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

# CANDIDATES' ITEM RESPONSE ANALYSIS REPORT ON THE CERTIFICATE OF SECONDARY EDUCATION EXAMINATION (CSEE) 2020

# AGRICULTURAL SCIENCE

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# CANDIDATES' ITEM RESPONSE ANALYSIS REPORT ON THE CERTIFICATE OF SECONDARY EDUCATION EXAMINATION (CSEE) 2020

# 034 AGRICULTURAL SCIENCE

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## FOREWORD

The Agricultural Science Candidates' Item Response Analysis report on the Form Four National Examination (CSEE) 2020 is written to provide feedback to candidates, teachers, parents, policy makers and other education stakeholders on the candidates' performance in this subject.

The CSEE is a summative evaluation in secondary education, which among other things, shows the effectiveness of the education system in general and the education delivery system in particular. Essentially, candidates' responses in the examination are a strong indicator of what the education system was able or unable to offer to the students in their four years of study.

The report intends to provide a clear understanding of the reasons behind the candidates' success or failure in answering questions in Agriculture Science subject examination. The reasons for scoring low marks in some of the questions include; inadequate knowledge of the subject matter, lack of field practical skills, failure to fulfil the requirements of the questions and low English Language proficiency. On the other hand, the attainment of high marks in the examination by some candidates was attributed to adequate knowledge of the subject matter and enough field practical skills.

Moreover, the report offers recommendations on how to improve the performance of the candidates. Therefore, it is expected that, the feedback provided in this report will enable education stakeholders to improve the teaching and learning process to improve candidates' performance in future National Examinations.

The Council would like to thank examination officers, examiners and all who participated in the preparation of this report.

Dr. Charles E. Msonde.
**EXECUTIVE SECRETARY**

## 1.0 INTRODUCTION

This report presents the performance of the candidates who sat for the Form Four National Examination in Agricultural Science subject in the year 2020. The examination was set according to the 2019 examination format which is based on the 1997 Agricultural Science syllabus.

The examination consisted of two papers, 034/1 Agricultural Science 1 (theory paper) and 034/2 Agricultural Science 2 (practical paper). The theory paper consisted of sections A, B and C which carried a total of 100 marks. Section A had two objective questions, Multiple-Choice Items and Matching Items in question 1 and 2, respectively. Multiple Choice question consisted of ten items, each carrying 1 mark, thus making a total of 10 marks for the question. Matching Items question consisted of five items each carrying 1 mark, making a total of 5 marks for the question. The candidates were required to answer all the questions in this section. The section carried a total of 15 marks. Section B comprised seven short answer questions each carrying 10 marks making a total of 70 marks in this section. The candidates were required to answer all the questions in this section. Section C had two essay questions each carrying 15 marks. The candidates were required to answer only one question. The section carried a total 15 marks.

The practical paper consisted of two short answer questions, each carrying 25 marks, making a total of 50 marks. The candidates were required to answer all the questions.

A total of 6,811 candidates sat for Agricultural Science examination this year. The data shows that 5,453 (80.06%) candidates passed, and 1,358 (19.94%) failed the examination. The majority of the candidates who passed the examination scored grades C and D. However, the analysis of results indicates a rise of 15.33 per cent compared to the year 2019. Table 1 summarizes the performance of the candidates who sat for CSEE 2020 in terms of grade.

**Table 1**: Candidates' Performance by Grades in Agricultural Science CSEE 2020

| **Grades** | **A** | **B** | **C** | **D** | **F** | **Total** |
|---|---|---|---|---|---|---|
| **Male** | 25 | 148 | 1,704 | 1,165 | 483 | 3525 |
| **Female** | 3 | 39 | 1,057 | 1,312 | 875 | 3286 |
| **Total** | 28 | 187 | 2,761 | 2,477 | 1,358 | 6,811 |

**Source**: NECTA Statistics Book, page 8 CSEE, 2020

The next section presents the analysis of the candidates' performance in each question. The analysis highlights each question's requirements, the general performance of the candidates in each question, the candidates' responses and possible reasons for their performance. Extracts representing samples of candidates' responses in each question have been included to illustrate the cases presented. In the analysis, the performance is considered poor, average or good if the percentage of candidates' scores ranges between 0-29, 30-64 and 65-100, respectively.

## 2.0 THE ANALYSIS OF THE CANDIDATES' PERFORMANCE IN EACH QUESTION

### 2.1 034/1- AGRICULTURAL SCIENCE 1

#### 2.1.1 Question 1: Multiple-Choice Items

This question consisted of ten items drawn from the topics of Farm Power, Farming Systems, Poultry Farming, Environmental Degradation, Principles of Livestock Production, Production of Horticultural Crops, Agricultural Marketing and Price and its Determinants in the Agricultural Science syllabus. Each item carried 1 mark, making a total of 10 marks. The candidates were required to choose the correct option from among the given five alternatives and write its letter beside the item number in the answer booklet provided.

The question was attempted by 6,886 (100%) candidates; of which 700 (10.2%) scored from 0 to 2 marks, 4,837 (70.2%) scored from 3 to 6 marks and 1,349 (19.6%) scored from 7 to 10 marks. Figure 1.1 shows the distribution of the candidates' scores in the question.

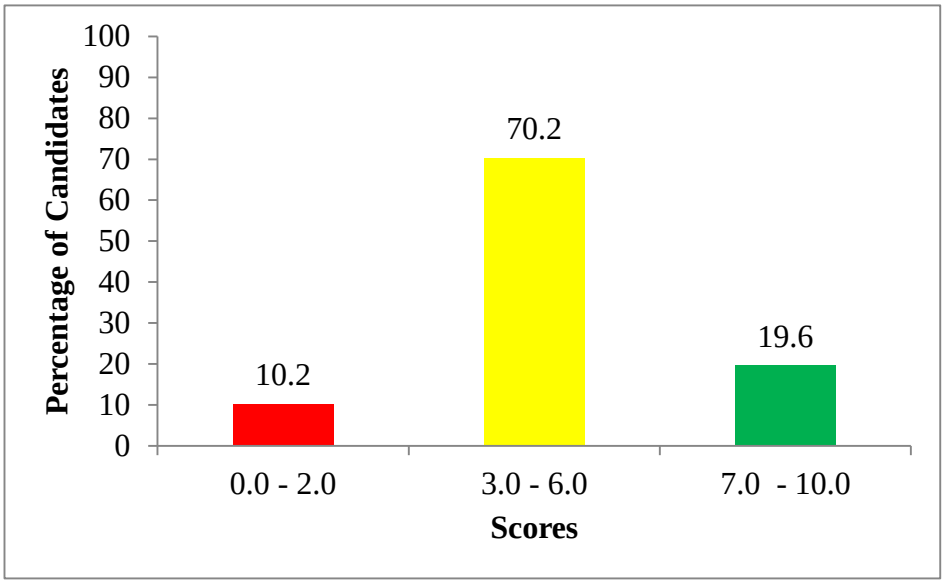



**Figure 1.1:** *The distribution of scores in question 1.*

Figure 1.1 indicates that, the majority (70.2%) of the candidates scored average marks (3.0-6.0) and a few (10.2%) scored low marks (0.0-2.0). However, the general performance was good since the majority (89.8%) scored from 3 to 10 marks.

The analysis of the candidates' responses reveals that, most of the candidates provided correct responses in item (i), (ii), (iii), (iv), (v) and (ix). However, the candidates provided incorrect responses in item (vi), (vii), (viii) and (x). The analysis of the candidates' responses in each item is as follows:

In item (i), the candidates were required to choose an option representing a device for transmitting power from the oxen to the ox-equipment. The alternatives given were; A (Beam), B (Skey), C (Harness), D (Strap) and E (U-bolt). The item tested the candidates' understanding of the function of harness and its parts. The correct response was C, (Harness). The majority of the candidates provided the correct response indicating a good understanding of the function of the harness and its parts. The candidates who chose A, (Beam) were unaware that, it is a piece of wood in a yoke harness which is placed on the neck of oxen. Those who chose B, (Skey) did not know that, this is a part of the harness made up of wood fitted into the beam. Those who chose D, (Strap) did not understand that, this is a part of

the harness which is tied on skeys below the neck. Furthermore, the candidates who chose E, (U-bolt) were unaware that, this is part of the harness fixed to the centre of the beam to provide a means of hitching an implement to the yoke.

Item (ii) required the candidates to choose an alternative that represents a tractor engine parts that belong to the reciprocating parts among A (Engine block and crankcase), B (Crankcase and piston), C (Piston and flywheel), D (Piston and connecting rod) and E (Connecting rod and flywheel). The item tested the candidates' knowledge of the tractor engine parts. The correct response was D, (Piston and connecting rod). The majority of the candidates provided correct response implying the possession of adequate knowledge of the tractor engine parts. The candidates who chose different distractors were unaware that, the engine block and the crank case are stationary parts of the engine and fly wheel is a rotary engine part.

