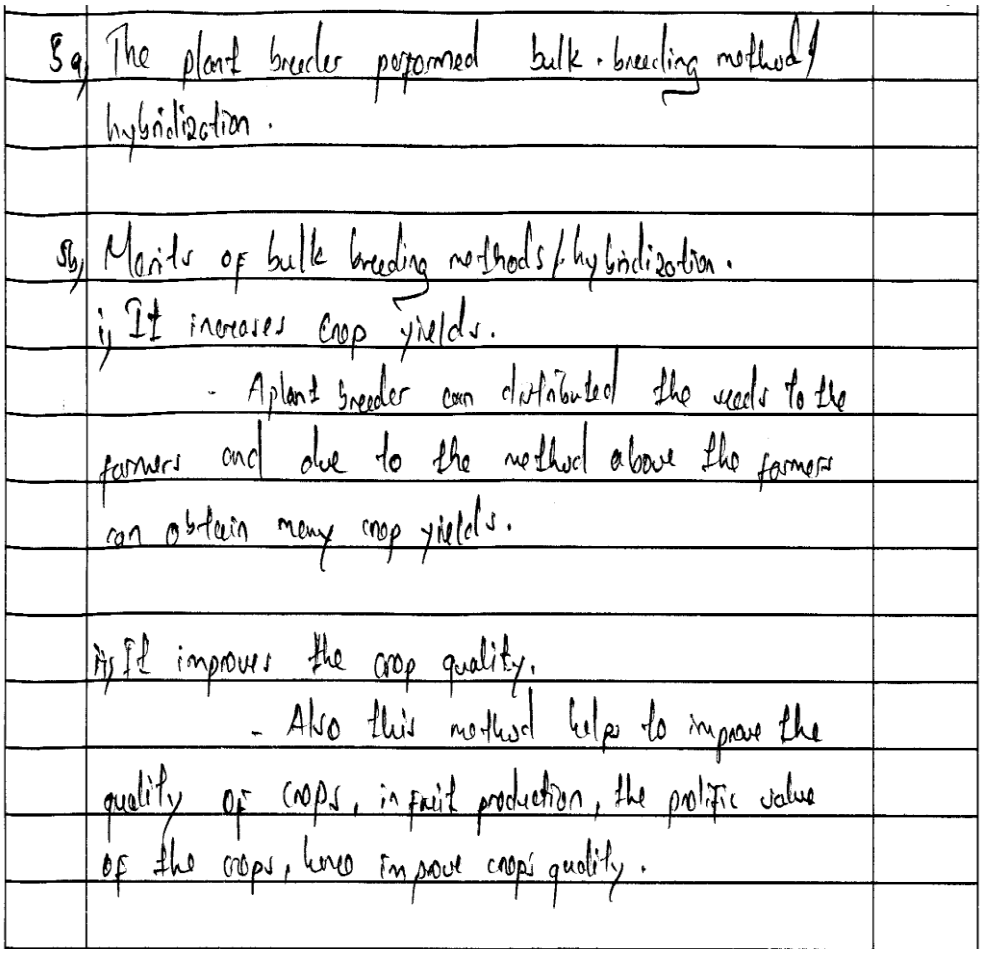
Extract 15.1: A sample of the candidates' correct responses to question 5.

Extract 15.1 shows the responses from a candidate who met the demand of the question by providing correct responses to both parts.

Furthermore, 39.95 per cent of the candidates had an average performance on the question. The majority were able to name the correct breeding method for the stated procedures in part (a); however, they failed to provide all the required merits and demerits of the breeding method in part (b).

On the other hand, 25.59 per cent of the candidates had a weak performance. Most of them provided incorrect responses to almost all parts of the question. In part (a), they failed to name the breeding method which the plant breeder used. Majority of them gave a variety of incorrect responses like *pure line*, *pedigree*, *plant introduction*, *bulk breeding*, and *back crossing*.

Similarly, in part (b), most of the candidates failed to analyse the merits and demerits of mass selection. Instead, they provided the general advantages and disadvantages of plant breeding. Others attempted to discuss the merits and demerits of various breeding methods such as *introduction*, *pedigree selection*, and *hybridisation*. These responses suggest that the candidates lacked competence in the mass selection breeding method. A sample of the incorrect responses to the question is illustrated in Extract 15.2.


8a) The plant breeder performed bulk breeding method/ hybridization.

8b) Merits of bulk breeding methods / hybridization.

i) It increases crop yields.

- A plant breeder can distributed the seeds to the farmers and due to the method above the farmers can obtain many crop yields.

ii) It improves the crop quality.

- Also this method helps to improve the quality of crops, in fruit production, the prolific value of the crops, have improve crops quality.

iii) It improve resistance to crops.

- Through this method the crops obtained plus their seeds will heave high resistance to disease attack, and adverse weather condition hence become resistant.

iv) Enhance wider adaptability.

- Through this proces the plant obtained will have wider adaptability to any environmental changes.

v) Earliness.

- Through the use of this method the plant breeder obtained good seeds with early maturity this means that the reach maturity earlier

5b) Demerits of the breeding method.

i) It may rise of diseases.

ii) It may lead development of new weeds in the farm

iii) It may not be effective.

iv) Change in good characteristic of the old variety.

Extract 15.2: A sample of the candidates' incorrect responses to question 5.

Extract 15.2 indicates a candidate who provided incorrect responses in the question by providing various incorrect responses in both parts.

2.2.6 Question 6: Introduction to Animal Health

(a) *During post-mortem of the dead cattle, soft flattened, leaf-like with a triangular head lobe organisms were found in the bile duct.*

(i) *Identify the organisms found in the bile duct and state three effects that can be caused by that organisms.*

(ii) *Give three measures that can be used to control the organisms found.*

(b) (i) *Argue for or against the statement that "it is possible to eradicate East Coast Fever completely by controlling ticks."*

(ii) *Suggest three control measures of East Coast Fever.*

The question examined candidates' knowledge and skills of livestock parasites and diseases.

The question was attempted by all 1,094 candidates (100%), of whom 101 (9.23%) scored between 0.0 and 3.0 marks, 377 (34.46%) scored between 3.5 and 5.5 marks, and 616 (56.31%) scored between 6.0 and 10.0 marks. Figure 16 shows the distribution of the candidates' scores for this question.

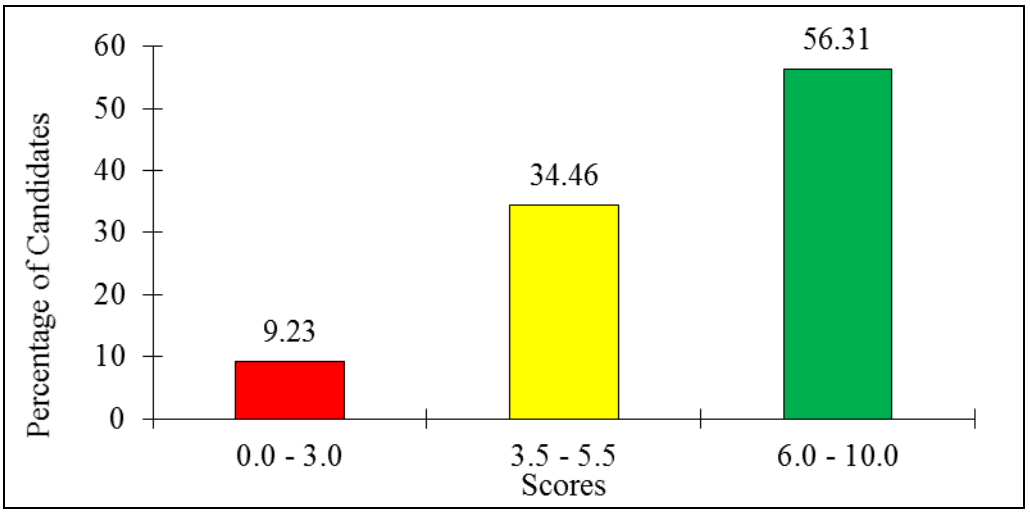
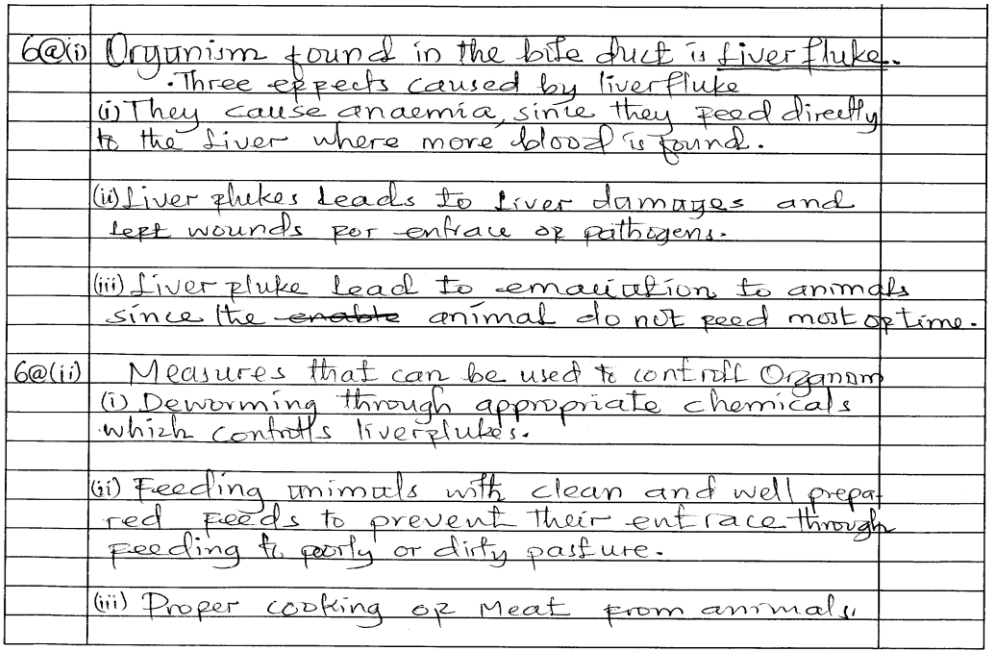


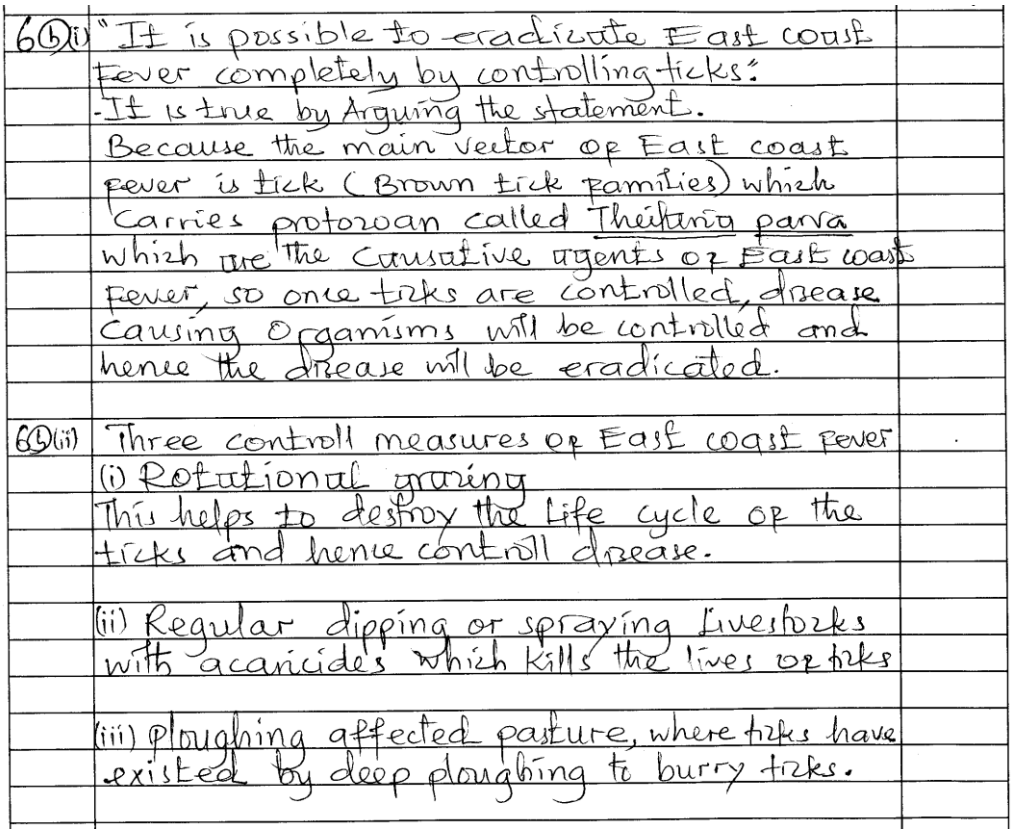
Figure 16: *Candidates' Performance on Question 6*

Figure 16 shows 90.77 per cent of the candidates scored between 3.5 and 10.0 marks, while 9.23 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was good.

Data indicate that 56.31 per cent of the candidates performed well on the question. The majority responded correctly to almost all parts. In part (a)(i), they successfully identified the organism found in the bile duct as *liver flukes* and correctly stated its effects, which included: *abdominal pain*, *jaundice*, *death*, *anaemia*, *recumbency*, *liver damage*, *oedema between the jaws*, and *loss of production*. In part (a)(ii), they correctly provided measures to control *liver flukes*. The appropriate responses included: *grazing management* (e.g., *avoiding high-risk pastures* and *preventing co-grazing of sheep and cattle*), *snail habitat management* (e.g., *fencing off and draining wet areas*), *monitoring for infection* (e.g., *observing abattoir condemnations*), *routine use of suitable anthelmintic drugs*, and *feeding livestock with pyrethrum marc* to help control liver flukes.

Similarly, in part (b)(i), the candidates effectively supported the statement that it is possible to eradicate East Coast Fever completely by *controlling ticks*. They correctly explained that *ticks are vectors of the parasitic protozoan Theileria parva*, the *causative agent of East Coast Fever*. In part (b)(ii), they correctly suggested control measures for *East Coast Fever*, including *restriction of cattle movement*, *vector control*, *treatment*, and *immunisation*. The responses provided by the candidates demonstrate a good understanding of both *liver flukes* and *East Coast Fever*. Extract 16.1 presents a sample of correct responses to the question.


6@(i) Organism found in the bile duct is liver fluke.
·Three effects caused by liver fluke
(i) They cause anaemia, since they feed directly to the liver where more blood is found.
(ii) Liver flukes leads to liver damages and left wounds for entrace of pathogens.
(iii) Liver fluke lead to emaciation to animals since the enable animal do not feed most of time.
6@(ii) Measures that can be used to controll Organism
(i) Deworming through appropriate chemicals which controlls liverflukes.
(ii) Feeding animals with clean and well prepared feeds to prevent their entrace through feeding to poorly or dirty pasture.
(iii) Proper cooking of Meat from animals.



Extract 16.1: A sample of the candidates' correct responses to question 6.

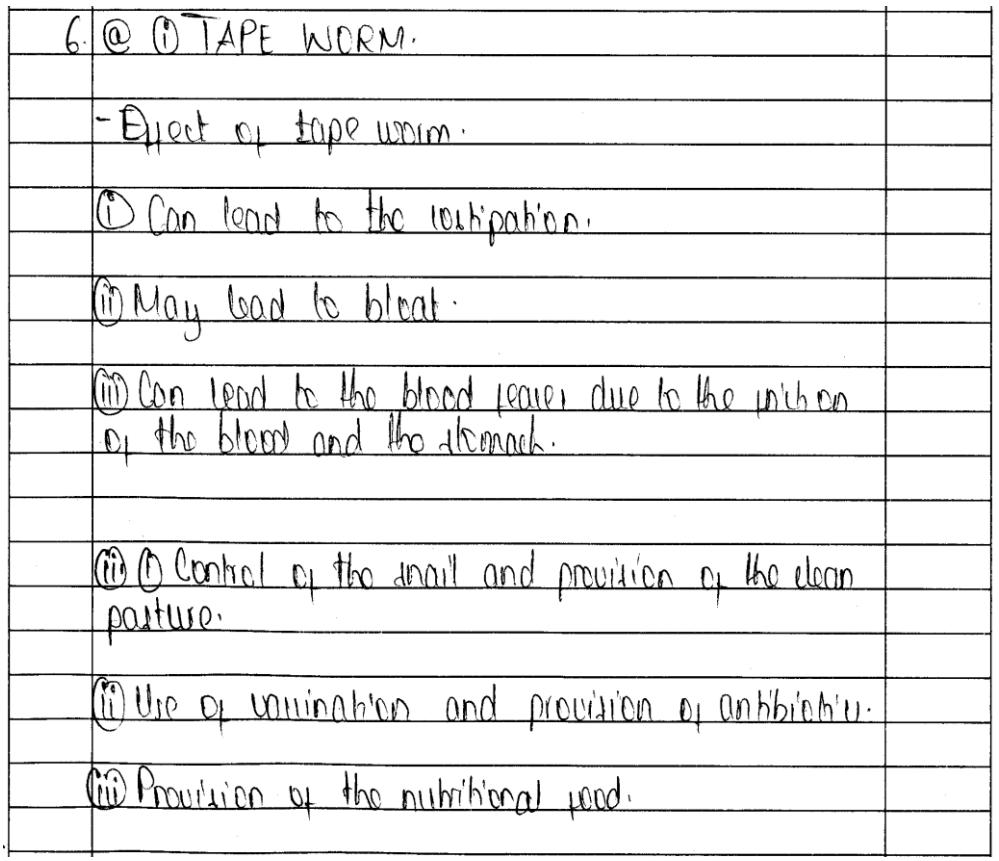
Extract 16.1 presents responses from a candidate who exhibited sufficient knowledge of the subject matter.