In item (iii), the candidates were required to choose an alternative that represents a reason for discouraging the system of shifting cultivation. The item tested the candidates' understanding of the system of shifting cultivation and its disadvantages. The correct response was D, (It involves cleaning the land by cutting trees). The majority of the candidates chose the correct response. These candidates were aware that, shifting cultivation involves clearing the vegetation in an area and cultivating it for few years before abandoning it for new area. The candidates understood that, cleaning of land by cutting trees is not good. On the other hand, the candidates who chose A (It is not possible to use oxen and tractor) did not know that, clearing the vegetation and cultivation of land in shifting cultivation can employ mechanization too. Those who opted B (It need complicated knowledge on farming) were unaware that, shifting cultivation does not require complicated knowledge as this applies in intensive farming where production is maximized in small areas. The candidates who chose C (There are high incidences of pests and diseases) did not understand that, in shifting cultivation, the incidence of pests and diseases are greatly minimized due to movements from one area to another. Moreover, those who chose E (It incurs very high cost in production) did not know that, high cost of production is incurred in intensive farming where high technology is necessary.

Item (iv) required the candidates to identify the disease which is characterized by greenish diarrhoea from a chicken. The item examined the candidates' knowledge of poultry diseases. The correct response was A, (Newcastle disease). Most of the candidates gave correct response. This signifies a good understanding of the symptoms of poultry diseases. On the other hand, the candidates who chose B (Fowl plague) did not know that, the disease is mainly characterized by the birds walking backwards and hiding their heads and stand with their neck twisted. Those who chose C (Avian leucosis) were unaware that the symptoms of the disease are anorexia, depression, wasting and sudden death. Likewise, the candidates who chose D (Infectious coryza) failed to understand that, the main symptoms of the disease are nasal discharge, swelling of the face and sneezing. Similarly, the candidates who opted for E (Coccidiosis) lacked an understanding that, the disease is mainly characterized by blood-stained faeces.

In item (v), the candidates were required to choose an option that represents an ideal soil that is composed of approximately 40% sand, 40% silt and 20% clay. The item examined the candidates' knowledge of soil textural classes. The correct option was A, (Loam). The majority of the candidates did well in this item implying possession of adequate knowledge of relative proportions of soil particles in a soil sample. On the contrary, the candidates who chose B (Sand) were supposed to know that, sand soil contains 70 percent or more sand separates. Those who chose C (Silt) were supposed to know that, this is a soil separate which does not fall into any textural class. Likewise, the candidates who opted for D (Clay) should understand that, the soil contains more than 30 percent clay separates and those who chose E (Sand-silt) should know that, there is no such soil textural class.

Item (vi) required the candidates to identify the parasites that can be controlled by drenching. The item tested the candidates' understanding of control of animal parasites. The correct alternative was E, (Tapeworms and Liverflukes). However, majority of the candidates provided incorrect responses indicating possession of inadequate knowledge on how different animal parasites can be controlled. The candidates who provided incorrect responses did not know that, drenching is the process of giving drugs to animals through the mouth. In this case, it is only internal parasites (Tape worms and Liver flukes) that can be controlled by drenching. All other parasites in the distractors were external parasites.

Item (vii) required the candidates to identify the methods used in controlling blossom end rot in tomato plants. The options provided were: A (Avoiding the application of an excessive quantity of nitrogenous fertilizers and regular watering of plants), B (Spraying tomato plants with mancozeb starting from seedlings emergence and using certified seeds and crop rotation), C (Avoiding the application of an excessive quantity of nitrogenous fertilizers and using resistant varieties or tolerant varieties), D (using resistant varieties and regular watering of the plants) and E (Regular watering of plants and using certified seeds and crop rotation). The item tested the candidates' understanding of plant diseases and their control. The correct response was A, (Avoiding the application of an excessive quantity of nitrogenous fertilizers and regular watering of plants). Most of the candidates chose incorrect options, justifying their lack of knowledge and skills in the control measures of blossom end rot in tomato plants. The candidates did not understand that, blossom end rot is a physiological disease caused by too much nitrogen in the early stage and irregular watering, thus the disease can be controlled by avoiding such practices. A physiological plant disease is caused by non-pathological conditions; hence its control measure does not involve dealing with pathogens. The distractors (B, C, D and E) contained a mixture of control measures for pathological and non-pathological diseases. For example, apart from avoiding applying an excessive quantity of nitrogenous fertilizer in C and regular watering of plants in D and E, which were for non-pathological diseases, the rest were control measures for pathological diseases.

In item (viii), the candidates were required to choose an option with the name given to the market type in which a single seller controls the whole market. The item tested the candidates' knowledge of agricultural markets and their characteristics. The correct response was C, (Monopoly). However, most of the candidates chose incorrect responses signifying their lack of knowledge of the characteristics of different agricultural markets. The candidates who opted for A (Pure competition) did not understand that, this is a market in which there are many sellers and buyers for a commodity. Those who opted for B (Oligopoly) were unaware that, this is a market in which there are several firms selling similar products. The candidates who chose D (Black market) lacked an understanding that, this is a market that occurs when there is a scarcity of a particular product in question.

Furthermore, the candidates who opted for E (Monopsony) were not familiar that, this is a market in which there is a single buyer of a particular product.

Item (ix) required the candidates to choose an alternative with the material that can be recycled to make water or land free from pollution. The alternatives given were: A (Fiber materials like sisal bags), B (Plastic material like plastic bags, plastic bottles, plastic chairs and plastic baskets), C (Cotton material like used piece of clothes), D (Kitchen wastes) and E (Crop residues from the farm). The item examined candidates understanding of the causes and control of pollution. The correct response was B, (Plastic material like plastic bags, plastic bottles, plastic chairs and plastic baskets). Most of the candidates chose the correct response. This suggests that, the candidates had a good understanding of pollutants and their control. The candidates who chose other options did not understand that, such materials cannot be recycled but can be buried to decompose.

In item (x), the candidates were required to choose an option with the type of elastic supply curve, which can be drawn from the following supply schedule:

| **Price (Tshs)** | **Quantity Supplied (Kg)** |
|---|---|
| 100,000 | 100 |
| 200,000 | 100 |
| 300,000 | 100 |
| 400,000 | 100 |
| 500,000 | 100 |

The item tested the candidates' understanding of elasticity. The correct option was B, (Perfect inelastic supply curve). This is a curve which stands vertically showing that, there is no change in quantity supplied when the price changes. Most of the candidates chose distractors. Such candidates had inadequate knowledge of the types of elastic supply curves. They failed to draw and interpret the curves. The candidates who chose A, (Perfect elastic supply curve) were unaware that; this is a curve, which lies horizontally: showing that; any change in price results in an infinite amount of change in

quantity. Those who opted for C (Elastic supply curve) did not understand that; this is a curve, which slopes downward to the right: showing that, the quantity supplied responds to price changes in a greater than proportional manner. The candidates who chose D (Inelastic supply curve) failed to understand that; this is a curve, which slopes downward to the right: showing that, the percentage change in price will cause a smaller percentage in quantity supplied. Similarly, those who opted for E (Unitary elastic supply curve) lacked an understanding that; this is a curve, which slopes downward to the right: showing that, the percentage increase in quantity supplied is the same as the percentage increase in price.

### 2.1.2 Question 2: Matching Items

The question consisted of five items from the topic of Farm Surveying and Mapping. Each item carried 1 mark, making a total of 5 marks. The candidates were required to match the items in list A with their respective responses in list B by writing a letter of the correct response beside the item number in the answer booklet. List A comprised five functions of different surveying instruments whereas list B comprised seven surveying instruments.

| List A | List B |
|---|---|
| (i) An instrument used to mark temporary stations when surveying.<br>(ii) An instrument used to align survey lines on the ground.<br>(iii) An instrument used to indicate a vertical position of a point.<br>(iv) An instrument used together with level to measure the vertical distances above the reference place.<br>(v) An instrument used to uphold levels. | A. Plumb bob<br>B. Odometer<br>C. Arrow<br>D. Tripod level<br>E. Ranging pole<br>F. Abney level<br>G. Levelling staff |

The question tested the candidates' understanding of the functions of different surveying instruments.

The question was attempted by 6,886 (100%) candidates, out of which 2,256 (32.8%) scored from 0 to 1 mark, 3,526 (51.2%) scored from 2 to 3 marks and 1,104 (16%) scored from 4 to 5 marks. The general performance in this question was good. Figure 1.2 illustrates the scores of the candidates in the question.

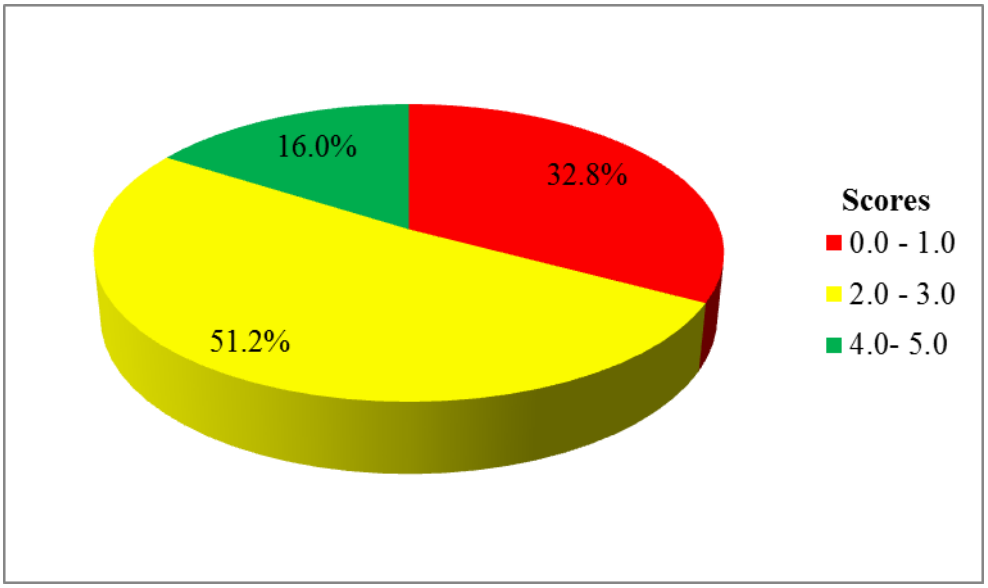



**Figure 1.2:** *The distribution of scores in question 2.*

As figure 1.2 shows, the majority of the candidates (67.2%) scored from 2 to 5 marks, whereas 32.8 percent scored low marks (0-1).

The analysis of the candidates' responses shows that; most of the candidates performed well in items (i), (ii), and (v) and failed in items (iii) and (iv). The analysis of candidates' performance in each item is given in subsequent paragraphs.

In item (i), the majority of the candidates provided the correct response which was C, (Arrow), an instrument used for marking temporary stations when surveying. Those who provided incorrect responses were attracted to

option E, (Ranging pole), because they did not understand that; ranging poles are instruments used for aligning survey line on the ground.

In item (ii), the majority of the candidates chose correct response E, (Ranging pole), an instrument used for aligning survey lines on the ground. Some of the candidates mixed up the function of ranging pole with that of an arrow hence opted for C. Such candidates were unaware that an arrow is an instrument used for marking temporary stations when surveying.

In item (iii), the majority of the candidates failed. The correct response was A, (Plumb bob), which is an instrument used for indicating a vertical position of a point. However, most of the candidates who attempted the item incorrectly opted for G, (Levelling staff). The candidates were not familiar that, levelling staff is an instrument used together with level for measuring the vertical distance above the reference place.

In item (iv), most of the candidates provided incorrect responses. The correct response was G, (levelling staff) as an instrument used for measuring the vertical distance above the reference point. The majority of the candidates who provided incorrect responses chose A, (Plumb bob). The candidates failed to understand that; the plumb bob is an instrument used for indicating vertical position of a point.

In item (v), most of the candidates provided the correct response, which was D (Tripod level), an instrument used for upholding levels. Most of the candidates who provided incorrect responses were attracted to F, (Abney level) without knowing that, this is an instrument used for seeing bubbles in the level while sighting a distant target.

## 2.2 SECTION B: Short Answer Questions

### 2.2.1 Question 3: Farm Surveying and Mapping

The question had two parts; (a) and (b), carrying a total of 10 marks. The candidates were required to: (a) state five objectives of the land survey and (b) briefly explain the functions of any five instruments used in chaining or taping. The question examined the candidates' knowledge of the objectives of conducting the land survey and the functions of various surveying instruments.

The question was attempted by 6851 (99.4%) candidates, whereas 1,008 (14.7%) scored from 0 to 2.5 marks, 3,093 (45.2%) scored from 3 to 6 marks and 2,750 (40.1%) scored from 6.5 to 10 marks. The candidates' performance in the question was good. Figure 1.3 represents the candidates' scores in the question.

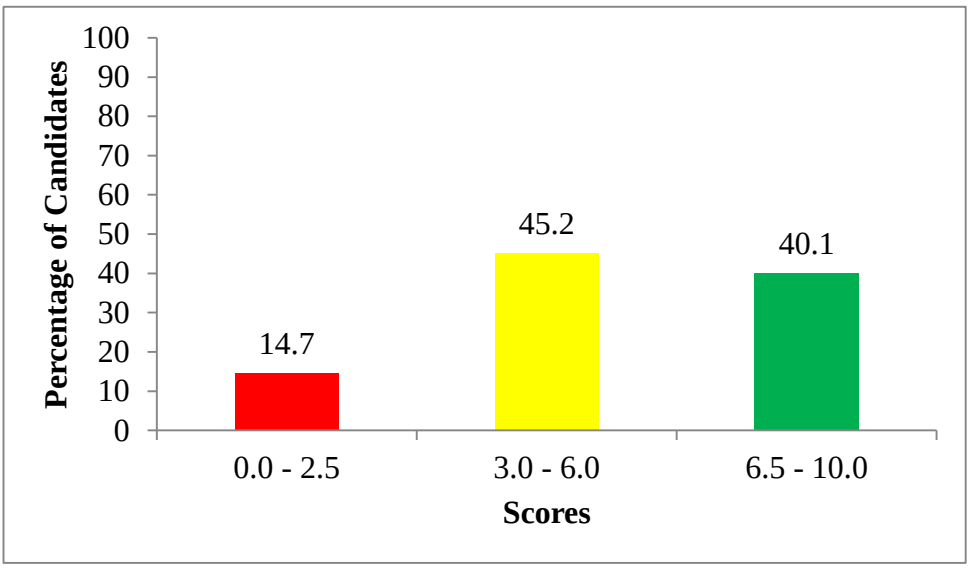
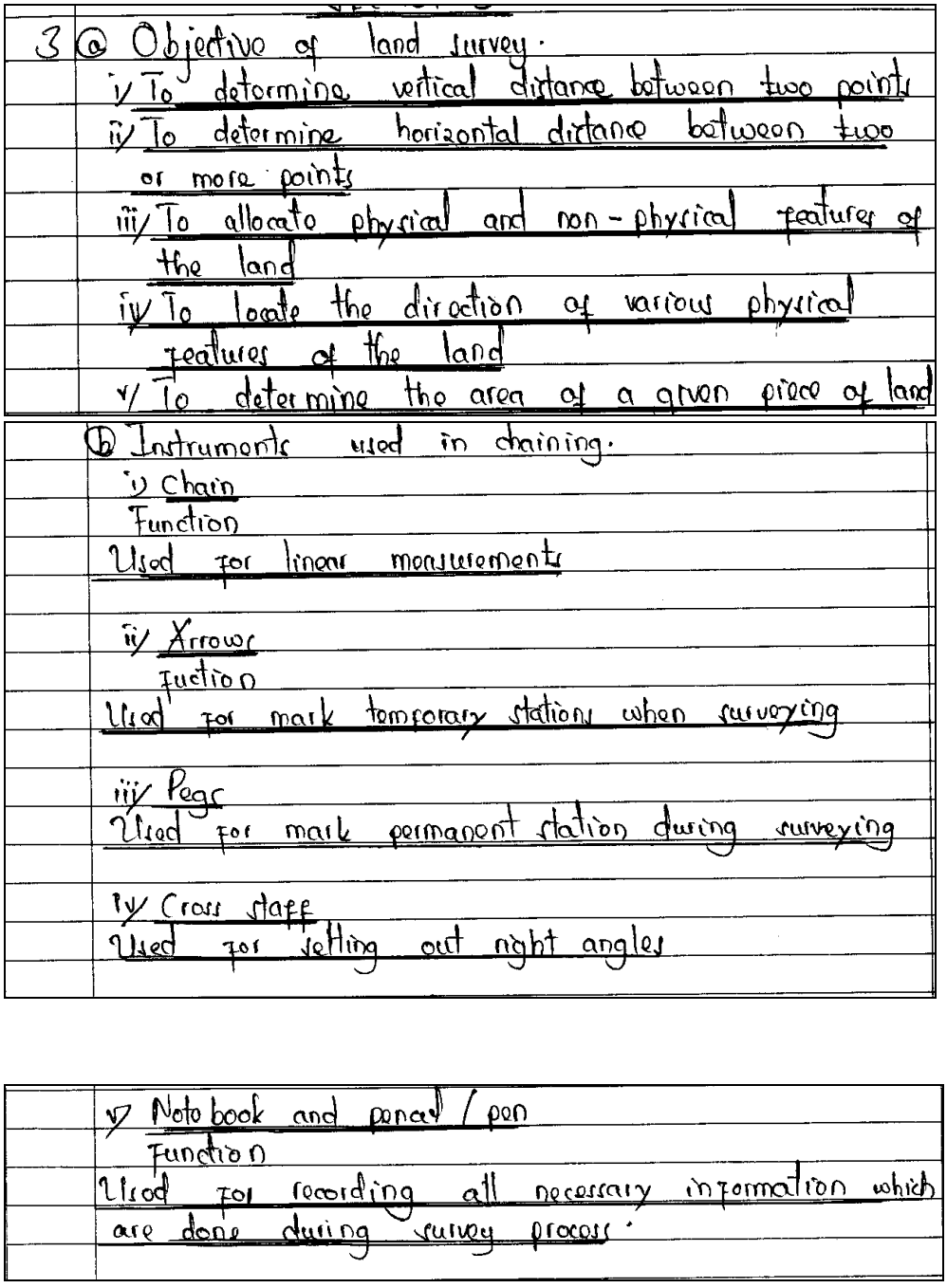