Additionally, data show that 34.46 per cent of the candidates achieved an average performance. The majority were able to correctly identify the organism found in the bile duct in part (a)(i), but failed to provide the correct effects caused by *liver flukes*. In part (a)(ii), they were unable to suggest appropriate control measures for *liver flukes*. However, in part (b)(i), they correctly supported the given statement, and in part (b)(ii), they accurately suggested control measures for *East Coast Fever*. This performance indicates that the candidates had inadequate understanding of *liver flukes.*

On the contrary, 9.23 per cent of the candidates had a weak performance on the question. Most of them provided incorrect responses to almost all parts. In part (a)(i), they failed to identify the organism found in the bile duct.

Instead, they provided names of other organisms such as *tapeworms*, *roundworms*, *amoeba*, *euglena*, and *bacteria*. Similarly, the candidates failed to state the effects caused by liver flukes. Examples of the incorrect responses given include *laying eggs*, *vomiting*, *nausea*, *dizziness*, *lameness*, and *coughing*. In part (a)(ii), they failed to provide appropriate control measures for liver flukes, giving incorrect responses such as *vaccination*, *cleaning cattle houses*, *slaughtering the affected animal*, *dipping*, and *proper feeding*.

Likewise, in part (b)(i), they failed to argue for the statement and instead argued against it. In part (b)(ii), they were unable to provide the correct control measures for East Coast Fever. The incorrect responses included *deworming*, *drenching*, *slaughtering*, *culling*, and *proper feeding*. These responses from the candidates demonstrate a lack of knowledge and skills regarding liver flukes and East Coast Fever. Extract 16.2 presents a sample of the incorrect responses from one of the candidates.


6. @ (i) TAPE WORM.

- Effect of tape worm.

(i) Can lead to the constipation.

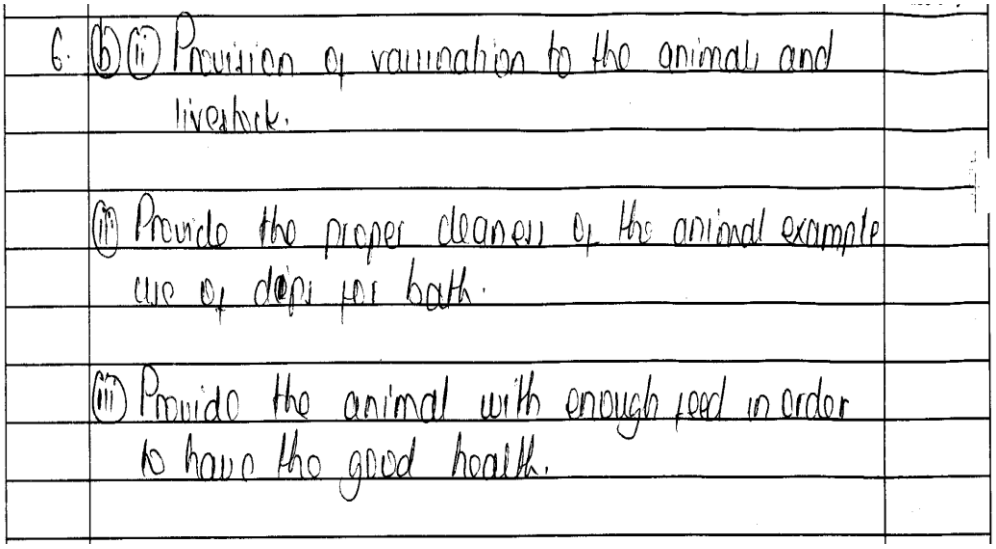
(ii) May lead to bleat.

(iii) Can lead to the blood leaves due to the poison of the blood and the stomach.

(iii) (i) Control of the snail and provision of the clean pasture.

(ii) Use of vaccination and provision of antibiotic.

(iii) Provision of the nutritional food.



Extract 16.2: A sample of the candidates' incorrect responses to question 6.

Extract 16.2 shows responses from a candidate who failed to provide correct responses in all parts indicating a lack of subject matter knowledge.

2.2.7 Question 7: Introduction to Animal Nutrition

(a) *How would you differentiate digestion in the stomach of swine and sheep?*

(b) *The school that keeps pigs, feeds the animals with stiff maize porridge and beans from students' food remains.*

(i) *Which nutrients are the animals basically being given*?

(ii) *Educate the piggery unit attendants in the school on the general classes of nutrients required by the animals*?

The question examined the candidates' knowledge and skills of nutrition in ruminants and non-ruminants.

The question was attempted by all 1,094 candidates (100%), of whom 483 (44.15%) scored between 0.0 and 3.0 marks, 425 (38.85%) scored between 3.5 and 5.5 marks, and 186 (17.00%) scored between 6.0 and 10.0 marks. Figure 17 presents the distribution of the candidates' scores for this question.

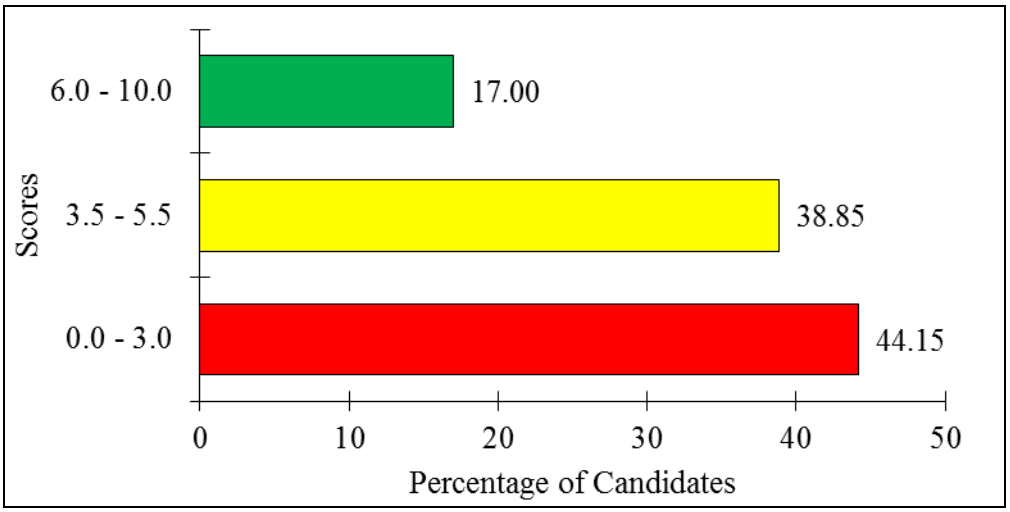
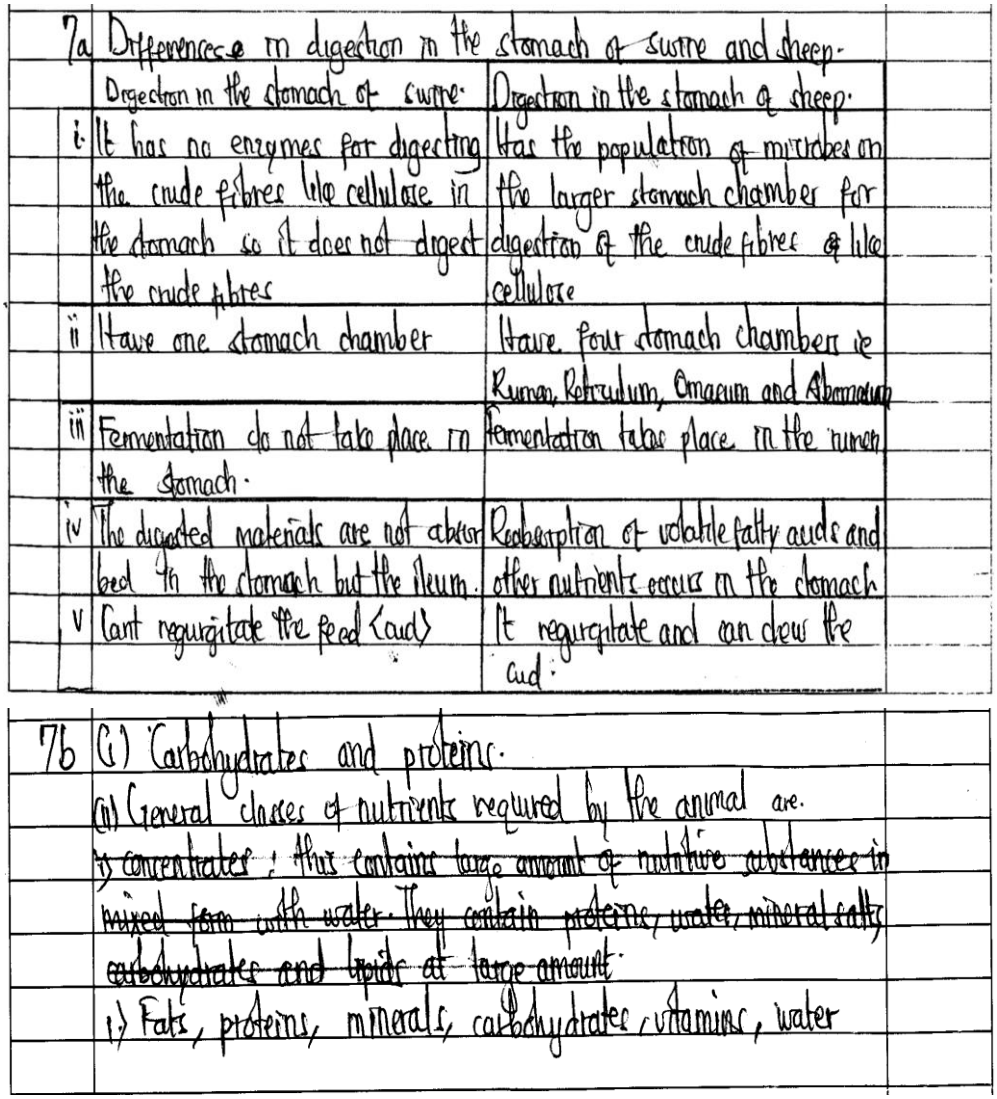


Figure 17: *Candidates' Performance on Question 7*

As shown in Figure 17, 55.85 per cent of the candidates scored between 3.5 and 10.0 marks, while 44.15 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was average.

The statistics show that 17.00 per cent of the candidates performed well on the question. The majority of them responded well to both parts. In part (a), they successfully differentiated digestion in the stomachs of swine and sheep as follows: *Swine have a simple (monogastric) stomach with one compartment*, whereas *sheep have a complex (ruminant) stomach with four compartments: the rumen, reticulum, omasum, and abomasum. In swine, digestion is mainly enzymatic and acidic, similar to humans*, while *in sheep, digestion begins with microbial fermentation in the rumen, followed by enzymatic digestion in the abomasum. Swine experience little to no fermentation in the stomach,* whereas *sheep undergo extensive microbial fermentation in the rumen, Swine are poor at digesting fibre and have a limited ability to utilise roughage*, while *sheep efficiently digest fibre due to the presence of microbes in the rumen. Swine have few microbes in the stomach*, whereas *sheep have millions of microbes (bacteria, protozoa, and fungi) in the rumen that aid in breaking down plant materials. Swine obtain energy mainly from sugars and starches digested in the small intestine*, whereas *sheep derive energy primarily from volatile fatty acids produced by microbes during fermentation.*

Similarly, in part (b)(i), the candidates correctly identified the nutrients mainly provided to animals as *carbohydrates* and *proteins*. In part (b)(ii), they successfully educated piggery unit attendants on the general classes of nutrients required by animals. The correct responses included *water*, *carbohydrates*, *fats*, *proteins (amino acids)*, *minerals*, and *vitamins*. The correct responses given by the candidates demonstrate a good mastery of the subject matter. Extract 17.1 presents a sample of the correct responses to the question.



Extract 17.1: A sample of' the candidates' correct responses to question 7.

Extract 17.1 presents correct responses to the question, in which the candidate accurately differentiated the digestive systems of farm animals in part (a) and identified the classes of feed nutrients for pigs in part (b).

Candidates who had an average performance accounted for 38.85 per cent. Most of them were able to mention the types of nutrients given to pigs and the classes of nutrients required by pigs in parts (b)(i) and (b)(ii), respectively. However, they faced difficulties in differentiating the digestive systems of swine and sheep in part (a), indicating limited understanding of the digestive systems of ruminants and non-ruminants.

On the other hand, 44.15 per cent of the candidates had a weak performance. The majority provided incorrect responses to almost every part of the question. In part (a), most of them failed to differentiate the digestion in the stomachs of swine and sheep. Instead, they reversed the characteristics of the two species, providing, for example, *swine's stomach has four chambers while a sheep has one*; swine *chew the cud while sheep do not; fermentation occurs in swine whereas enzyme digestion occurs in sheep*; and *that digestion in swine takes place in the small intestine* while *in sheep it occurs in the large intestine*. Such responses reveal confusion between ruminant and non-ruminant digestive systems.

Similarly, in part (b)(i), the candidates were unable to name the nutrients supplied to the animals, offering incorrect items such as *feedstuffs*, *iron*, *anti-nutritional feeds*, *legumes*, *vitamins*, and *minerals*. In part (b)(ii), they misclassified nutrients by citing general feed categories such as *roughages*, *concentrates*, and *succulent feeds* instead of the required classes of nutrients. These responses demonstrate limited knowledge and skills regarding farm-animal digestive systems and livestock feed classification. Extract 17.2 presents a sample of the incorrect responses from one of the candidates.

07 b) i) High nutritive value Foods.

ii) Roughages; Are the Food which have rich in protein materials so I advice school to give the animals Foods which contain roughages in excess amount.

iii) concentrates; Are the Foods which have high fibre contents.

(iii) succulents; Are the Foods which have high water contents

07 a) -Digestion in the stomach of swine. swine they have Four hearth chamber which is rumen, reticulum omasum and abomasum so in swine digestion will take easly because swine they posses those Four chambers While sheep they possess two chamber which is rumen and reticulum so digestion will take place slowly in animals like sheep.

-> sheep are ruminant animals, After eating the Food in time of resting they try to make rumination in-order digestion to take place because they posses two chambers While in swine, This is non ruminant animal even taken the Food digestion will take place easly because they dont undergo rumination of that Food due to Four chambers well posses.

Extract 17.2: A sample of the candidates' incorrect responses to question 7.

Extract 17.2 presents responses from a candidate who did poorly on the question. The candidate provided incorrect responses in all parts.

2.2.8 Question 8: Pasture Agronomy

(a) *The school established alfalfa as pastures to feed the cattle.*

(i) *What is the nutritional status of the pastures*?

(ii) *Advice the school on the proper composition of pastures to be established for farm animals. Give three reasons to support your answer.*

(b) *Assume the school has established suitable pastures for the farm animals. Giving four reasons, suggest the best grazing methods to be employed in the pastures.*

The question assessed the candidates' understanding of the Pastures. It was attempted by all 1,094 candidates (100%), of whom 676 (61.79%) scored between 0.0 and 3.0 marks, 323 (29.53%) scored between 3.5 and 5.5 marks, and 95 (8.68%) scored between 6.0 and 9.0 marks. Figure 18 shows the distribution of the candidates' scores for this question.

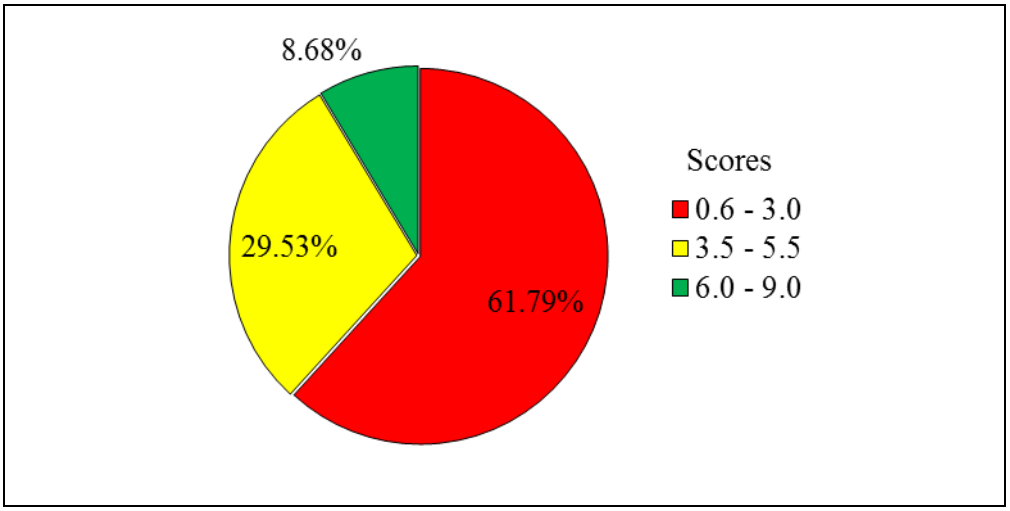


Figure 18: *Candidates' Performance on Question 8*

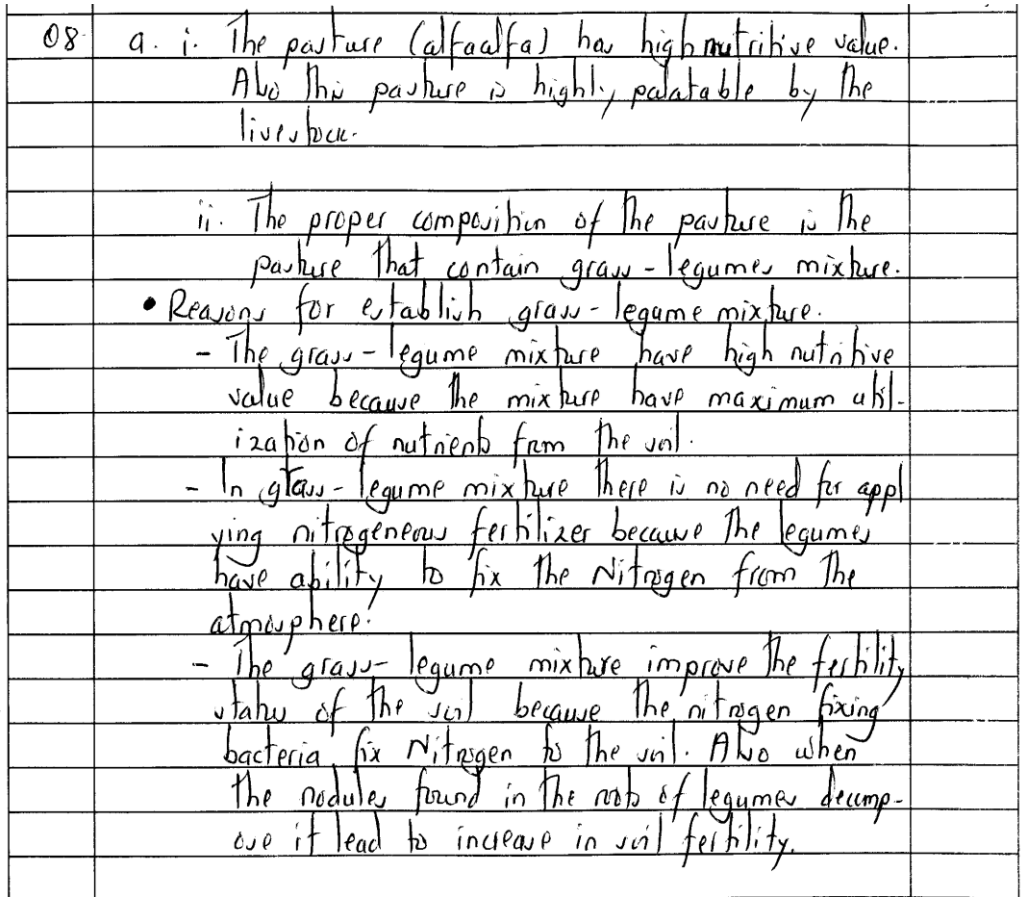
Figure 18 indicates 38.21 per cent of the candidates scored between 3.5 and 9.0 marks, while 61.79 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was average.