**Figure 1.3:** *The distribution of candidates' scores in question 3.*

Figure 1.3 shows that; a total of 85.3 percent of the candidates scored from 3 to 10 marks and 14.7 percent scored from 0 to 2.5 marks.

The data analysis indicates that; 40.1 percent of the candidates who attempted the question had a good performance. The analysis shows that; most of them provided correct responses in almost all parts of the question. In part (a), they correctly stated the objectives of land survey, such as; measures vertical and horizontal distances between two points, determine the area of a piece of land and locates various features on the surface of the land. Furthermore, the candidates explained well the functions of instruments used in chaining/taping in part (b). The functions include; chains are used for measuring distance, arrows are used to mark temporary stations during surveying: and ranging poles for aligning survey lines on the ground. This indicates that; the candidates had adequate knowledge of the objectives of surveying and functions of the instruments used in the chain survey. Extract 1.1.1 represents a sample of good responses in the question.




**Extract 1.1.1**: *A sample of good responses in question 3.*

In Extract 1.1.1, the candidate provided correct responses in both parts of the question.

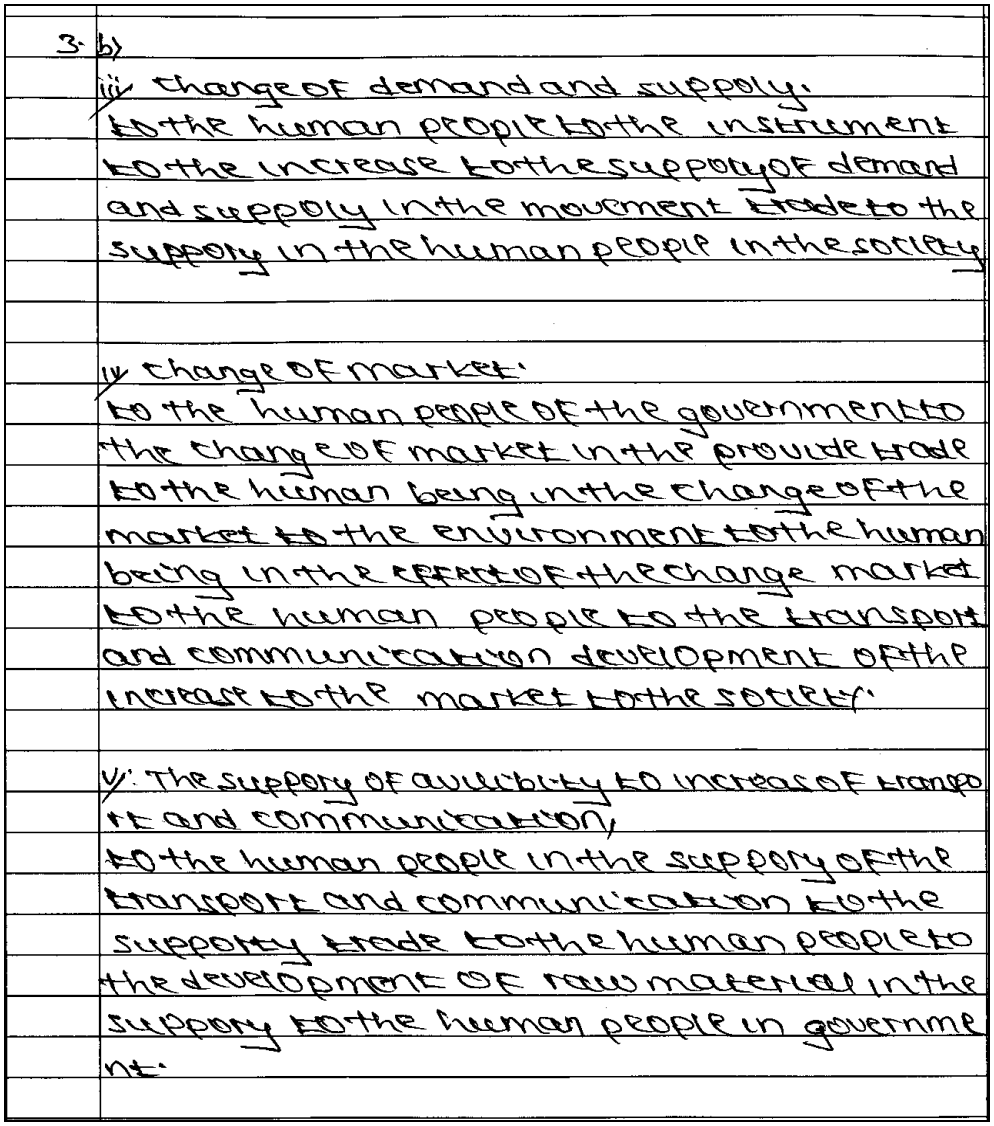
The analysis further shows that, 45.2 percent of the candidates performed averagely in the question. The responses' analysis shows that the candidates in this category did well in part (a), but failed to exhaust all correct points in part (b). It appears that the candidates possessed a good understanding of the objectives than of the functions of the instruments used in the chain survey.

On the other hand, 14.7 percent of the candidates who attempted the question had a weak performance. The majority of these candidates provided incorrect responses in almost both parts of the question. In part (a), they failed to state the objectives of the land survey. Examples of incorrect responses provided were: *to maintain formation between mapped areas, to improve the new technology, to reduce conflict in the society, enable a person on how to survey an area, improve living standard of the people* and *to measure the area*. The responses provided suggest the lack of an understanding of the objectives of the land survey. Likewise, the candidates failed to explain the functions of the instruments used in the chain survey in part (b). Most of the instruments presented were not surveying instruments and few of the surveying instruments given were not specifically for the chain survey. Some of the candidates provided incorrect functions of the chain survey instruments though they named the instruments correctly. Some of the incorrect responses provided were such as; *odometer these instrument are used in surveying line on the ground, plain table this instrument are used to flat land during surveying activity and surveyor's band used to linear measurement, arrow used take the point of survey, vice is used to measure distance, pole is used change direction of survey* and *chain saw used for measuring wood.* This implies that, the candidates lacked understanding of the functions of the chain survey instruments. Moreover, they lacked field practice where they could have observed and practised the use of the instruments. Extract 1.1.2 is another sample of poor responses from one of the candidates.

3. (a)
i. to the increase of population.
ii. to the support of the small age.
iii. to the increase of survey in the environment.
iv. to the increase data or information to the people.
v. to the transport of raw material.

b. i. Change of technology.
to the human people in the movement from one place to another in the development of technology to the society.

ii. Change of government.
to the government in the change of the human people in the society to the change government in the not support of the human people in the environment to the support of government to the statement




**Extract 1.1.2:** *A sample of poor responses in question 3.*

In Extract 1.1.2, the candidate gave incorrect responses in all parts of the question.

### 2.2.2 Question 4: Poultry Farming

The question consisted of part (a) and (b), carrying a total of 10 marks. The candidates were required to: (a) briefly explain the behaviour which will be shown by the chicks in the brooder house under the following temperature conditions: (i) too hot, (ii) too cold; (iii) air draughts and (iv) right temperature; and (b) give six points why it is advantageous to keep poultry

using a free range system. The question tested the candidates' understanding of behaviour shown by chicks in the brooder house in various conditions; and to state the advantages of keeping poultry using a free range system.

The question was attempted by 6,841 (93.3%) candidates, whereby 1,868 (27.3%) scored from 0 to 2.5 marks, 2,652 (38.8%) scored from 3 to 6 marks and 2,321 (33.9%) scored from 6.5 to 10 marks. The general performance of the candidates in the question was good. Figure 1.4 summarizes the candidates' scores in the question.

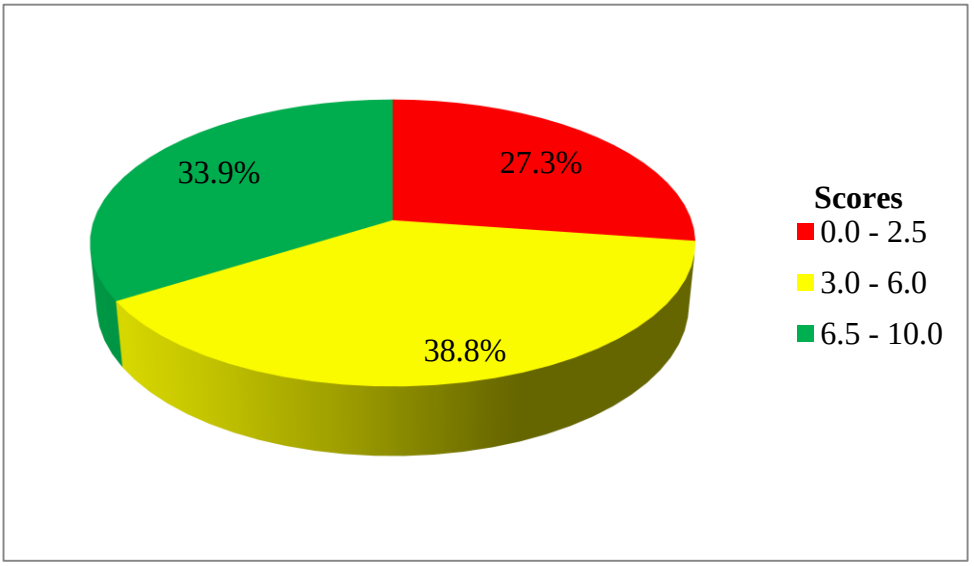



**Figure 1.4:** *The distribution of candidates' scores in question 4.*

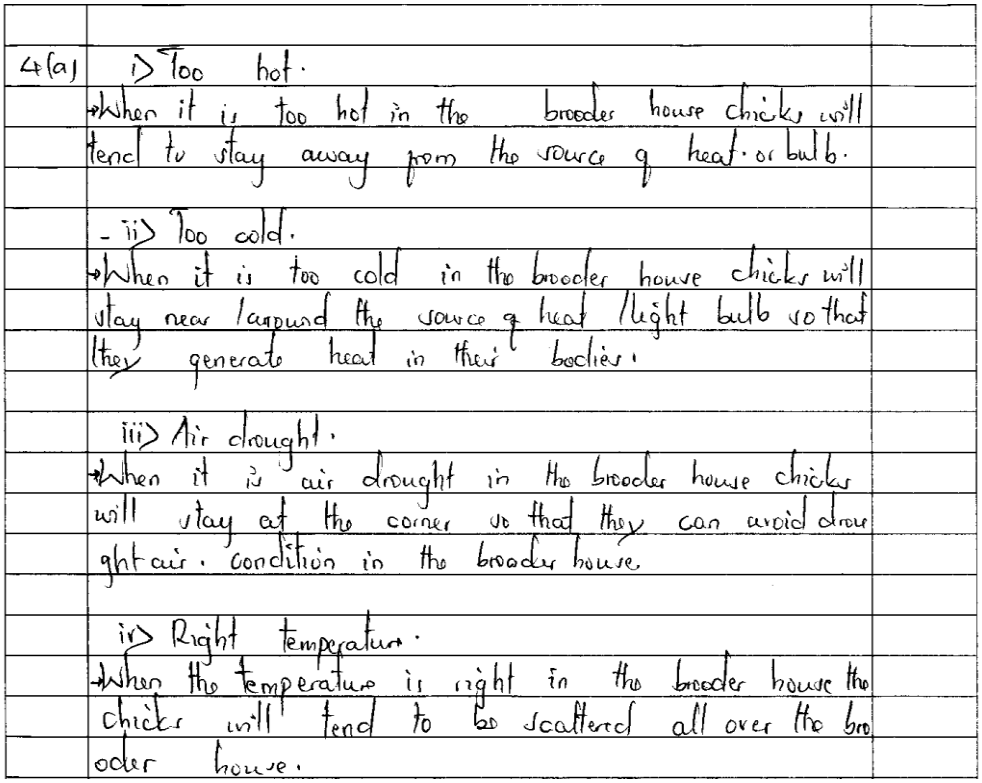
Figure 1.4 indicates that; the majority of the candidates (72.7%) scored from 3 to 10 marks and 27.3 percent scored from 0 to 2.5 marks.

The data analysis showed that; 33.9 percent of the candidates who attempted the question had a good performance. This signifies that the candidates provided correct responses to almost all parts of the question. In part (a), the candidates correctly explained the behaviour which will be shown by the chicks in the brooder house under the given conditions. The correct responses provided include: too hot – chicks stay away from the source of heat, too cold – chicks tends to crowd together at the centre, air draught – chicks tend to crowd in one corner and right temperature – chicks distribute

evenly throughout the floor of the brooder. Apart from explaining the behaviour of the chicks; few of the candidates illustrated the behavior in drawings.

Furthermore, the candidates correctly explained the advantages of keeping poultry using free range system in part (b). The candidates provided responses like; feeding cost is minimized, low initial costs, the birds eat a variety of things and manure is spread all over the field. These candidates' responses signify possession of adequate knowledge of the practice.

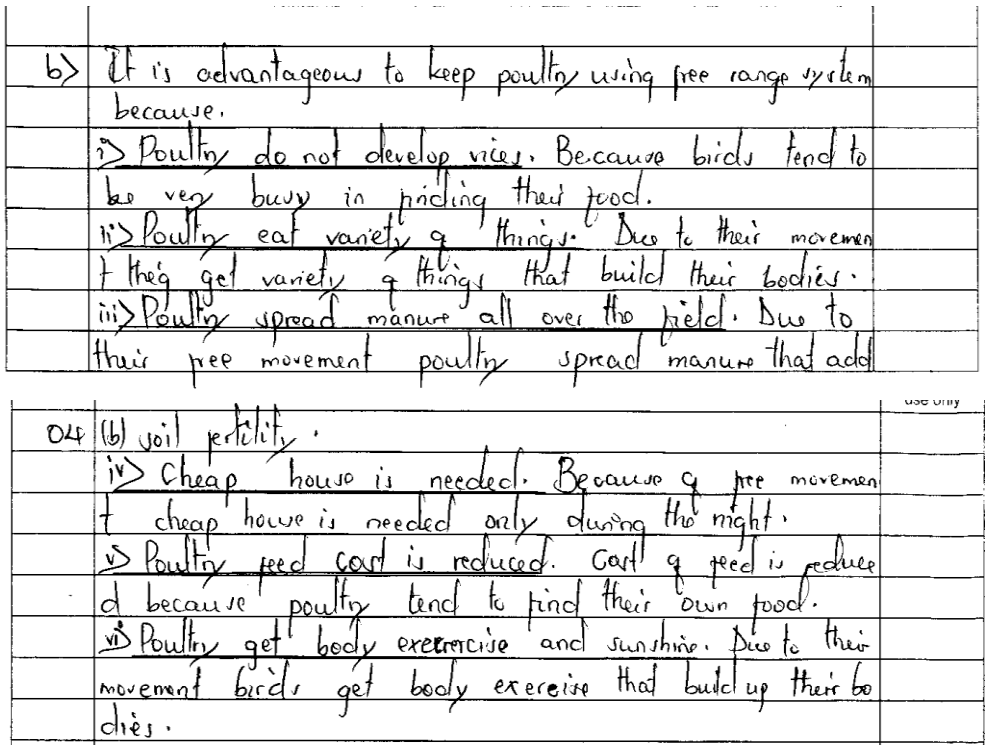
On the other hand, the candidates who had average performance (38.8%) in the question were able to explain the behaviour of the chicks which will be shown under different conditions in the brooder house. However, most of them faced difficulties in responding to the behavior to be shown by the chicks during air draught. In part (b), the candidates provided a few correct responses on the advantages of keeping poultry using a free-range system. Extract 1.2.1 illustrate candidates' good responses in the question.


4(a) i) Too hot.
*When it is too hot in the brooder house chicks will tend to stay away from the source of heat or bulb.

ii) Too cold.
*When it is too cold in the brooder house chicks will stay near /around the source of heat /light bulb so that they generate heat in their bodies.

iii) Air draught.
*When it is air draught in the brooder house chicks will stay at the corner so that they can avoid draught air condition in the brooder house.

iv) Right temperature.
*When the temperature is right in the brooder house the chicks will tend to be scattered all over the brooder house.