The statistics show that, 8.68 per cent of the candidates performed well on the question. Most of them provided correct responses to nearly all parts of the question. In part (a)(i), they correctly stated the nutritional status of alfalfa as *a leguminous pasture characterised by abundant leafy material, and is rich in protein, energy, and micronutrients, making it highly nutritious for livestock.*

Similarly, in part (a)(ii), the candidates effectively advised the school on the proper composition of pastures to be established for farm animals. The correct recommendation was *a mixture of grasses and legumes*. The supporting reasons given included: *extending the growing season of the pasture,*

improving forage quality, reducing the need for nitrogen fertilisers due to nitrogen fixation by legumes, enhancing adaptability to a wider range of environmental conditions, and *increasing the flexibility of pasture management*.

Moreover, in part (b), the candidates correctly suggested *rotational grazing* as the best grazing method to be used on the pastures. Their justifications were well-articulated and included benefits such as *improved soil fertility, increased forage production, higher quality forage, controlled utilisation of forage, reduced forage wastage, better drought management, consistent monitoring of animals, extended grazing periods,* and *effective control of weeds and parasites*, all of which contribute to enhanced animal performance. These responses reflect a strong understanding of pasture management and its importance in livestock production. Extract 18.1 presents a sample of the correct responses provided by one of the candidates.



08 a. i. The pasture (alfaalfa) has high nutritive value. Also the pasture is highly palatable by the livestock.

ii. The proper composition of the pasture is the pasture that contain grass - legumes mixture.

- Reasons for establish grass - legume mixture.
  - The grass - legume mixture have high nutritive value because the mixture have maximum utilization of nutrients from the soil.
  - In grass - legume mixture there is no need for applying nitrogeneous fertilizer because the legumes have ability to fix the Nitrogen from the atmosphere.
  - The grass - legume mixture improve the fertility status of the soil because the nitrogen fixing bacteria fix Nitrogen to the soil. Also when the nodules found in the roots of legumes decompose it lead to increase in soil fertility.

08 a. i. The pasture (alfaalfa) has high nutritive value. Also this pasture is highly palatable by the livestock.

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  - The grass - legume mixture improve the fertility status of the soil because the nitrogen fixing bacteria fix Nitrogen to the soil. Also when the nodules found in the roots of legumes decompose it lead to increase in soil fertility.

b.

(b). The best grazing method to be employed in the pastures is rotational grazing.

Reasons of rotational grazing.

- It help to destroy the life cycle of the parasite such as ticks and other.
- It allow the time for the pasture to re-grow again
- It ensure maximum utilization of the pasture.
- It help to avoid soil erosion which caused by continuous grazing.

Extract 18.1: A sample of the candidates' correct responses to question 8.

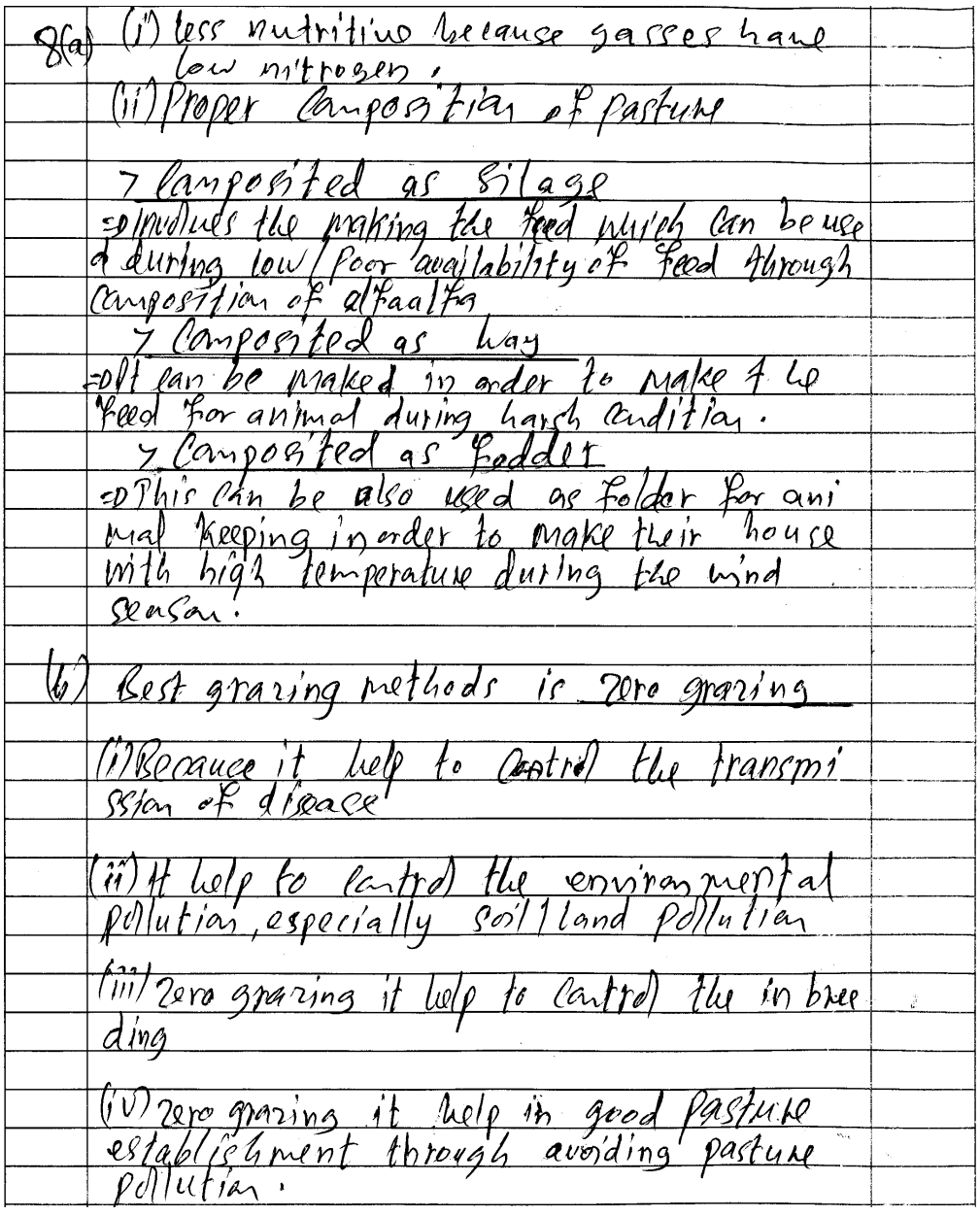
Extract 18.1 indicates responses from a candidate who provided correct responses to both parts of the question, showing a good understanding of pastures. However, in part (a) (i), the candidate provided incorrect response.

Candidates who achieved an average performance accounted for 29.53 per cent. In part (a)(i), most of them were able to correctly state the nutritional status of the pasture. However, in part (a)(ii), they were unable to adequately advise the school on the proper composition of pastures to be established for farm animals. Despite this, some candidates managed to provide a few correct supporting reasons, such as improved forage quality or nitrogen fixation by legumes. In part (b), the candidates failed to suggest a suitable grazing method for the established pastures. Nevertheless, a few of them were able to mention isolated benefits, such as improved animal performance or reduced forage wastage, although they did not elaborate further or provide comprehensive explanations. These partially correct but limited responses resulted in moderate scores for the candidates.

However, 61.79 per cent of the candidates had a weak performance. The majority provided incorrect responses to almost all parts of the question. In part (a)(i), the candidates failed to state the nutritional status of the pastures. Instead, they provided a range of incorrect responses such as *legumes*, *artificial pastures, pure stand pasture, molasses, natural pastures, high fibre contents,* and *high palatability*. These responses reflect a lack of knowledge and skills regarding the nutritional aspects of pasture crops.

In part (a)(ii), the candidates were unable to advise the school, with reasons, on the proper composition of pasture to be established for farm animals. Most of them confused pasture composition with livestock feed types, providing examples such as *energy concentrates*, *protein concentrates*, *vitamin concentrates*, and *mineral concentrates*. These responses indicate a failure to understand the requirements of the question.

Similarly, in part (b), the candidates failed to suggest the best grazing method to be used on the pastures along with valid reasons. Instead, many gave incorrect responses such as *zero/indoor/stall grazing*, *continuous grazing*, *free range grazing*, and *semi-intensive grazing system*. These responses demonstrate limited understanding of appropriate grazing systems for pasture management. These responses overall reflect a poor grasp of concepts related to pasture nutrition, establishment, and grazing methods. Extract 18.2 shows a sample of the incorrect responses provided by one of the candidates.


8(a) (i) less nutritive because gasses have low nitrogen.
(ii) Proper Composition of pasture
7 Composited as silage
=> includes the making the feed which can be used during low/poor availability of feed through Composition of alfaalfa
7 Composited as hay
=> It can be maked in order to make the feed for animal during harsh condition.
7 Composited as fodder
=> This can be also used as folder for animal keeping in order to make their house with high temperature during the wind season.
(b) Best grazing methods is zero grazing
(i) Because it help to control the transmission of disease
(ii) It help to control the environmental pollution, especially soil/land pollution
(iii) zero grazing it help to control the in breeding
(iv) zero grazing it help in good pasture establishment through avoiding pasture pollution.

Extract 18.2: A sample of the candidates' incorrect responses to question 8.

Extract 18.2 illustrates responses from a candidate who attempted the question incorrectly by providing various incorrect responses in all parts.

2.2.9 Question 9: Livestock Reproduction, Breeding, and Improvement

(a) *A cow was seen facing difficulties during parturition due to excessive calf size. Briefly describe the assistance you would give to make the process successful. Give five points.*

(b) *Analyse five disadvantages of not adopting artificial insemination in a piggery farm.*

The question assessed the candidates' knowledge and skills of livestock reproduction. It was attempted by all 1,094 candidates (100%), of whom 585 (53.47%) scored between 0.0 and 3.0 marks, 432 (39.49%) scored between 3.5 and 5.5 marks, and 77 (7.04%) scored between 6.0 and 8.0 marks. Figure 19 shows the distribution of the candidates' scores for this question.

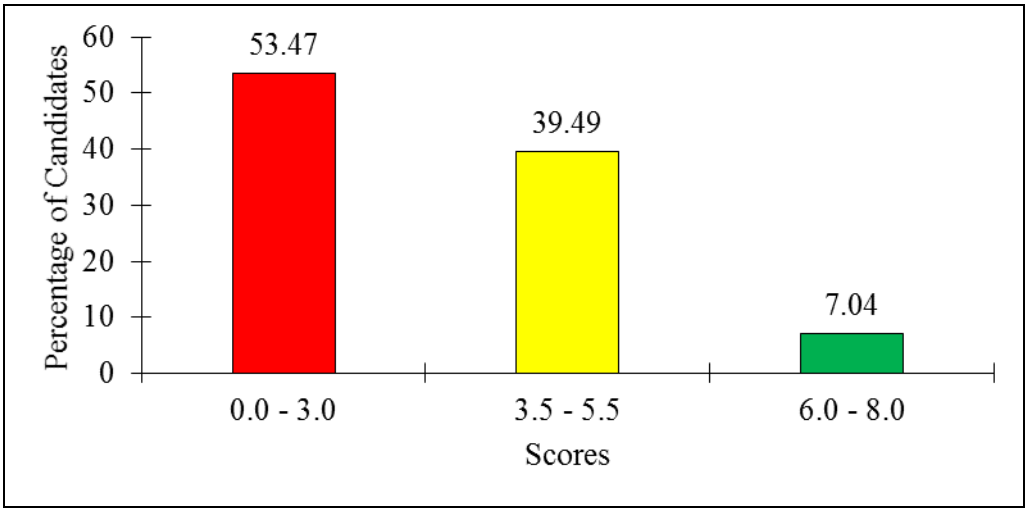


Figure 19: *Candidates' Performance on Question 9*

Figure 19 shows 46.53 per cent of the candidates scored between 3.5 and 8.0 marks, while 53.47 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was average.

The statistics show that,7.04 per cent of the candidates performed well on the question. The majority provided correct responses to nearly all parts of the question. In part (a), the candidates correctly described the appropriate assistance to be provided during the calving process. They demonstrated comprehensive knowledge of the procedures necessary for ensuring a successful delivery. For example, they provided correct responses such as *applying lubricants liberally and frequently during assistance*. This measure *helps reduce friction and trauma to the birth canal, allows the calf to slide more easily, and minimizes the chances of vaginal or uterine injury*.

Furthermore, the candidates recommended *alternating the pull on each leg during delivery*. This is pulling one leg slightly or using a seesaw motion, which facilitates the passage of the shoulders one at a time through the cow's pelvis, which is often too narrow for both shoulders to pass simultaneously. This method helps prevent shoulder lock and reduces pressure on the pelvis and soft tissues.

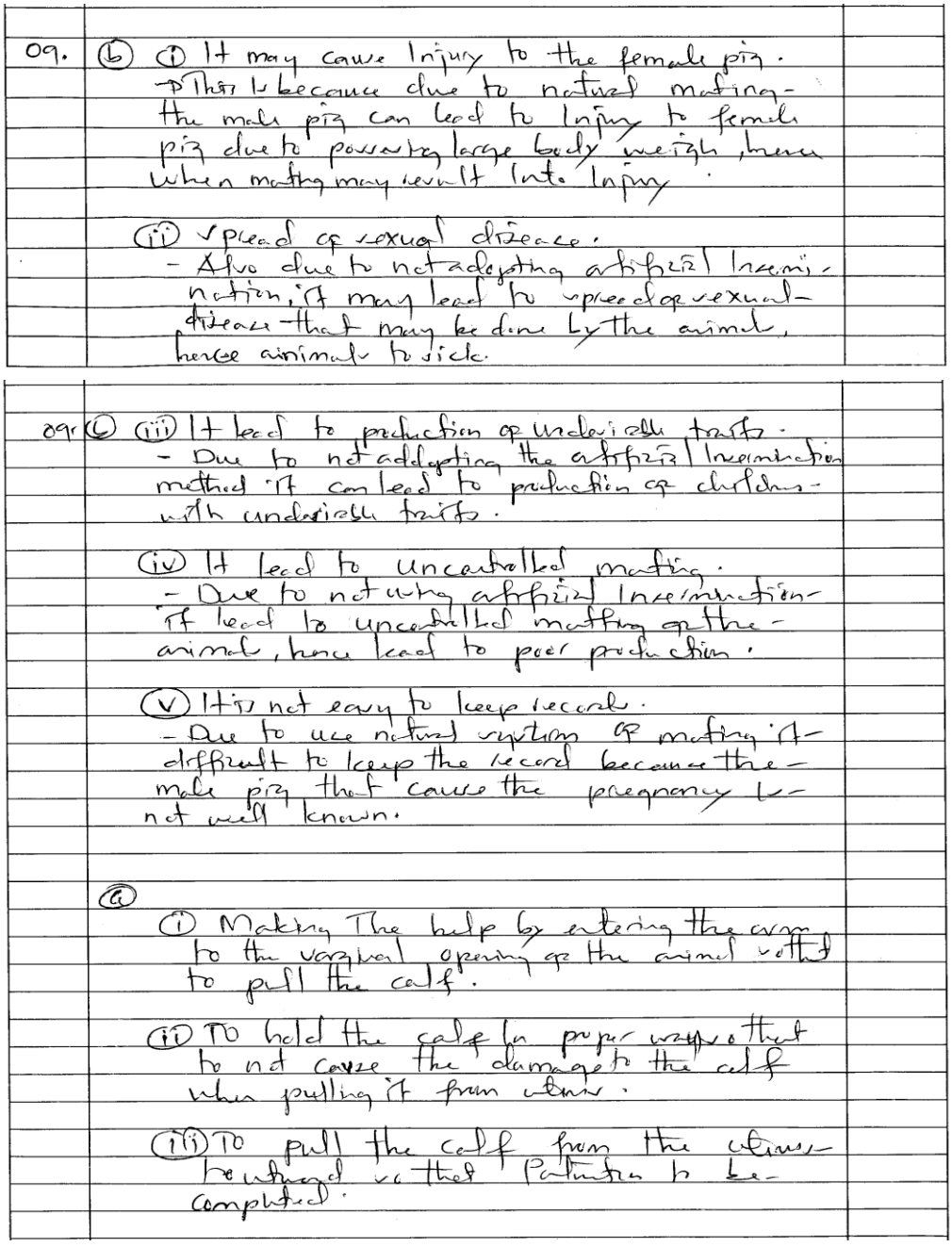
Another correct response was the need to *extend both front legs fully before applying traction*. This ensures the calf is in the correct delivery position, avoids obstruction caused by bent or retained limbs, and enables proper movement of the shoulder and chest through the birth canal.