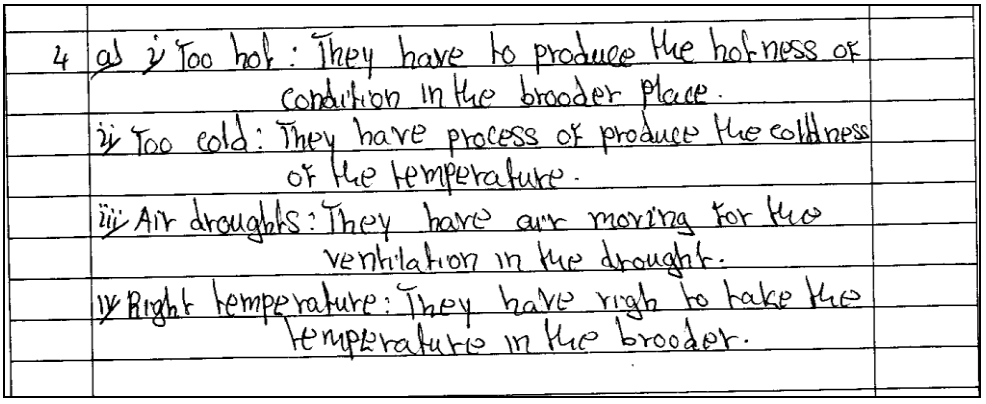

Extract 1.2.1: *A sample of good responses in question 4*

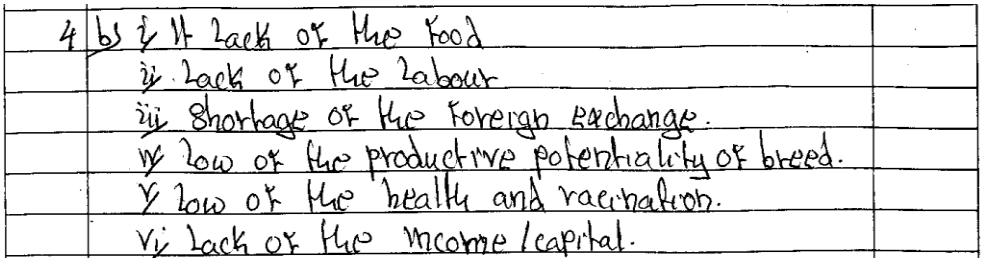
Extract 1.2.1 presents responses from a candidate who provided correct responses in all parts of the question. The candidate explained the chicks' behavior under different conditions in the brooder house correctly in part (a). Similarly, in part (b), he/she gave the advantages of keeping poultry using a free range system clearly.

On the contrary, 27.3 percent of the candidates had a weak performance in the question. Such candidates provided incorrect responses in almost all parts of the question. In part (a), they failed to explain the chicks' behaviour under different conditions in the brooder house. These candidates had a variety of responses that did not focus on the question asked. Examples of the incorrect responses provided by some of the candidates were: (i) Too hot - *chicks will die, Chicks will have more thirst, chicks will open their mouth,* and *the chicks will maintain their body weight* (ii) Too cold - *chick will shiver for higher coldness, chicks are normal walking around in the brooder, the chick can be affected with diseases* and *chicks will die* (iii) Air draughts - *the chick cannot maintain the body shape, they are gathering at one place near the source of light, chicks*

*refuse food, chicks use more medicine* and *no profit is taken from poultry* (iv) Right temperature - *they are coming together to avoid feather pecking, chicks will able to maintain its body health , make chick to survive in correct proportional* and *chicks will grow well*. These responses justify that, the candidates did not know the behavior shown by the chicks under different conditions in the brooder house. Failure to understand the behavior of the chicks might have been contributed by lack of field practice and experience of keeping poultry in real life situation. Both of these practices could have exposed the candidates to make observations regarding the behavior of the chicks under different conditions.

In part (b), the candidates could not give the advantages of keeping poultry using a free range system. Some of the incorrect responses provided were: *it increase production, it is the source of income, used as source of food, it is raw material of industries, it help animal to be safe, gives more meat, it is used in agriculture, it cause development in countries, help chicken to grow big and cause diseases*. This suggests that, the candidates lacked an understanding of the free-range system in rearing poultry. Extract 1.2.2 is one of the candidates' poor responses in the question.


4 a) i) Too hot: They have to produce the hotness of condution in the brooder place.
ii) Too cold: They have process of produce the coldness of the temperature.
iii) Air droughts: They have air moving for the ventilation in the drought.
iv) Right temperature: They have righ to take the temperature in the brooder.


4 b) i) It lack of the food
ii) Lack of the labour
iii) Shortage of the foreign exchange.
iv) Low of the productive potentiality of breed.
v) Low of the health and vaccination.
vi) Lack of the income/capital.

**Extract 1.2.2:** *A sample of poor responses in question 4.*

In part (a) of Extract 1.2.2, the candidate tried to give the meaning of the conditions given, rather than explaining the behavior under the conditions. In part (b), he/she gave responses that were unrelated to the requirements of the question.

### 2.2.3 Question 5: Environmental Degradation

The question had part (a) and (b), carrying a total of 10 marks. The candidates were required to: (a) describe five ways on how agricultural wastes and human activities contribute to water pollution and (b) describe measures that should be taken to overcome the problem described in part (a). The question examined the candidates understanding of the causes and control of water pollution.

The question was attempted by 6,834 (99.2%) candidates, of which 990 (14.5%) scored from 0 to 2.5 marks, 2,335 (34.2%) scored from 3 to 6 marks and 3,509 (51.3%) scored from 6.5 to 10 marks. Figure 1.5 presents the candidates' scores in the question.