Moreover, the candidates recommended *applying controlled traction to pull the calf.* They emphasized the use of gradual and gentle force by hand or a calf jack (only if trained) to overcome resistance, especially at the shoulders or hips, and to ensure steady progress during contractions.

Lastly, the candidates described the technique of *delivering the calf by walking it out.* This approach mimics the natural birth movement, easing the calf gradually through the pelvis, minimizing trauma to both the cow and the calf, and helping prevent dystocia-related injuries. This shows that the candidates were knowledgeable and skilled of the calving process.

Similarly, in part (b), the candidates competently analysed the *disadvantages of not adopting artificial insemination (AI) in a piggery farm*. They identified several drawbacks, including *the need for a higher level of management, increased sow and boar injuries, less predictable breeding dates, and the risk of boar overuse*. Other limitations mentioned were *lower conception rates, limited genetic improvement, increased risk of disease transmission, higher costs associated with keeping breeding males, potential inbreeding,* and *the inability to use old, sick, or disabled males as sires*.

These well-articulated responses show that the candidates possessed a good understanding of the process of artificial insemination. Extract 19.1 presents a sample of the correct responses provided by one of the candidates.



Extract 19.1: A sample of the candidates' correct responses to question 9.

Extract 19.1 shows responses from a candidate who demonstrated good understanding of the subject matter. However, the candidate missed two points in part (a).

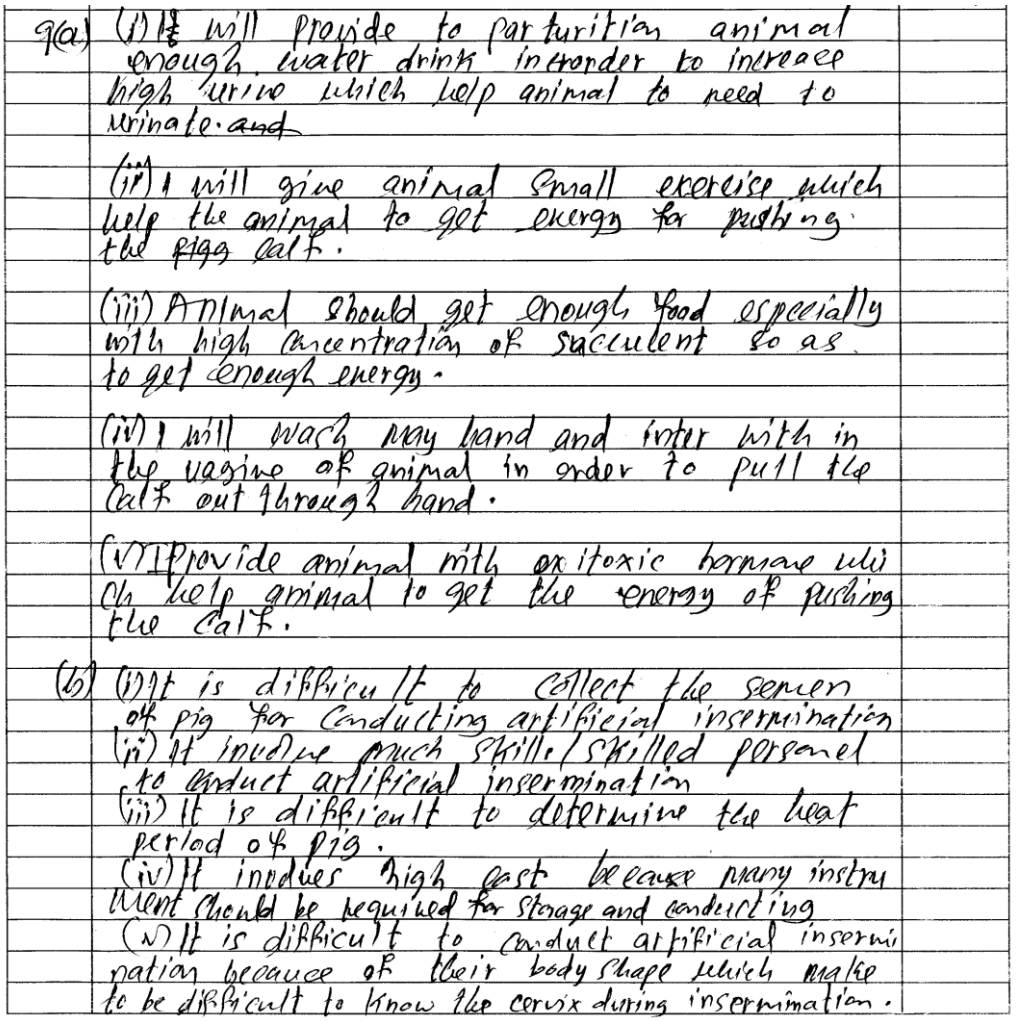
The statistics further indicate that 39.49 per cent of the candidates achieved an average performance. The candidates were characterized by providing insufficient responses to the question. In part (a), the majority of them failed to briefly describe the assistance that should be given to an animal during the calving process. Their responses lacked accuracy and omitted key steps necessary for a successful delivery.

However, in part (b), most of the candidates analysed the disadvantages of not adopting artificial insemination in a piggery farm. While their responses were not exhaustive, they demonstrated a basic understanding of the concept by mentioning a few correct points. A small number of candidates managed to provide relevant responses in both parts (a) and (b), though their responses remained limited and lacked depth. These partially correct but incomplete responses led to moderate scores. Overall, the candidates' responses reflected insufficient knowledge and skills related to animal reproduction.

On the other hand, 53.47 per cent of the candidates had a weak performance. These candidates failed to provide correct responses to almost all parts of the question. In part (a), the majority of the candidates were unable to briefly describe the assistance that should be given to an animal in order to ensure a successful calving process. Many of them provided a variety of incorrect responses such as *surgery*, *pushing the stomach*, *provision of glucose to increase energy*, *arresting the cow into the crush*, and *use of drugs*. These responses reflect a lack of understanding of the procedures involved in assisting the calving process and demonstrate limited knowledge of animal reproduction.

Likewise, in part (b), the candidates failed to analyse the disadvantages of not adopting artificial insemination in a piggery farm. Instead, most of them presented the advantages of using artificial insemination, contrary to the question's requirement. Examples of such incorrect responses include: *it is cheap because there is no need to keep a male animal for breeding*, *it eliminates the use of sterile males*, *it allows use of males from distant places*, *it enables insemination of many females*, and *semen can be used long after the male dies*. These responses indicate that the candidates misunderstood the question and could not distinguish between advantages and disadvantages of artificial insemination. Overall, the candidates' responses revealed a poor grasp of concepts related to animal reproduction and calving assistance.

Extract 19.2 presents a sample of the incorrect responses provided by one of the candidates.


9(a) (i) It will provide to parturition animal enough water drink in order to increase high urine which help animal to need to urinate. and

(ii) I will give animal small exercise which help the animal to get energy for pushing the pigs calf.

(iii) Animal should get enough food especially with high concentration of succulent so as to get enough energy.

(iv) I will wash my hand and inter with in the vagina of animal in order to pull the calf out through hand.

(v) Provide animal with oxitoxic hormone which help animal to get the energy of pushing the calf.

(b) (i) It is difficult to collect the semen of pig for conducting artificial insemination
(ii) It involve much skills / skilled personel to conduct artificial insemination
(iii) It is difficult to determine the heat period of pig.
(iv) It involves high cost because many instrument should be required for storage and conducting
(v) It is difficult to conduct artificial insemination because of their body shape which make to be difficult to know the cervix during insemination.

Extract 19.2: A sample of the candidates' incorrect responses to question 9.

Extract 19.2 presents responses from a candidate who lacked knowledge and skills of animal reproduction. The candidate provided incorrect responses in all parts of the question.

2.2.10 Question 10: Environmental and Technological Challenges in Agricultural Development

Land degradation is an environmental challenge in agricultural development that limits the sustainability of the sector. Prepare five management practices to maintain the quality of the soil as a means of combating the problem.

The question examined the candidates' knowledge and skills of the concept of sustainable agricultural. It was attempted by all 1,094 candidates (100%), of whom 61 (5.58%) scored between 0.0 and 3.0 marks, 227 (20.75%) scored between 3.5 and 5.5 marks, and 806 (73.67%) scored between 6.0 and 10.0 marks. Figure 20 shows the distribution of the candidates' scores for this question.

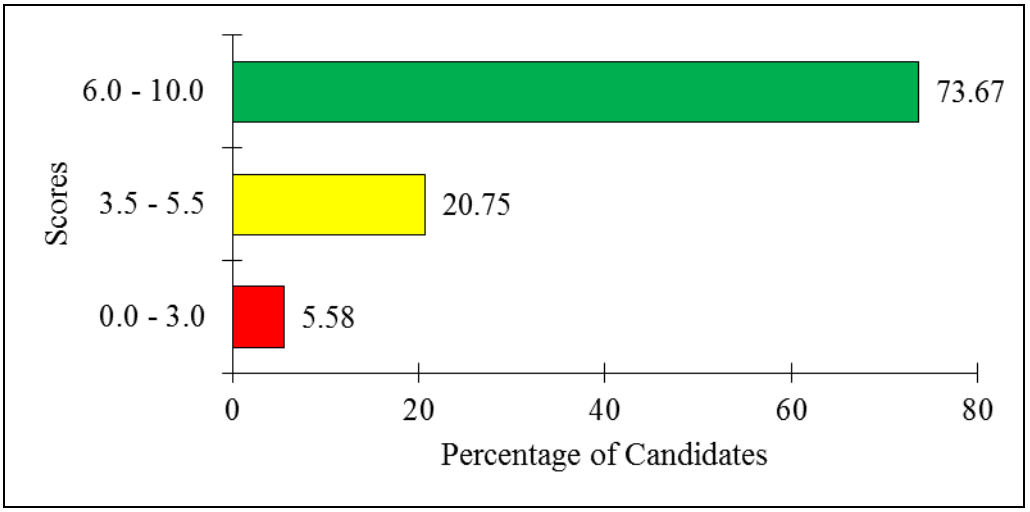


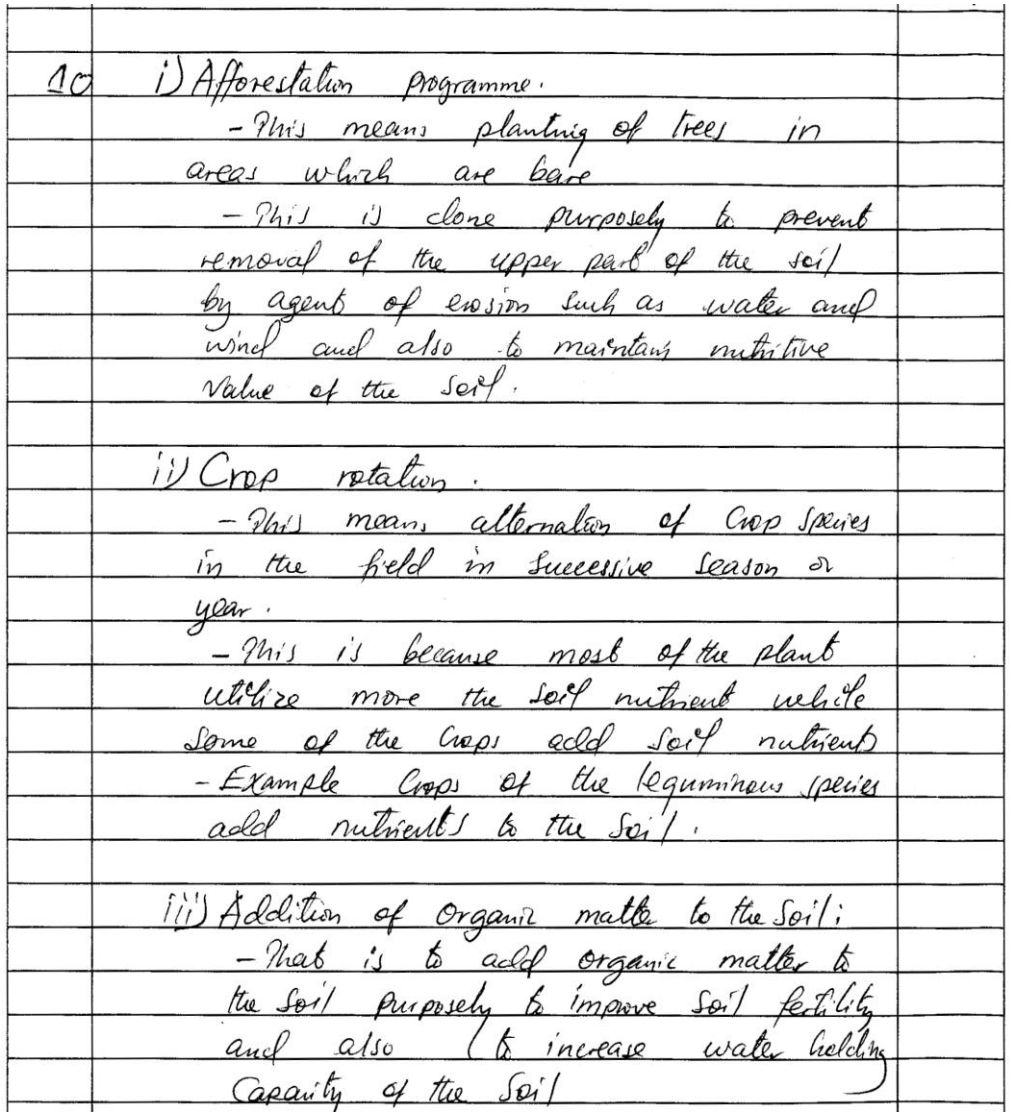
Figure 20: *Candidates' Performance on Question 10*

Figure 20 indicates 94.42 per cent of the candidates scored between 3.5 and 10.0 marks, while 5.58 per cent scored between 0.0 and 3.0 marks. The overall performance on this question was good.

The statistics show that 73.67 per cent of the candidates had good performance on the question. The majority of the candidates provided correct responses to the question, reflecting a solid understanding of soil conservation and land management practices. In their responses, the candidates correctly prepared management practices to maintain soil quality as a means of combating land degradation. The correct responses included:

reduce excessive tillage, *increase organic matter inputs*, use *of cover crops*; *rotate crops*, and *manage nutrients*. Other correct responses included: *apply mulches*, *suppress weeds*, *protect soil organisms*, and *enrich soil upon decomposition*; *reduce excessive use of pesticides and herbicides*, and *prevent erosion*.

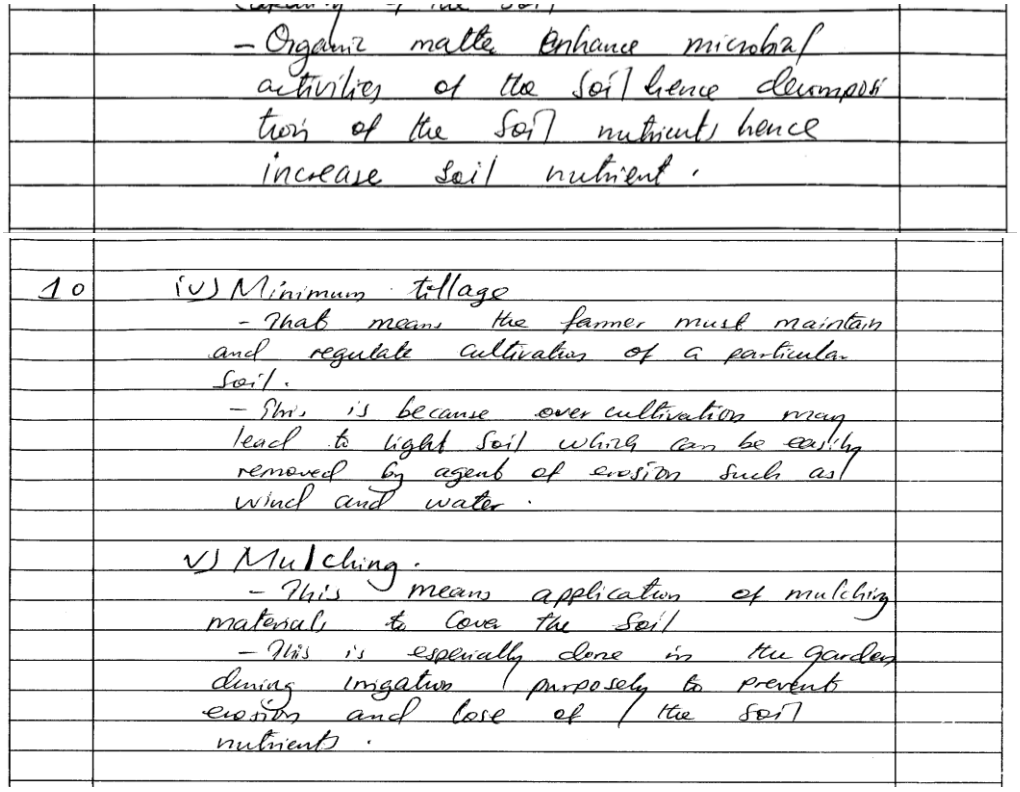
These well-articulated responses demonstrate that the candidates possessed a good understanding of environmental management and sustainable agricultural practices. Extract 20.1 is a sample of the correct responses provided by one of the candidates.