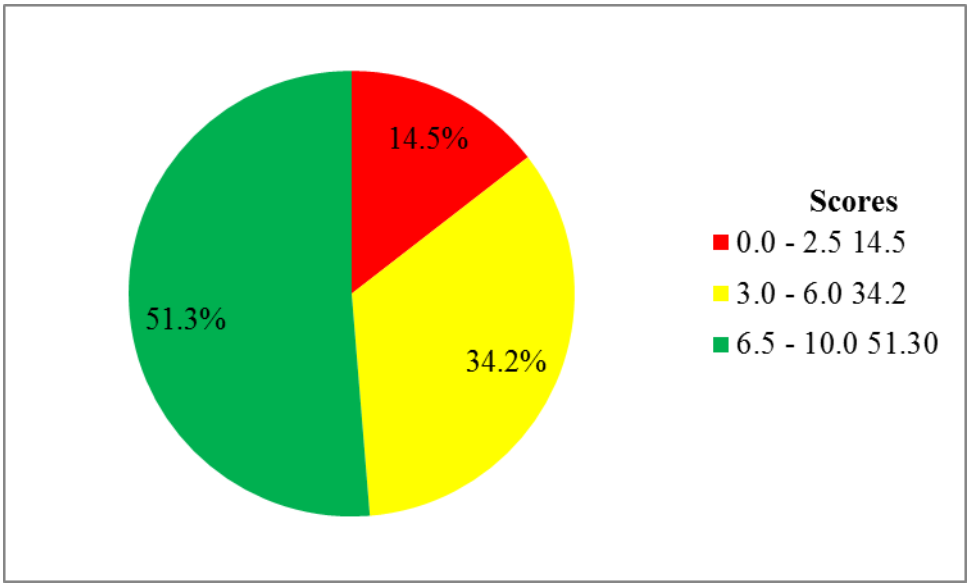


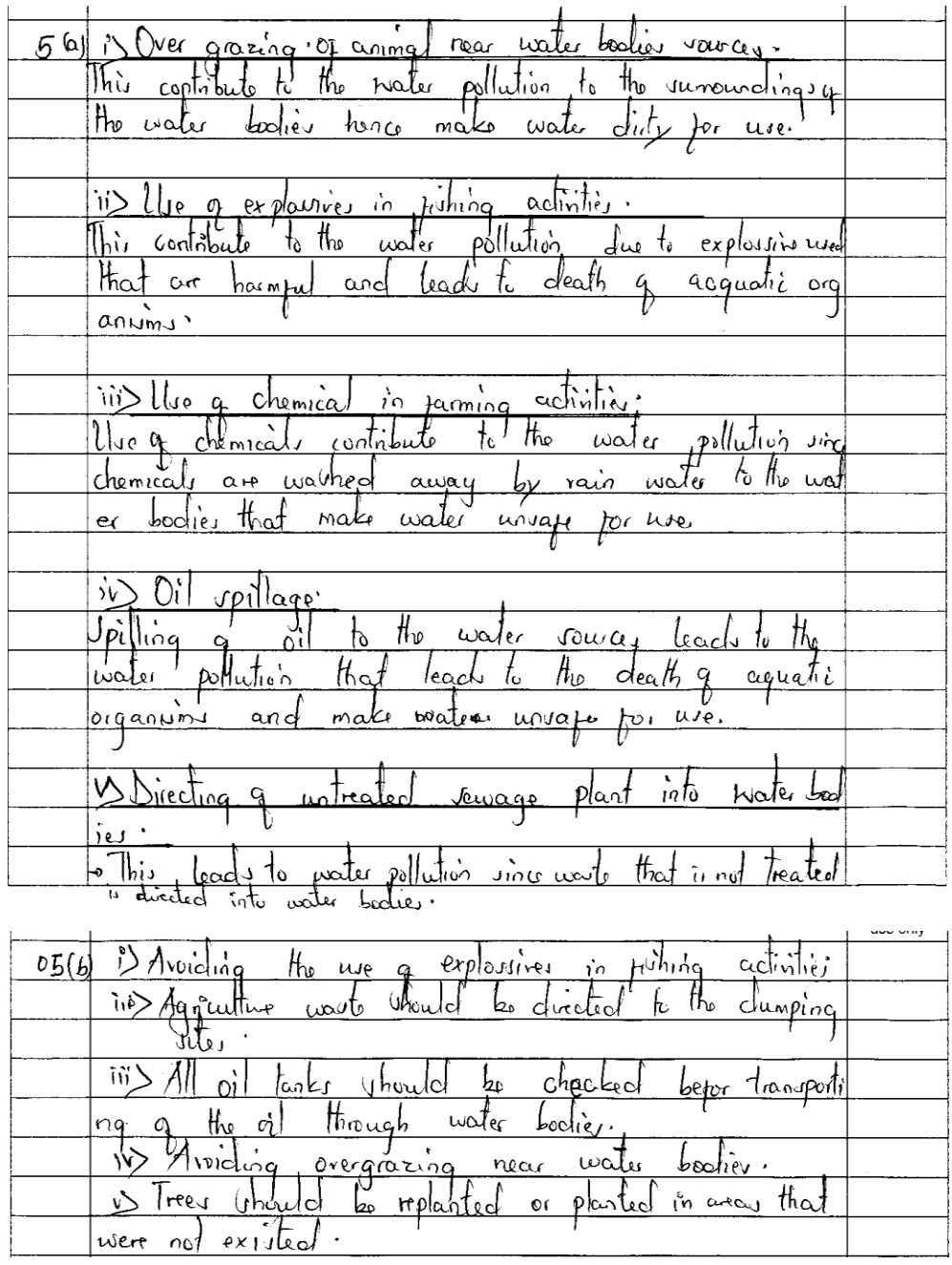

**Figure 1.5:** *The distribution of candidates' scores in question 5.*

Figure 1.5 shows that, most of the candidates (85.5%) scored from 3 to 10 marks whereby 14.5 percent scored from 0 to 2.5 marks.

The statistics shows that; about half (51.3%) of the candidates had good performance in the question. These candidates were able to describe five ways on how agricultural wastes and human activities contribute to water pollution in part (a). Some of the ways they presented are; *improper disposal of agricultural wastes such as herbicides, pesticides and fertilizers, human activities like land cultivation, bad fishing practices, uncontrolled burning and drainage of the sewage systems*.

In part (b), the candidates correctly explained measures that need to be taken to overcome the problem of water pollution. The measures provided included practicing organic farming, planting trees on river banks, conserving of water catchment areas, and enacting strict laws against activities resulting in water pollution. This shows that; the candidates were knowledgeable about the causes and control measures of water pollution.

The analysis further revealed that; 34.2 percent of the candidates performed averagely in this question. The majority of these candidates gave partially correct descriptions of how agricultural wastes and human activities contribute to water pollution in part (a). Consequently, they provided partially correct responses in part (b) on measures to be taken to overcome the problem of water pollution. Extract 1.3.1 is a sample of good responses in the question.

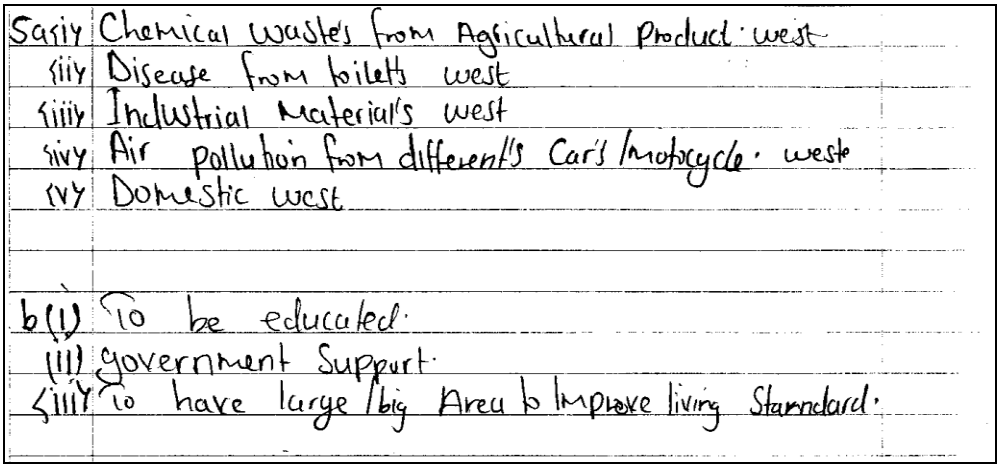



**Extract 1.3.1:** *A sample of good responses in question 5.*

Extract 1.3.1 is a sample of good responses from one of the candidates who performed well in all parts of the question. This shows that; the candidate had adequate knowledge of the causes and control of water pollution.

Further, the analysis indicated that; 14.5 percent of the candidates had low marks in the question. The majority of these candidates failed in almost all parts of the question. In part (a), they failed to describe how agricultural wastes and human activities contribute to water pollution. The majority of them provided responses that were not related to the concept of water pollution such as; *increase fertility*, *reduce erosion* and *control air pollution*. Some of the candidates outlined the effects of water pollution rather than explaining how agricultural wastes and human activities contribute to water pollution. Responses such as; *spread of water borne disease, death of living organisms like fish, transmission of communicable disease due to water pollution and destruction of source of water due to increased mud* were provided by some of the candidates. These candidates did not understand the types of agricultural wastes and human activities that can cause water pollution.

Moreover, in part (b), the candidates could not explain how to control agricultural wastes and human activities from causing water pollution. The incorrect responses were such as: *burn bushes, addition of organic matter, use fertilizers, control weeds, keep more livestock, conducting mixed farming and crop rotation* were provided by some of the candidates. Failure to identify the agricultural wastes and human activities that may cause water pollution was the reason for their inability to state control measures for water pollution. Extract 1.3.2 is a representative sample of poor responses to the question.




**Extract 1.3.2:** *A sample of poor responses in question 5.*

Extract 1.3.2 is a sample of poor responses from one of the candidates in the question. The candidate provided incorrect responses in all parts of the question. In part (a), he/she named some pollutants rather than explaining how agricultural wastes and human activities cause water pollution. In part (b), he/she failed to explain how education and government support can contribute to controlling water pollution.

### 2.2.4 Question 6: Agricultural Marketing

The question comprised two parts: (a) and (b), carrying a total of 10 marks. The candidates were required to: (a) (i) justify the statement that "no one country is self-sufficient in producing all that it needs", (ii) give three reasons as to why the trade across the borders of a country is important and (b) propose four measures that a country can take to correct the deficit in the balance of payment. The question tested the candidates' knowledge of international trade.

The question was attempted by 6552 (95.1%) candidates, whereby 5,658 (86.4%) scored from 0 to 2.5 marks, 847 (12.9%) scored from 3 to 6 marks, and 47 (0.7%) scored from 6.5 to 9.5 marks. No candidate scored all 10 marks. The general candidates' performance in the question was weak. Figure 1.6 illustrates the distribution of the candidates' scores in the question.