20 i) Afforestation programme.
- This means planting of trees in areas which are bare
- This is done purposely to prevent removal of the upper part of the soil by agent of erosion such as water and wind and also to maintain nutritive value of the soil.

ii) Crop rotation.
- This means alternation of crop species in the field in successive season or year.
- This is because most of the plant utilize more the soil nutrient while some of the crops add soil nutrients
- Example Crops of the leguminous species add nutrients to the soil.

iii) Addition of organic matter to the soil;
- That is to add organic matter to the soil purposely to improve soil fertility and also (to increase water holding capacity of the soil



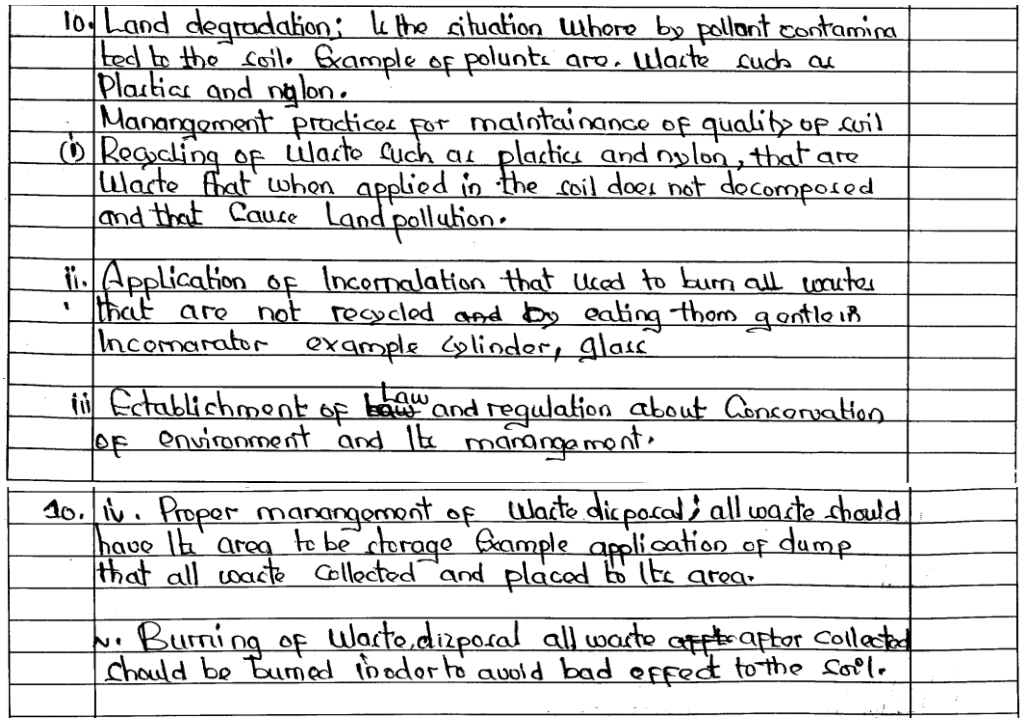
Extract 20.1: A sample of the candidates' correct responses to question 10.

Exract 20.1 indicates responses from a candidate who responded correctly to the question indicating good mastery of the concept of sustainable agriculture.

A total of 20.75 per cent of the candidates had an average performance on the question. Most of them provided inadequate responses to the entire question. They were unable to properly prepare management practices aimed at maintaining soil quality as a means of combating land degradation. Most of them merely listed the practices without offering explanations, while others mentioned a few points but failed to elaborate or cover them comprehensively. Such limited responses resulted in low scores. These responses reflect the candidates' insufficient knowledge and skills in addressing environmental and technological challenges in agricultural development.

On the other hand, 5.58 per cent of the candidates performed poorly on the question. The majority of them failed to provide adequate management practices to maintain soil quality as a means of combating environmental degradation. Many provided a range of incorrect responses such as *burning of*

vegetation, land ownership, soil sterilisation, use of resistant varieties, use of clean seeds, mono-cropping, and *shifting cultivation*. These responses demonstrate a lack of understanding of appropriate soil conservation techniques and reflect the candidates' limited knowledge and skills in addressing environmental and technological challenges in agricultural development. Extract 20.2 is a sample of the incorrect responses provided by one of the candidates.


10. Land degradation; Is the situation where by pollant contamina
ted to the soil. Example of polunts are. Waste such as
Plastics and nylon.
Manangement practices for maintainance of quality of soil
(i) Recycling of waste such as plastics and nylon, that are
Waste that when applied in the soil does not decomposed
and that cause land pollution.

ii. Application of Incornalation that used to burn all wastes
that are not recycled ~~and~~ by eating them gentle in
Incomarator example cylinder, glass

iii Establishment of ~~law~~ law and regulation about Conservation
of environment and its manangement.

10. iv. Proper manangement of waste dicposal; all waste should
have its area to be storage Example application of dump
that all waste collected and placed to its area.

v. Burning of waste, dizposal all waste ~~after~~ after collected
should be burned inodor to avoid bad effect to the soil.

Extract 20.2: Example of the candidates' incorrect responses to question 10.

Extract 20.2 depicts responses from a candidate who showed poor mastery of the subject matter by providing various incorrect responses to the question.

2.3 THE ANALYSIS OF CANDIDATES' PERFORMANCE IN 134/3 AGRICULTURE 3

2.3.1 Question 1: Introduction to Weed Science

You are provided with specimens' ***C*** *(1 wooden box half filled with garden soil and transplanted with bean seedlings and young blackjack weeds at random) and* ***D*** *(10 cm^3 herbicide), source of water, graduated hand sprayer, measuring*

cylinders and a stop watch. Perform the following procedures then answer the questions that follow:

Procedures

(i) Use water to make the plants grown on specimen **C** wet.
(ii) *Pour 1,000 cm^3 of water into a graduated hand sprayer*.
(iii) *By using 10 cm^3 measuring cylinder, measure 10 cm^3 of specimen **D***.
*(iv) Put 10 cm^3 of specimen **D** into a graduated hand sprayer containing 1,000 cm^3 of water*.
(v) *Shake the mixture for about 10 seconds*.
(vi) *Spray the mixture on the plants grown on specimen **C** until all plant parts become covered*.
(vii) *Observe the results of the plants grown on specimen **C** after 20 minutes*.

Questions

(a) *What is the aim of the experiment?*
(b) *What have you observed to plants grown on specimen **C** after 20 minutes*?
(c) *What fault has been noted from your observations in part (b)? Give the cause of the fault.*
(d) *If the quantity of specimen **D** used can spray an area of 1000 m^2, calculate the amount of the specimen **D** a farmer should buy in order to spray his 10-hectare of maize field.*
(e) *Advise the farmer on the proper ways of handling and using specimen **D**. Give seven points.*
(f) *Account for the three modes of action of specimen **D**.*

The question assessed candidates' competence in chemical weed control. It was attempted by all 1,094 candidates (100%), of whom 36 (3.29%) scored between 0.0 and 6.5 marks, 418 (38.21%) scored between 7.0 and 11.5 marks, and 640 (58.50%) scored between 12.0 and 20.0 marks. Figure 21 shows the distribution of the candidates' scores for this question.

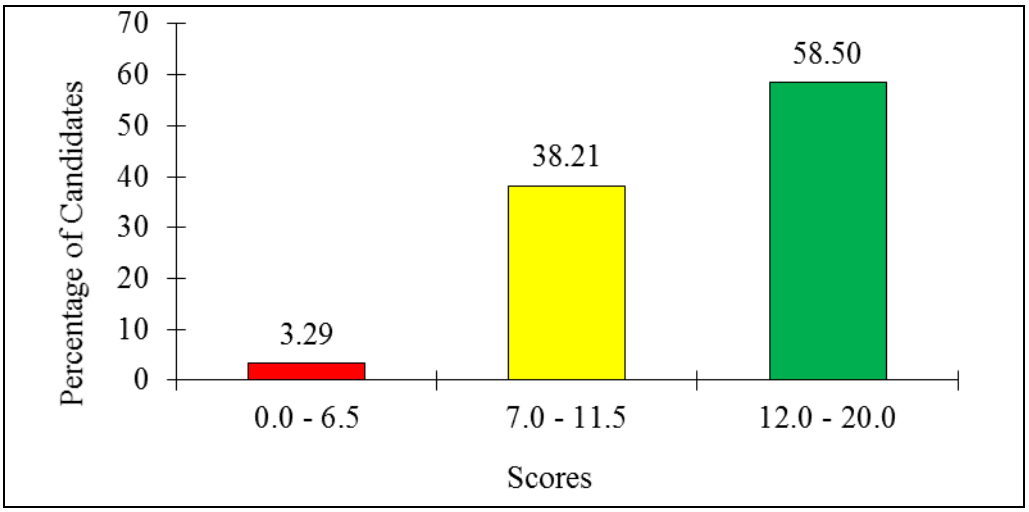


Figure 21: *Candidates' Performance on Question 1*

In view of Figure 21, 96.71 per cent of the candidates scored between 7.0 and 20.0 marks, while 3.29 per cent scored between 0.0 and 6.5 marks. The overall performance on this question was good.

Data indicate that 54.89 per cent of the candidates performed well on the question. The majority provided correct responses to all parts. In part (a), the candidates managed to state the aim of the experiment correctly. The correct response was: *The experiment aims to show the effects of herbicide or chemical on weeds/plants.* Similarly, in part (b), the candidates correctly stated the observation made 20 minutes after applying the herbicide on the weeds. An example of an appropriate response was *leaves of both weed and bean plants appeared to wilt.* Furthermore, in part (c), the candidates successfully stated the fault observed from the observation in part (b) and gave the correct cause of the fault. A good example of the response was: *wilting of the bean plants, which was not expected since they are not weeds. This fault was caused by the application of a non-selective herbicide, which indiscriminately killed both the crop plant and the weeds.* Likewise, in part (d), the candidates were able to correctly calculate the amount of herbicide required to cover a 10-hectare maize field as follows.

Data
Quantity of specimen D (herbicide) used=10 cm^3
Area which can be sprayed=1,000 m^2

Area to be sprayed =10 ha
Quantity of specimen D required to spray 10 ha =?

If 10 cm^3 of specimen D was sprayed on 1,000 m^2
X will be required to spray 10 ha

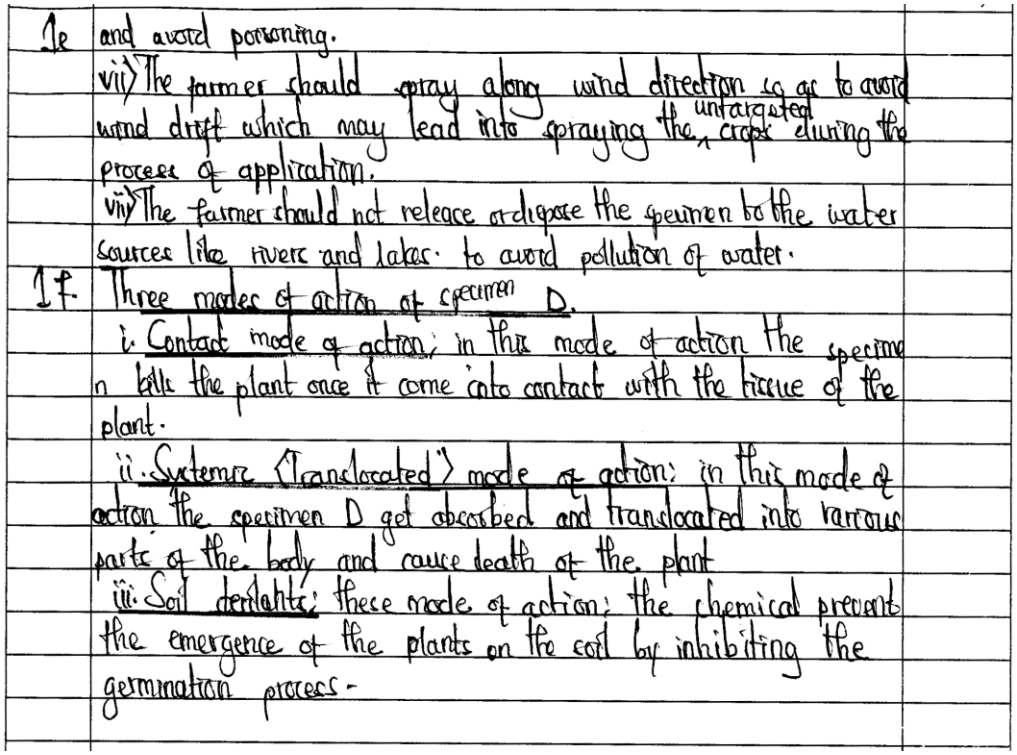
1ha=10,000 m^2
10 ha=?
$\frac{10ha \times 10000m2}{1ha}$ *=100,000m^2*
10 cm^3 of specimen D sprayed 1,000 m^2
If X will be required to spray 100,000 m^2

$\frac{10\ cm3 \times 100,000m2}{1000m2}$ *=1,000 cm^3*

The farmer will need to buy 1,000 cm^3 or 1 litre of specimen D (herbicide).

In part (e), the candidates managed to give appropriate advice to the farmer on proper handling and usage of herbicides. Examples of the correct advice included: *carefully read and follow the manufacturer's instructions; wear protective clothing such as overalls, breathing masks, gloves, boots, and goggles during spraying; avoid smoking or eating while spraying; do not blow or suck blocked nozzles; spray along the direction of the wind to avoid drift of the chemical to non-target species and to prevent inhalation; wash the body thoroughly and change clothes after spraying; dispose of leftovers and empty containers properly, for example by burying them deeply, and avoid throwing them in gardens, bushes, or pasture land; wash spraying equipment far from water sources; store chemicals in a safe place, away from children and food items; clean spraying equipment thoroughly before using it for other chemicals such as acaricides; allow sufficient time before harvesting treated crops to ensure that the chemical has broken down to safe levels; and keep accurate records of chemical application to avoid unnecessary repeat spraying.* Finally, in part (f), the candidates correctly explained the mode of action of herbicides. Examples of correct responses included: *contact herbicides, which kill only the part of the weed they directly touch, such as Paraquat, hence thorough wetting is necessary; systemic (or translocated) herbicides, which are absorbed into the plant's vascular system and transported throughout the plant to kill it entirely, such as 2,4-D and Dalapon, and are most effective when applied to actively growing weeds; and soil sterilant (or soil-acting herbicides), which are applied to the soil at high*

concentrations to inhibit all plant growth, such as Duron, methyl bromide, and metham-sodium. Such correct responses reflect the candidates' good understanding of herbicide use and weed control techniques. Extract 21.1 presents a sample of such correct responses to the question.



1e and avoid poisoning.
vii) The farmer should spray along wind direction so as to avoid wind drift which may lead into spraying the untargeted crops during the process of application.
viii) The farmer should not release or dispose the specimen to the water sources like rivers and lakes to avoid pollution of water.

1f. Three modes of action of specimen D.
i. Contact mode of action; in this mode of action the specimen kills the plant once it come into contact with the tissue of the plant.
ii. Systemic (Translocated) mode of action; in this mode of action the specimen D get absorbed and translocated into various parts of the body and cause death of the plant
iii. Soil residuals; these mode of action; the chemical prevent the emergence of the plants on the soil by inhibiting the germination process.

1d. Data given.
Quantity of specimen D used = 10cm³
Area to be sprayed by 10 cm³ of specimen D = 1000m².
Required: Amount of specimen D a farmer should buy in order to spray 10 hectare of maize field.

From: 1 hectare = 10000 m²
10 hectare = ?

$= \frac{10\ ha \times 10000\ m^2}{1\ ha}$

Area of field = 100 000 m²

Then: 10 cm³ of specimen D sprays = 1000m²
? 100 000m².

$= \frac{10cm^3 \times 100\,000\ m^2}{1000m^2}$

= 1000cm³

But 1L = 1000 cm³.

∴ A farmer should buy One litre of specimen D in order to spray his 10 hectare of maize field.

e Proper ways of handling and using specimen D.

i) Apply the specimen D on the recommended rate as instructed

ii) Avoid smoking, eating or drinking while applying the specimen D. on the farm.

iii) Wear the safety and protective gears like mask, gloves, gumboots and overalls to avoid direct contact with the chemicals.

iv) Apply the specimen D when the weather is calm and when the rain is not nearly to rain soon after spraying.

v) The farmer should apply the specimen D only to the targeted plants and not otherwise to avoid contaminating beneficial plants.

vi) Storing the specimen D in a cool and dry place away from the direct sunlight and reach of the childrens to maintain its efficiency

1 a. The aim of the experiment was to demonstrate the action of specimen D (herbicide) on the plants grown in specimen C.

b) Plants grown on specimen C curl their leaves after 20 minutes and they become dry showing a wilting appearance.

c) Fault noted was the curling of the leaves of the ~~specimen~~ plants grown on specimen C.

The cause of the fault is as the action of specimen D to the plants as it disturb the proper functioning of the plants when it come into contact with them.

Extract 21.1: A sample of the candidates' correct responses to question 1.

Extract 21.1 presents responses from a candidate who correctly attempted all parts of the question. This indicates possession of adequate practical skills and knowledge of the subject matter.

Moreover, data indicate that 38.21 per cent of the candidates had average performance. Most of them provided inadequate responses to the question. They managed to provide correct responses in parts (d) and (e), although they failed to exhaust the points and missed the other parts entirely. Such inadequate responses led the candidates to score average marks. These

responses indicate possession of inadequate knowledge and skills about chemical weed control.

However, 3.29 per cent of the candidates had a weak performance. Most of them provided incorrect responses to almost all parts of the question. In part (a), the majority of the candidates failed to state the correct aim of the experiment. Examples of such incorrect responses included: *to control the mixture of plants by herbicides, to improve the growth of the plant, to encourage flowering to the plant, to know the quantity of herbicides to use,* and *to speed up plant maturity.*

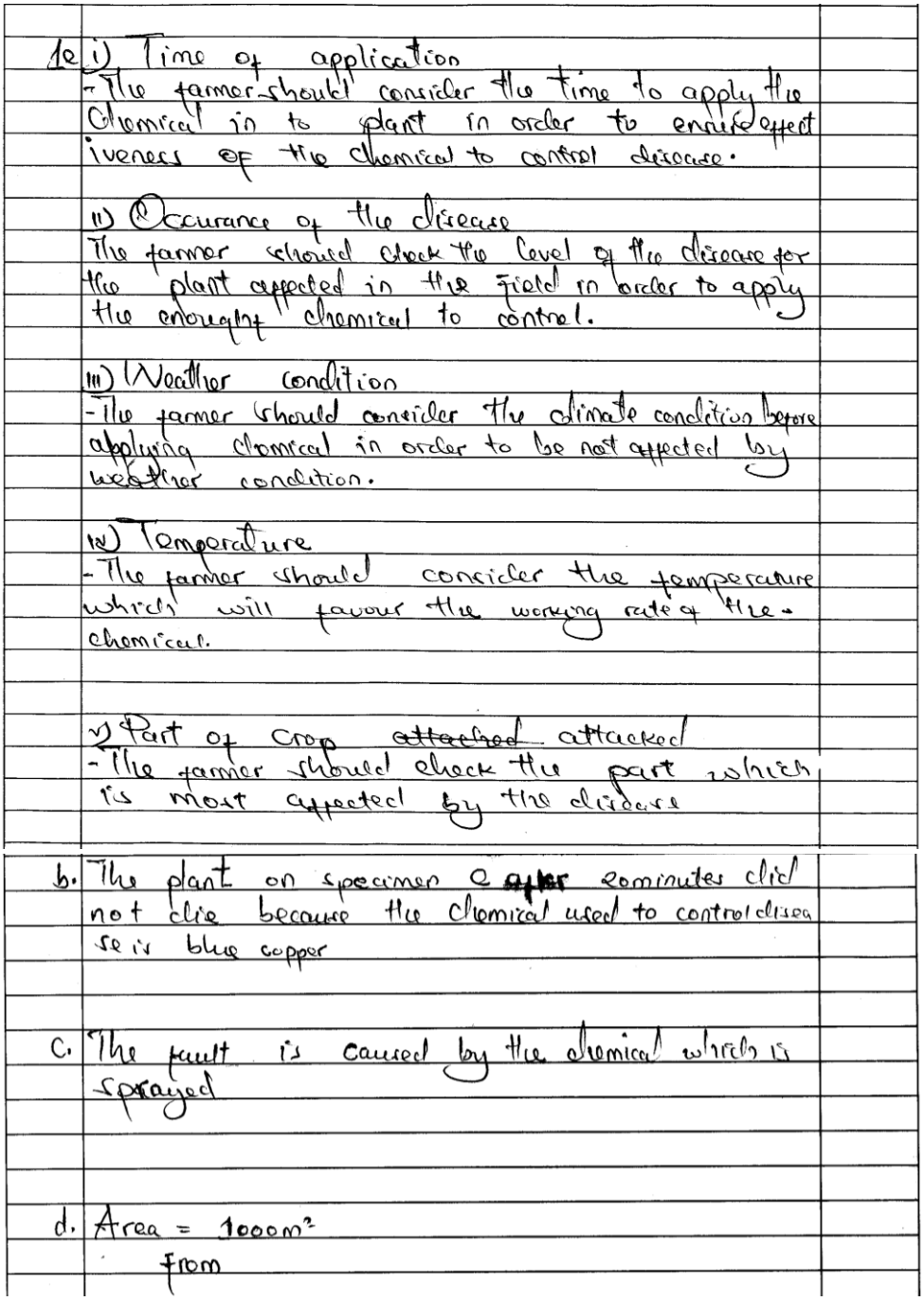
In part (b), the candidates failed to provide correct observations of specimen C (wooden box with plants) and instead gave a variety of incorrect responses such as: *after 20 minutes the plant lost its mobility of growing in the field, the plant species does not show any changes, the plant was looking strong, the plant was more green in colour,* and *the plant appeared yellow in colour.*

In part (c), the candidates failed to explain the fault that occurred in the plants inside the box, instead providing incorrect responses such as: *ineffectiveness of the herbicide, the fault is applying herbicides during wet conditions, the source of the fault is water, poor spraying techniques,* and *the absence of sunlight in the room.* Likewise, in part (d*),* they failed to calculate the amount of herbicide to be used. The candidates used incorrect formulae.

In part (e), the candidates failed to advise the farmer on the proper ways of handling and using specimen D (herbicide). The majority instead suggested general agronomic practices such as: *crop rotation, mulching, use of cover crops, proper spacing,* and *timely land preparation*. Others gave various incorrect responses such as: *consider the age of the plant, consider the type of weed, think of the weather condition, choose the life cycle of the weed,* and *consider the climate of the area.*

In part (f), the candidates failed to explain the mode of action of specimen D (herbicide). The majority gave various incorrect responses such as *through the morphology of the plant, it can take action depending on the time of application, it acts through inhibition of growth and reproduction, through*

energy inhibition action, and *through inhibiting photosynthesis.* Such responses reflect a general lack of knowledge and skills of the use of herbicides in weed control. Extract 21.2 presents a sample of the incorrect responses to the question.


1e i) Time of application
- The farmer should consider the time to apply the chemical in to plant in order to ensure effectiveness of the chemical to control disease.

ii) Occurance of the disease
The farmer should check the level of the disease for the plant affected in the field in order to apply the enbought chemical to control.

iii) Weather condition
- The farmer should consider the climate condition before applying chemical in order to be not affected by weather condition.

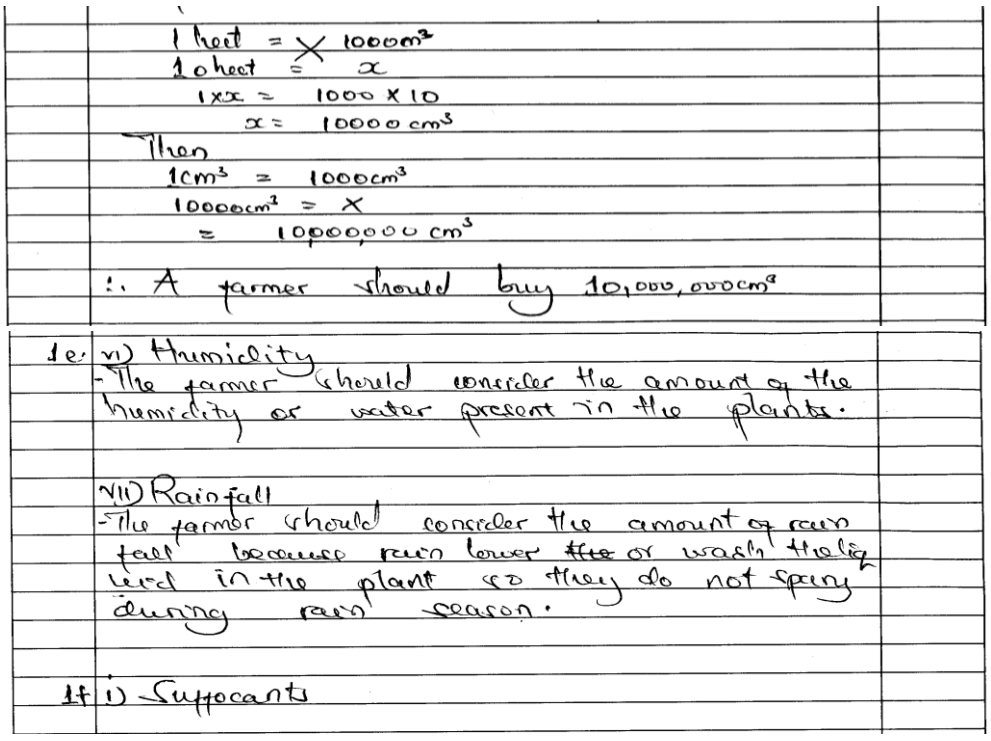
iv) Temperature
- The farmer should consider the temperature which will favour the working rate of the chemical.

v) Part of crop ~~attached~~ attacked
- The farmer should check the part which is most affected by the disease

b. The plant on specimen e ~~after~~ 20minutes did not die because the chemical used to control disease is blue copper

c. The fault is caused by the chemical which is sprayed

d. Area = 1000m²
From



Extract 21.2: A sample of the candidates' incorrect responses to question 1.

Extract 21.2 illustrates responses from a candidate who provided incorrect responses to all parts of the question, signifying a lack of subject matter knowledge and skills.

2.3.2 Question 2: Introduction to Animal Health

*You are provided with specimens' **T** (live tick) and **U** (live tick), **X** (concentrated acaricides) and **Y** (diluted acaricides), two syringes, two test tubes and two groves. Perform the following procedures then answer the questions that follow*:

Procedures

(i) *Wear the gloves.*

(ii) *By using forceps, hold and place specimen **T** (live tick) into the test tube labeled **1**.*

(iii) *Measure 5 cm^3 of specimen **X** (concentrated acaricides) by using syringe.*

(iv) *Release specimen **X** (concentrated acaricides) into the test tube labeled **1** drop wise until you observe changes to the specimen **T** (live tick).*

(v) *Repeat the same procedures to specimen **U** (live tick) in a test tube labeled **2** by using **Y** (diluted acaricides).*

Questions

(a) *What is the aim of the experiment*?
(b) *What have you noticed from the experiment?*
(c) *From the results of experiment, which specimen would you recommend for use between **X** and **Y***?
(d) *Briefly explain the stages of development from the egg to adult that specimens **T** and **U** can pass if the farmer is keeping only one cattle.*
(e) *The farmer was keeping a large number of cattle which were severely infected with various species of specimens **T** and **U**. Suggest the possible disease that may occur to the farmer's heard if the recommended specimen in part (c) is not used.*
(f) *Briefly explain three methods of applying specimen **X** on animals.*

The question assessed the candidates' competence in controlling animal parasites. It was attempted by all 1,094 candidates (100%), of whom 43 (3.93%) scored between 2.0 and 5.0 marks, 219 (20.02%) scored between 5.5 and 8.5 marks, and 832 (76.05%) scored between 9.0 and 15.0 marks. Figure 22 illustrates the distribution of the candidates' scores for this question.

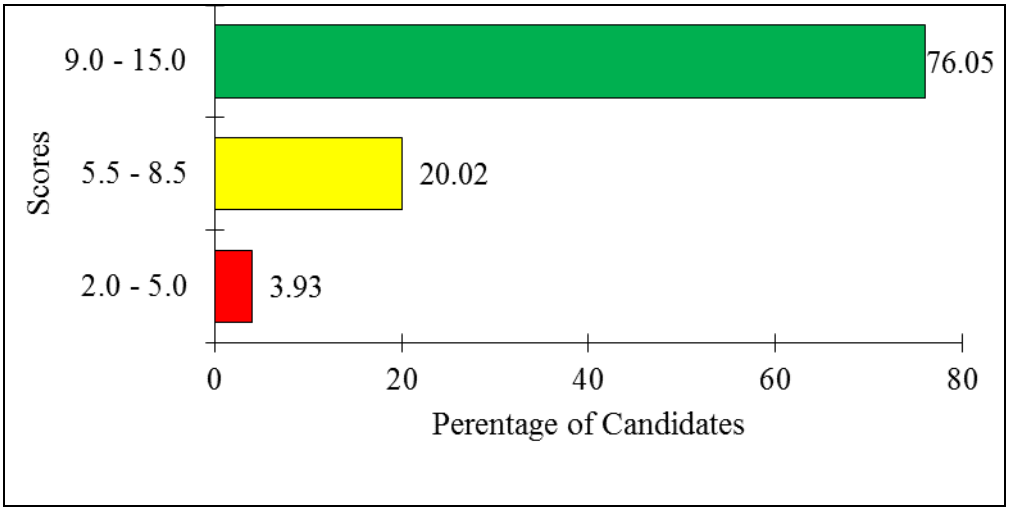


Figure 22: *Candidates' Performance on Question 2*

Figure 22 indicates 96.07 per cent of the candidates scored between 5.5 and 15.0 marks, while 3.93 per cent of the candidates scored between 2.0 and 5.0 marks. The general performance on the question was good.

Data analysis reveals that, 76.05 per cent of the candidates performed well on the question, with the majority providing correct responses to almost all parts**.** In part (a), the candidates successfully stated the aim of the experiment. A correct response was: *The aim of the experiment was to investigate the effects of acaricide on ticks at different concentrations of poison.*

In part (b), the candidates correctly described the observations made during the experiment. A typical accurate response was: *Specimen **T** attempted to escape from specimen **X** but eventually died due to the high toxicity of specimen **X**. In contrast, specimen **U** remained alive when specimen **Y** was applied, as the diluted poison in specimen **Y** was not strong enough to kill the tick.*

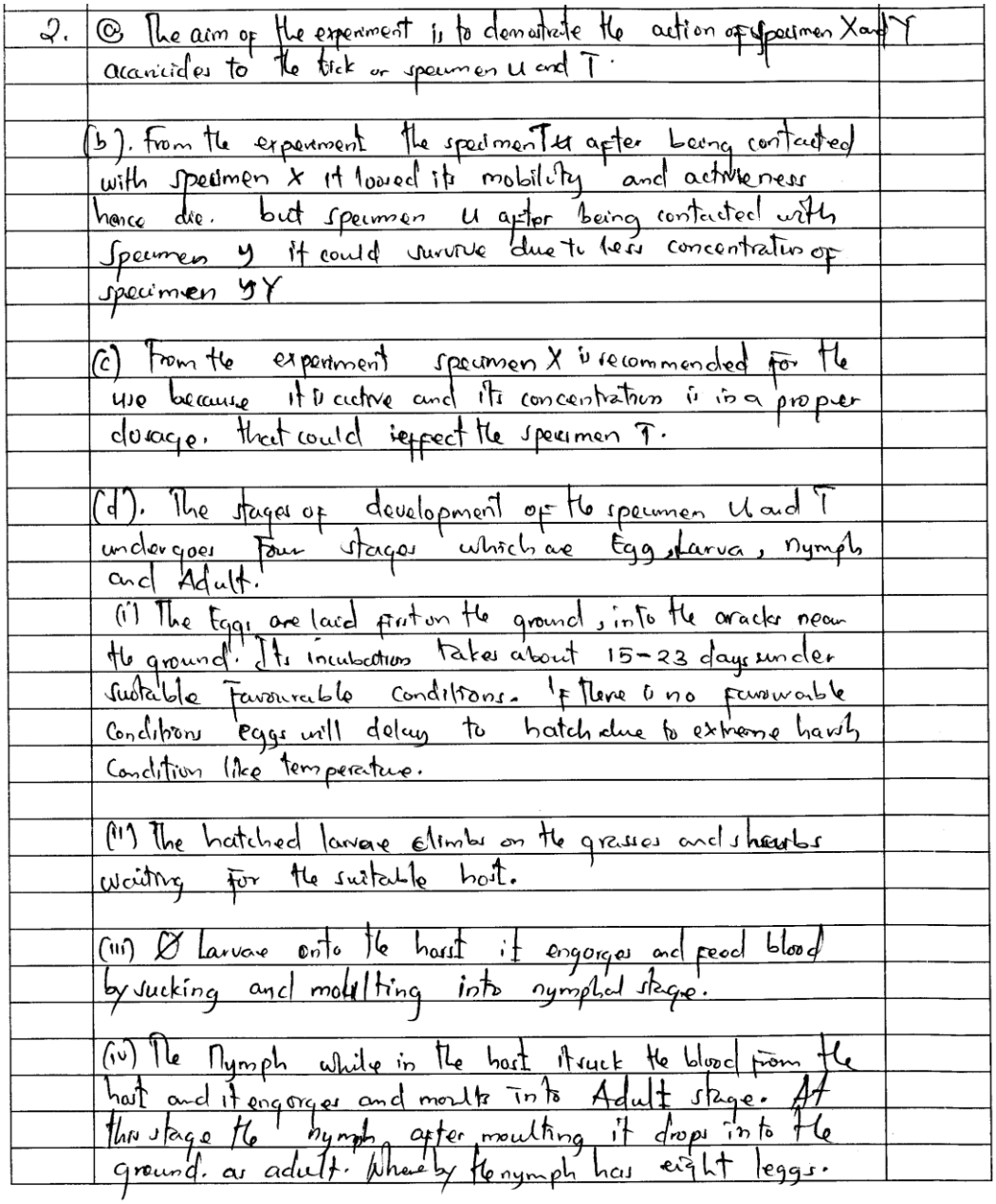
In part (c), the candidates correctly recommended the most effective specimen for use. An appropriate response was: *Specimen **X** is recommended due to its high level of toxicity, which effectively kills ticks.*

In part (d), the candidates successfully explained the stages of development from egg to adult that specimens **T** and **U** (ticks) undergo, assuming the farmer is keeping one cow. A correct sequence of development was: *The female tick lays eggs on the ground; the eggs hatch into larvae within four to six weeks; the larvae climb plant stems and leaves and are brushed onto a passing host; the larvae feed on the host's blood, become engorged, and moult into nymphs; the nymphs also engorge on blood and moult into adults; the adults mate on the host while feeding; and the engorged female drops to the ground to lay eggs, thus continuing the life cycle.*

Likewise, in part (e), the candidates were able to mention the possible diseases that could affect the farmer's cattle if the recommended specimen in part (c) is not used. Correct responses included: *red water, gall sickness, anaplasmosis, heartwater, and East Coast fever.*

In part (f), the candidates accurately described three methods of applying specimen **X** (acaricide) to animals. Examples of correct responses included: *dipping: the process of immersing an animal into a dip tank, where it swims through the medicated solution along the full length of the bath, spraying:*

applying acaricide directly onto the animal's body using spray equipment to control ticks, hand dressing: manually applying acaricide to specific areas of the animal, especially where spraying may not reach, such as inside the ears or under the tail. Such correct responses across all parts of the question reflect the candidates' good understanding and practical skills in tick control and acaricide use**.** Extract 22.1 presents a sample of such correct responses from one of the candidates.


2. @ The aim of the experiment is to demonstrate the action of specimen X and Y acaricides to the tick or specimen U and T.

(b). From the experiment the specimen T at after being contacted with specimen X it loosed its mobility and activeness hence die. but specimen U after being contacted with specimen Y it could survive due to less concentration of specimen Y Y

(c) From the experiment specimen X is recommended for the use because it is active and its concentration is in a proper dosage. that could ieffect the specimen T.

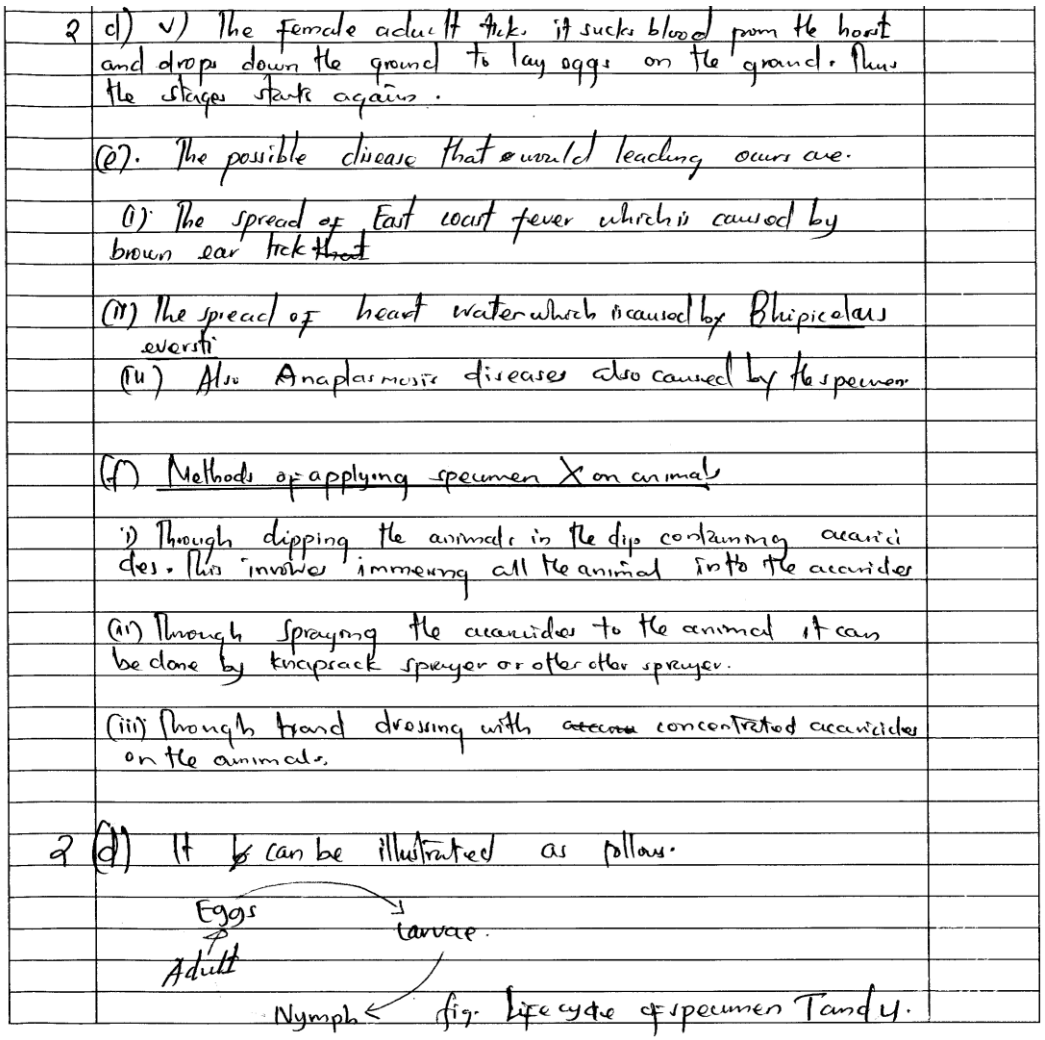
(d). The stages of development of the specimen U and T undergoes four stages which are Egg, larva, nymph and Adult.

(i) The Eggs are laid first on the ground, into the cracks near the ground. Its incubations takes about 15-23 days under suitable favourable conditions. If there is no favourable conditions eggs will delay to hatch due to extreme harsh condition like temperature.

(ii) The hatched larvae climbs on the grasses and shrubs waiting for the suitable host.

(iii) Ø Larvae onto the hosst it engorges and feed blood by sucking and moulting into nymphal stage.

(iv) The Nymph while in the host it suck the blood from the host and it engorges and moults into Adult stage. At this stage the nymph after moulting it drops into the ground. as adult. Where by the nymph has eight leggs.



Extract 22.1: A sample of the candidates' correct responses to question 2.

Extract 22.1 presents responses from a candidate who responded to all parts of the question correctly, demonstrating sufficient practical skills and a strong understanding of the subject matter.

Moreover, data indicate that 20.02 per cent of the candidates had an average performance. Most of them managed to provide correct responses to some parts of the question, particularly parts (c), (d), and (e). In part (c), the candidates correctly recommended the appropriate acaricides to use. In part (d), they briefly explained the stages of development from egg to adult, although they failed to exhaust all the stages. In part (e), the candidates successfully suggested the diseases that may occur if the recommended specimen is not used. However, the remaining parts of the question were poorly addressed. Such partial and

inadequate responses led the candidates to score average marks. These responses reflect limited knowledge and practical skills among the candidates.

However, 3.93 per cent of the candidates had a weak performance. Most of them provided incorrect responses to all parts of the question. In part (a), the candidates failed to state the correct aim of the experiment. Instead, they gave a variety of incorrect responses such as: *to determine the effects of herbicides, to determine the size of the syringe, to investigate the effects of acaricides on dead and alive ticks, to determine the effects of herbicides on ticks*, and *to remove weeds*.

In part (b), the candidates failed to state the correct observations from the experiment. Examples of incorrect responses included: *the tick remained at the bottom of test tube number one while in test tube number two the tick was seen at the top, the formation of a dip with white colour, the colour of the dip changed from colourless to white*, and *the colour changed from yellow to white*.

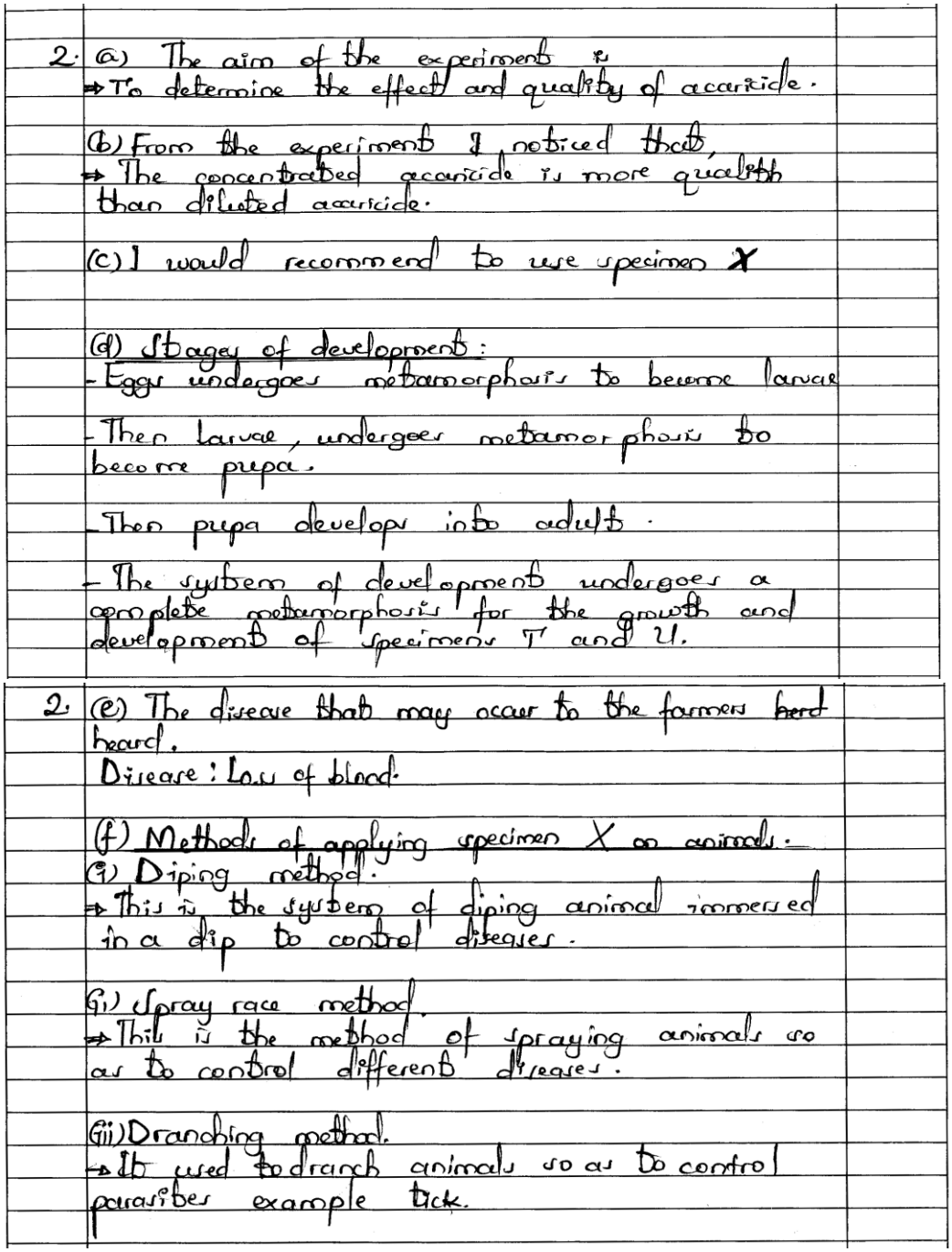
In part (c), the candidates failed to recommend the appropriate specimen to use between specimen **X** (concentrated acaricides) and specimen **Y** (diluted acaricides). A majority of them gave incorrect responses, such as: *the recommended specimen to use is **X** and **Y***, and *the recommended specimen to use between **X** and **Y** is tick*.

In part (d), the candidates failed to explain the stages of development from egg to adult that specimens T and U would undergo if the farmer was keeping only one animal. Instead, most of them described the development of ticks by mixing up the concepts of one-host, two-host, and three-host ticks.

In part (e), the majority of candidates failed to suggest the correct diseases that may occur in the farmer's herd if the recommended acaricide is not used. Instead, they listed unrelated or incorrect diseases, such as C*occidiosis*, *Plasmodium*, *Trypanosomiasis*, *Yellow Fever*, and *Rift Valley Fever*.

Similarly, in part (f), the candidates failed to briefly explain three methods of applying specimen **X** (concentrated acaricides). Most of them provided a range of incorrect responses including: *by using syringe*, *by chemical method*, *by drenching*, *by biological method*, *by mechanical method*, *by vaccination method*, and *by systematic method*. These responses highlight a general lack of

practical skills in tick control using acaricides. Extract 22.2 presents a sample of the incorrect responses provided by one of the candidates.



Extract 22.2: A sample of the candidates' incorrect responses to question 2.

Extract 22.2 exemplifies responses from a candidate who responded incorrectly to almost all parts of the question except in part (a) and some points in part (c), (e) and (f).

2.3.3 Question 3: Farm Mechanisation and Machinery

*You are provided with specimen **M** (10 litres capacity bucket filled with water), knapsack sprayer and a wall clock. Perform the following procedures then answer the questions that follow*:

Procedures

(i) *Fill a knapsack sprayer with specimen **M** (10 litres capacity bucket filled with water).*

(ii) *Take a knapsack sprayer containing specimen **M** from its position and put it on your back and adjust the shoulder straps until you fill comfortable*.

(iii) *Pump the operating handle until you notice a difference and direct the delivery tube into the water sink.*

(iv) *Stop pumping after noticing the difference*.

(v) *Grip and press on-off lever for 30 seconds (a half a minute).*

(vi) *Observe the pattern of mist of liquid coming out for 30 seconds (a half a minute).*

(vii) *Remove a sprayer from your back and place it in its original position*.

Questions

(a) *What difference was noticed when pumping the operating handle*?

(b) *Briefly explain the implication of the difference noticed in part (a).*

(c) *Why is the on-off lever not pressed before and during pumping the operating handle*?

(d) *Briefly describe the pattern of liquid observed coming out.*

(e) *Which part of the sprayer is responsible for making liquid pattern in part (d)*?

(f) *Proper working of the part named in (e) is essential for efficient functioning of sprayer. How would you maintain the part*?

(g) *What are the factors to consider when carrying out procedure (i) – (iii) in the field of crops for controlling pests*? *Give five points.*

The question tested candidates' competence in operating the knapsack sprayer.

The question was attempted by all 1,094 candidates (100%), of whom 119 (10.88%) scored between 0.0 and 5.0 marks, 309 (28.24%) scored between 5.5 and 8.5 marks, and 666 (60.88%) scored between 9.0 and 15.0 marks. Figure 23 shows the distribution of the candidates' scores for this question.

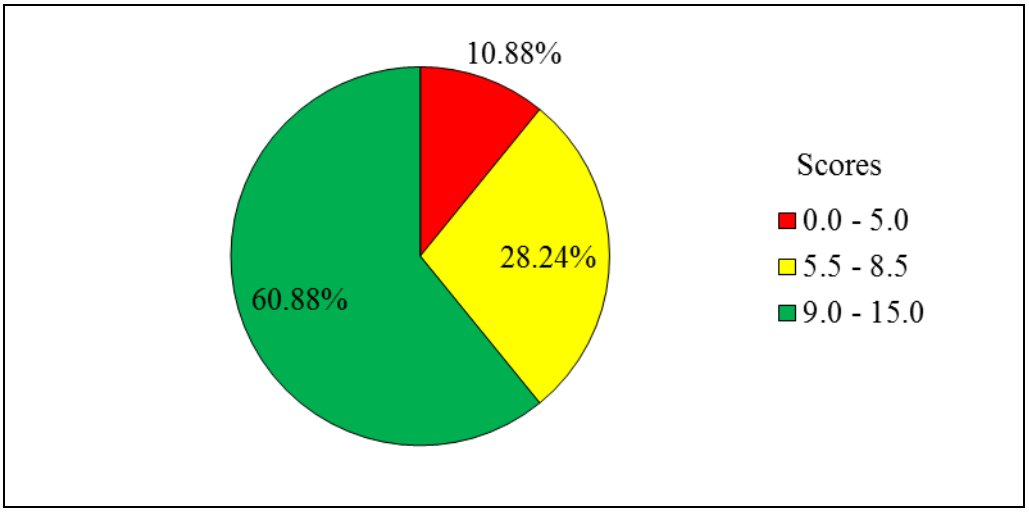


Figure 23: *Candidates' Performance on Question 3*

Figure 23 depicts 89.12 per cent of the candidates scored between 5.5 and 15.0 marks, while 10.88 per cent scored between 0.0 and 5.0 marks. The overall performance on the question was good.

Data analysis indicates that 60.88 per cent of the candidates performed well on the question, with the majority providing correct responses to almost all parts. In part (a), the candidates successfully stated the difference noticed when pumping the operating handle. A correct response was: *initially, pumping was easy, but as pumping continued, it became more difficult.* Likewise, in part (b), the candidates were able to briefly explain the implication of the difference observed in part (a). A correct response was: *pressure was being built up inside the sprayer, which created the force necessary to push the liquid out through the nozzle.*

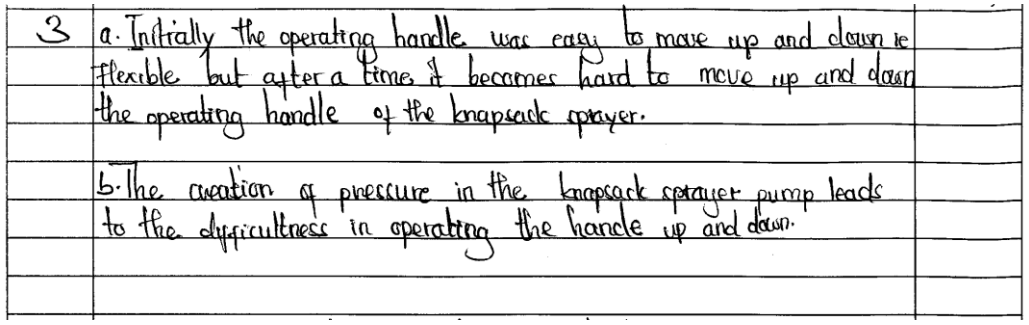
In part (c), the candidates correctly stated the reason for not pressing the on-off lever before and during the pumping process. A typical correct response was: *the on-off lever was not pressed before and during pumping to allow pressure to build up in the sprayer so that, when released, the spray would be properly*

dispersed over the target surface. In part (d), the candidates accurately described the pattern of the liquid observed during spraying. A correct description was: *the liquid came out in the form of fine droplets that were evenly dispersed over the surface being sprayed.*

In part (e), the candidates correctly identified the part of the sprayer responsible for producing the spray pattern described in part (d). The correct response was: *the nozzle.* In part (f), the candidates correctly explained how to maintain the part identified in part (e). A correct response was: *the nozzle should be unblocked in case of any blockage to ensure a consistent spray pattern.*

Moreover, in part (g), the candidates successfully outlined the factors to consider when performing procedures (i) to (iii) in the field during pests control using a knapsack sprayer. Correct responses included: *during filling the knapsack sprayer with specimen **M**: Ensure the inside of the tank is clean to prevent contamination; use clean water or chemical solution free from dirt; check for leaks; wear gloves to avoid contact with chemicals; and avoid overfilling the tank. During carrying the knapsack sprayer on the back, adjust the shoulder straps so the sprayer fits comfortably and securely; balance the load to prevent strain on the back and shoulders; and maintain an upright posture. During pumping and spraying: Maintain consistent pressure while spraying; monitor the spray pattern; avoid over-pressurizing the sprayer; do not pump while moving; aim the spray at the target area; avoid spraying during windy or rainy conditions; do not spray in the early morning or late evening; wear protective gear; and do not eat, drink, or smoke while spraying chemicals.*

Such correct responses across all parts of the question demonstrate the candidates' understanding and practical skills in operating the knapsack sprayer. Extract 23.1 presents a sample of the correct responses from one of the candidates.


3 a. Initially the operating handle was easy to move up and down ie flexible but after a time it becomes hard to move up and down the operating handle of the knapsack sprayer.

b. The creation of pressure in the knapsack sprayer pump leads to the difficultness in operating the handle up and down.

c. On-off lever not pressed before and during pumping the operating handle in order to allow the creation of sufficient pressure in the pump so as to produce a fine and uniform mist as a sufficient pressure is created.

d. Pattern of liquid observed coming out was fine mist
- The fine mists of droplets uniformly was observed coming out of the nozzle with a good speed from the nozzle to the sink.

e. The part of sprayer responsible is nozzle.

f. Maintainance of the nozzle
- Unblocking the blocked nozzle by opening its cap and flushing with large amount of water and replace the damaged nozzle with the news ones so as to increase effective funtioning of sprayer.

g. Factors to consider when carrying out procedure (i) - (iii). in the field of crops for controlling pest.
i. Mixing the pesticides (chemicals) with water at the correct amount i.e concentration according to the manufacturers instructions
ii. Wear the safety and protective gears like gloves, masks, gumboots

3g ii) and overalls to prevent direct contact with the chemicals.
iii) Ensure all parts of the knapsack sprayer are in good and proper working condition and replace the damaged or worn out parts of the sprayer.
iv) Check the weather condition and if it is seen to rain soon or there is high sunlight do not spray and wait for the next day with good weather condition as to avoid dilution of the pesticide and its breakdown by the sunlight.
v) Ensure that the tank of the sprayer is clean and by washing it with plenty of clean water and using a specific type of pesticide to control a specific pest eg. rodenticide for controlling rodents, fungicides for fungi and avicides for controlling birds.

Extract 23.1: A sample of the candidates' correct responses to question 3.

Extract 23.1 shows responses from a candidate who provided correct responses to all parts of the question. This demonstrates possession of adequate knowledge and skills in operating the sprayer.

Moreover, data indicate that 28.24 per cent of the candidates had an average performance in this question. Most of them provided correct responses to some parts, particularly parts (a), (b), (e), and (f). In part (a), the candidates correctly identified the difference observed when pumping the operating handle. In part (b), they were able to explain the implication of that difference. Similarly, in part (e), the candidates accurately named the part of the sprayer responsible for producing the observed spray pattern, while in part (f), they correctly described the maintenance of that part.

However, in parts (c), (d), and (g), the candidates provided inadequate responses. In part (c), the majority failed to clearly explain the reason for not pressing the on-off lever before and during pumping, leading to low scores. Likewise, in part (d), the candidates gave vague or incomplete descriptions of the liquid spray pattern. Moreover, in part (g), most of the candidates who attempted this part mentioned only a few relevant points and failed to provide a comprehensive explanation of the procedures for using the knapsack sprayer in the field.

Such partial and insufficient responses led the candidates to score average marks. These responses reflect limited understanding and practical skills in the use and handling of knapsack sprayers.

On the other hand, 10.88 per cent of the candidates had a weak performance. Most of them provided incorrect responses to almost all parts of the question. In part (a), the majority of the candidates failed to explain the difference noticed when pumping the operating handle. They provided a range of incorrect responses, such as: *there was an up and down movement of the piston in the sprayer; at the beginning, no difference was noticed; there was direct delivery of water through the tube; the force entered directly into specimen **M** and increased its volume in the knapsack sprayer; and the pump was heavy in weight*.

In part (b), the candidates failed to explain the implication of the differences noticed in part (a). Most of them gave incorrect responses such as: *the upward and downward movement of the piston makes the liquid come out; the mist*

liquid comes out for 30 seconds through the nozzle; the pumping action becomes difficult meaning the liquid is ready to come out; and the implication of the difference noticed is that the pump is about to burst.

Furthermore, in part (c), the candidates failed to give the correct reason for not pressing the on-off lever while pumping the operating handle. Examples of incorrect responses provided included: *it ensures equal distribution of water in the field; the spray will be slow; it ensures efficiency of the machine by measuring the work; and the on-off lever may lead to low pressure because no more specimen is collected for being forced out*. In part (d), the candidates failed to correctly describe the pattern of the liquid observed coming out. Most of them gave responses such as: *water came out with high pressure; piston forced valve **A** and **B** to open and release the liquid; water-soluble concentrates were seen coming out; nozzles were seen coming out; and clear liquid was seen coming out*.

In part (e), the candidates failed to state the part of the sprayer responsible for forming the liquid pattern observed in part (d). Incorrect responses included: *valve, sprayer, agitator, pump,* and *on-off lever*. Moreover, in part (f), the candidates failed to explain the maintenance required for the nozzles of the knapsack sprayer. Instead, most of them listed general maintenance procedures for the sprayer, such as: *wash after use; replace any broken handle; ensure proper storage; unblock the lance if clogged;* and *fix the internal pump if pressure is low*.

In part (g), the candidates failed to give the correct factors to consider when carrying out procedures (i)–(iii) in the field when controlling pests. Most of them mentioned various incorrect responses such as: *they improve crop quality, reduce production costs, and reduce pest burdens*. A few candidates listed steps for preparing the knapsack sprayer for use, such as: *fill the sprayer with clean water; add chemical at recommended quantity; mix well; calculate the application rate; adjust working pressure; carry it on the back; and apply in the field*. These responses demonstrate a lack of understanding of the actual demand of the question. Extract 23.2 presents a sample of the incorrect responses provided by one of the candidates.

3f) The partten of liquid observed coming out is liquid solution which caused by pressure mechanism that are described.

e) The part of the sprayer responsible for making liquid pattern in part (d) is Hose and spray lances.

3g) Factor to be considered in controlling pest are;

(i) Fertility of the soil; Before any application of the procedure given above the farmer must look for the fertility of the soil hence can determine the way of controlling the pest in their farm.

(ii) Method to be used; This is due to fact that the farmer must choose a good method that can be important used in controlling the pest on their farm with which can have less environmental factor.

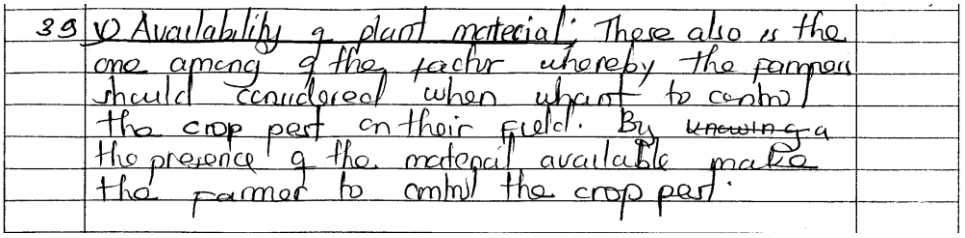
(iii) Soil condition: The condition of the soil also should be considered also especially when what to control the crop pest. The farmer must look for the condition of the soil.

(iv) Implement used; Farmers can also able to determine the implement that can be used during the crop pest control. This may be very important to the farmers on the better using of the method.

03: (a) When pumping the operating handle the liquid is forced create pressure to force the liquid through the nozzle, while before pumping there were no liquid that come in the nozzle.

(b) The implication of difference obtain in (a) is poor of the distribution of liquid solution to the targeted plant or area when applied.

(c) The on-off lever not pressed before and during pumping the operating handle because of the insufficient droplet of the liquid solution which is not sufficiency to the planted crop.



Extract 23.2: A sample of the candidates' incorrect responses to question 3.

Extract 23.2 presents responses from a candidate who provided incorrect responses to all parts of the question, signifying a lack of subject matter knowledge and skills.

3.0 ANALYSIS OF THE CANDIDATES' PERFORMANCE IN EACH TOPIC

This section analyses candidates' performance in each topic. The Agriculture examination covered a total of 19 topics. An analysis of performance statistics shows that out of these, 10 topics had good performance, 7 topics had average performance, and 2 topics had weak performance. The topics with good performance were: *Environmental and Technological Challenges in Agricultural Development* (94.42%) *Introduction to Animal Health* (93.42%), *Farm Mechanisation and Machinery* (89.12%), *Workshop Technology and Farm Structures* (88.12%), *Introduction to Soil Science* (86.66%), *Farm Planning* (75.11%), *Plant Breeding* (74.41%), *Plant Diseases* (71.16%), and *Introduction to Agricultural Production Economics* (66.00%).

Topics with average performance were: *Introduction to Animal Nutrition* (55.85%), *Introduction to Weed Science* (51.56%), *Fundamentals of International Trade* (50.00%), *Crop Pests* (47.44%), *Livestock Reproduction, Breeding and Improvement* (46.56%), *Pasture Agronomy* (38.21%) and *Introduction to Irrigation* (38.12%). Additionally, the topics of *Introduction to Soil Chemistry* and *Farm Power* recorded weak performance, with scores of 33.18% and 32.82% respectively. See Appendix

A comparison of candidates' performance in different topics between 2024 and 2025 shows that some topics improved while others declined. This analysis highlights the areas in which candidates excelled and those that require pedagogical reinforcement.

Several topics showed notable improvement in 2025 compared to 2024, reflecting better performance by a different groups of candidates. For example, *Environmental and Technological Challenges in Agricultural Development* improved from 88.91% in 2024 to 94.42% in 2025, maintaining a good rating and recording a gain of 5.51 percentage points. Similarly, performance in *Introduction to Animal Health* increased slightly from 91.45% to 93.42%, indicating that the 2025 candidates also demonstrated a strong understanding of the topic.

The biggest improvements were seen in topics that had previously recorded only average performance. *Plant Breeding* rose from 48.04% to 74.41%, shifting from an average to a good performance level. Similarly, *Plant Diseases* increased from 47.42% to 71.16%, indicating stronger candidate performance. A significant change also occurred in *Farm Planning*, where performance improved from 37.88% in 2024 to 75.11% in 2025, nearly doubling. These gains suggest that the 2025 candidates were more competent in these topics compared to those in 2024.

However, despite these gains, a number of topics exhibited considerable performance declines in 2025**.** *Agricultural Production Economics*, which had an excellent performance of 98.15% in 2024, dropped significantly to 66.00%, a decline of 32.15 percentage points, although still within the good category. A sharp decline was also recorded in *Livestock Reproduction, Breeding and Improvement*, which fell from 95.03% to 46.56%, moving from good to average.

Introduction to Animal Nutrition experienced a drop from 65.82% to 55.85%, moving from the good to the average category. Similarly, *Pasture Agronomy* fell dramatically from 79.10% to 38.21%, representing a drop of over 40 percentage points. Furthermore, *Introduction to Weed Science* declined from 87.76% to 51.56%, moving from good to average. The most severe declines were observed in *Introduction to Soil Chemistry* and *Farm Power*, both of which dropped from good to weak. *Soil Chemistry* declined from 75.86% to 33.18%, while *Farm Power* dropped from 83.83% to 32.82%, indicating a lack of competence in the topics.

Introduction to Irrigation also suffered a drastic performance fall, moving from a strong 95.96% in 2024 to only 38.12% in 2025, moving it to the

average category. Although *Workshop Technology and Farm Structures* also declined from 97.46% to 88.12%, it remained within the good performance.

In terms of relative stability, the topic of Crop Pest showed minor changes in performance levels. It remained largely unchanged, moving only slightly from 45.27% to 47.44%, and consistently stayed within the average performance range.

In conclusion, the 2025 performance analysis reveals a mixed trend. While some topics like *Plant Breeding*, *Plant Diseases*, and *Farm Planning* showed impressive improvement, several others including *Introduction to Soil Chemistry*, *Farm Power*, *Introduction to Irrigation*, and *Introduction to Weed Science* experienced significant declines. This suggests that although candidates made notable progress in certain areas, there is still a need for targeted interventions to address the challenges in topics where performance dropped.

4.0 CONCLUSION AND RECOMMENDATIONS

This section gives the findings of the analysis and suggestions for improving candidates' performance in future examinations.

4.1 Conclusion

Despite the overall good performance in ACSEE 2025, with no candidate failing, the data indicate that most candidates (77.15%) scored low pass marks, resulting in lower passing grades.

An analysis of responses from candidates who scored low marks reveals several contributing factors. These include a lack of understanding of key concepts, inadequate comprehension, misinterpretation of questions, and insufficient practical skills. These issues were the main causes of weak performance among this group.

Candidates who lacked a clear understanding of the concepts were unable to provide accurate or relevant answers. This often led them to guess or give entirely incorrect responses, which resulted in low scores.

In some cases, candidates demonstrated only partial understanding of the concepts. Although they could recall certain facts, they struggled to apply

them appropriately in context or to respond to multi-part questions. This limited their ability to earn higher marks.

Misinterpretation of concepts also contributed to poor performance. Some candidates misunderstood the questions or the subject matter itself, leading them to provide confidently incorrect answers that further reduced their scores.

Additionally, candidates with insufficient practical skills lacked the hands-on experience required to perform well in practical-based questions. As a result, their performance in this area was poor, which negatively impacted their overall marks.

On the contrary, 22.85 per cent of the candidates scored high pass marks, resulting in higher passing grades. This strong performance was attributed to their good understanding of key concepts and sufficient practical skills. A solid grasp of the concepts enabled these candidates to interpret questions correctly and provide accurate, well-structured responses. In addition, their practical competence allowed them to carry out tasks effectively and answer practical-based questions with confidence, thereby improving their overall scores.

4.2 Recommendations

To improve performance in the topics with poor results in the Agriculture subject, teachers are advised to:

(a) use various teaching methods for the topic of *Farm Power*, especially on tractor engine systems, such as:

(i) demonstrating how various systems of a tractor engine work.
(ii) guiding students to participate in basic maintenance of tractor engine systems and in operating the tractor.
(iii) using pictures, diagrams, and videos showing different tractor engine systems.
(iv) organizing field visits to observe how various systems of tractor engines operate on farms.

These teaching approaches will help students easily understand concepts related to tractor engine systems and prepare them to apply the knowledge in real agricultural work environments.

(b) use different teaching methods to enable students understand the advantages of foliar fertilisers compared to soil-applied fertilisers under the topic of *Introduction to Soil Chemistry*, such as:

(i) leading student discussions to compare the benefits of each type of fertiliser.
(ii) demonstrating how to apply foliar fertilisers and how to apply soil fertilisers.
(iii) guiding students to plant crops using different fertilisers and monitor the results.
(iv) visiting farms that use both fertilisation methods.
(v) allowing students to ask and answer questions.

Using these teaching methods will help students understand the benefits of foliar fertilisers compared to soil-applied ones, develop skills in analysing fertiliser application outcomes, and build the capacity to make appropriate decisions in practical agricultural fertilisation.

(c) use different teaching methods to enable students understand how to identify and control grass weeds under the topic *Introduction to Weed Science*, such as:

(i) guiding students to observe and differentiate grass weeds from broadleaf and sedge weeds using live samples or pictures.
(ii) demonstrating the distinguishing features of common grass weeds such as leaf arrangement, ligules, auricles, and root systems.
(iii) organizing field visits for students to identify various grass weeds in actual crop fields.
(iv) involving students in mechanical removal of grass weeds during practical sessions.
(v) demonstrating the proper use of herbicides specific to grass weeds, including safety precautions.
(vi) leading class discussions on integrated weed management strategies and their effectiveness in controlling grass weeds.

These teaching strategies will help students gain hands-on experience in identifying grass weeds and selecting appropriate control methods, thereby improving their understanding and performance in weed science.

The effective implementation of learner-centred teaching methods in the topics of Farm Power, Soil Chemistry, and Weed Science is essential for improving students' understanding and performance. These methods actively engage learners in the teaching and learning process, enhance their conceptual understanding and practical skills, and ultimately lead to better outcomes in Agriculture examinations.

Appendix

Candidates' Performance on the Topics in ACSEE 2025

S/N	Topics	Question No.	Percentage of the Candidates who scored an average of 35% or above	Comments
1.	Environmental and Technological Challenges in Agricultural Development	10 (2)	94.42	Good
2.	Introduction to Animal Health	6 (P2), 2 (P3)	93.42	Good
3.	Farm Mechanisation and Machinery	3 (P3)	89.12	Good
4.	Workshop Technology and Farm Structures	1 (P1)	88.12	Good
5.	Introduction to Soil Science	4,5 (P1)	86.66	Good
6.	Farm Planning	8 (P1)	75.11	Good
7.	Plant Breeding	5 (P2)	74.41	Good
8.	Plant diseases	1,2 (P2)	71.16	Good
9.	Introduction to Agricultural Production Economics	10 (P1)	66.00	Good
10.	Introduction to Animal Nutrition	7 (P2)	55.85	Average
11.	Introduction to Weed Science	4 (P2), 1 (P3)	51.56	Average

S/N	Topics	Question No.	Percentage of the Candidates who scored an average of 35% or above	Comments
12.	Fundamentals of International Trade	9 (P1)	50.00	Average
13.	Crop Pests	3 (P2)	47.44	Average
14.	Livestock Reproduction, Breeding and Improvement	9 (P2)	46.56	Average
15.	Pasture Agronomy	8 (P2)	38.21	Average
16.	Introduction to Irrigation	3 (P1)	38.12	Average
17.	Introduction to Soil Chemistry	6,7 (P1)	33.18	Weak
18.	Farm Power	2 (P1)	32.82	Weak

KEY:
P 1 – PAPER 1
P 2 – PAPER 2
P 3 – PAPER 3