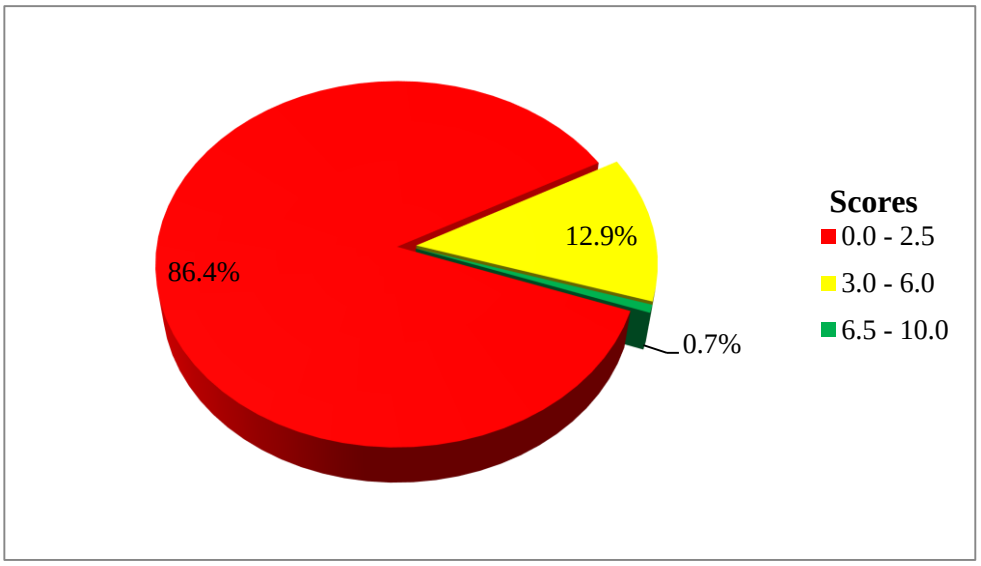



**Figure 1.6:** *The distribution of candidates' scores in question 6.*

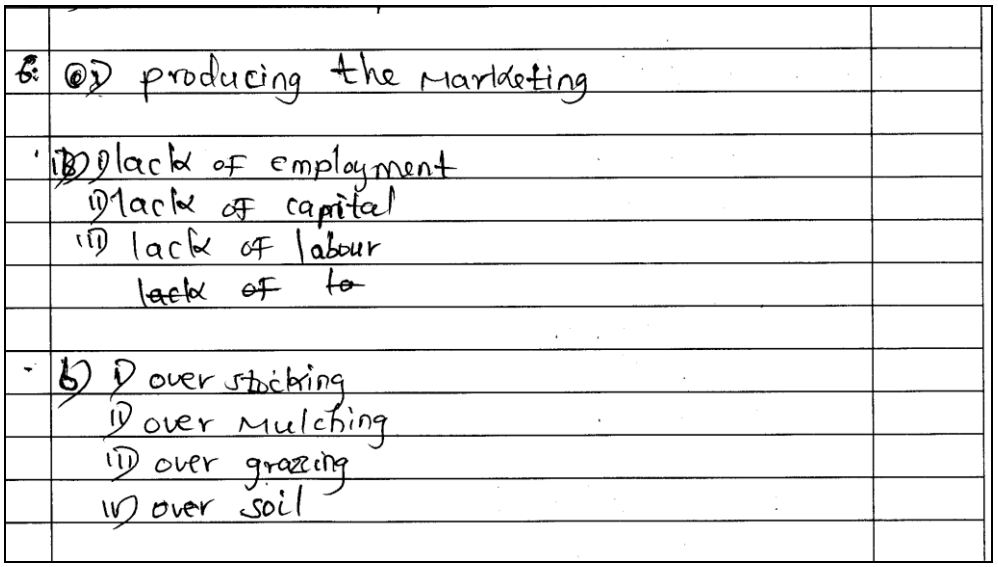
Figure 1.6 indicates that; the majority of the candidates (86.4%) scored from 0 to 2.5 marks while a few (13.6%) scored from 3 to 9.5 marks.

The analysis of the responses shows that; most of the candidates who had a weak performance failed in almost all parts of the question. In part (a) (i), they failed to justify the statement that; "no country is self-sufficient in producing all that it needs". They were supposed to know that; each country is specialized in the production of a commodity in which it possesses an advantage. Each country has the potential of producing certain goods depending on the resources, climatic conditions and skills, as explained in the law of comparative advantage. Therefore, no country can produce all commodities that it needs. However, the candidates provided various incorrect responses which were not specific to the requirement of the question such as; *there is risk, there is uncertainty, make easy available trade, country produce goods and services, the country takes crops abroad and poor infrastructure*. Such responses indicate that, the candidates were not conversant with the law of comparative advantages.

Similarly, in part (a) (ii), the candidates were not able to give reasons on why trade across the borders of a country is important. The majority of the candidates provided the importance of trade in general rather than the reasons for the trade across borders. Some of the incorrect responses given were; *in order to improve development of the different sectors, to provide employment to the people, source of raw materials, increase wages, help to visit another country and reduce risk, to prevent war of the countries, to sell goods and service, improve tourisms and avoid disease in the country.* These candidates did not understand that, trade across borders is international trade as a result they provided the importance of trade in general. This implies that, either the candidates were not knowledgeable on the importance of international trade or misunderstood the requirements of the question.

Moreover, in part (b), the candidates failed to propose measures that need to be taken to correct the deficit in the balance of payments. Examples of incorrect responses given include; *starting business, people must pay tax, grow crops in big farms to get more money, sell goods across the border, create employment and provide education to people.* The candidates appear to had not understood the meaning of the term balance of payment as it is the

difference between the value of imports and exports. Therefore, when there is a deficit in the balance of payments, it means that export is greater than imports. Extract 1.4.1 represents poor responses from one of the candidates.



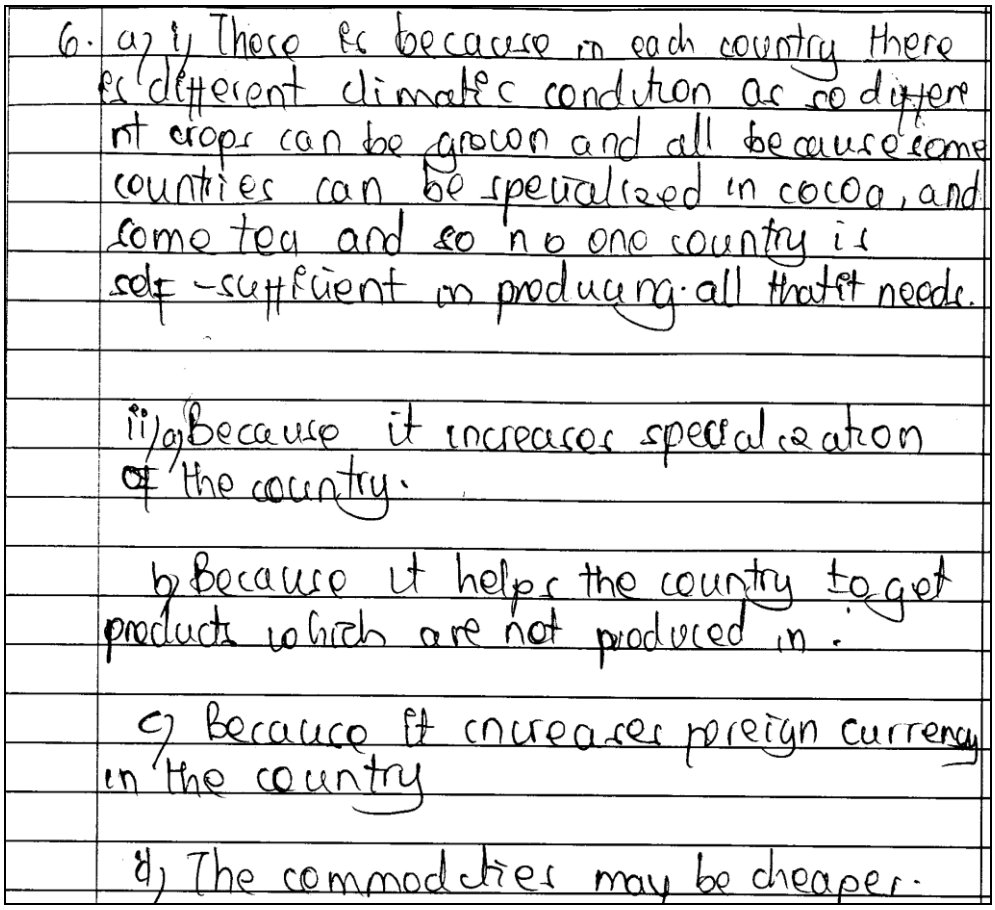

**Extract 1.4.1:** *A sample of poor responses in question 6.*

Extract 1.4.1 is a sample of poor responses from one of the candidates. The candidate did not understand the requirements of the question; thus, he/she provided responses that were not related to the questions asked.

However, 0.7 percent of the candidates had a good performance in this question. The candidates provided correct responses in almost all parts of the question. In part (a), they made the justification of the statement that; "no one country is self-sufficient in producing all that it needs" clearly; by explaining the concept of comparative advantages that; each country is specialized in the production of commodities in which it possesses an advantage. These candidates had a good mastery of the concept of comparative advantages.

In part (a) (ii), the candidates correctly outlined the importance of international trade such as; *enables specialization as countries produce goods for which they can produce most efficiently*, *countries export goods which they produce most effieciently and earn foreign exchange* and *countries import goods which they do not produce due having less advantages*. This indicates that the candidates had adequate knowledge of the importance of international trade.

Moreover, in part (b), the candidates proposed the correct measures that need to be taken to correct a deficit in the balance of payments, such as; *asking foreign countries to pay back loan, withdrawing from foreign reserves, selling foreign investment and borrowing from foreign countries*. Therefore, the candidates were knowlegeable about the concept of the balance of payment. Extract 1.4.2 illustrates good responses in the question.

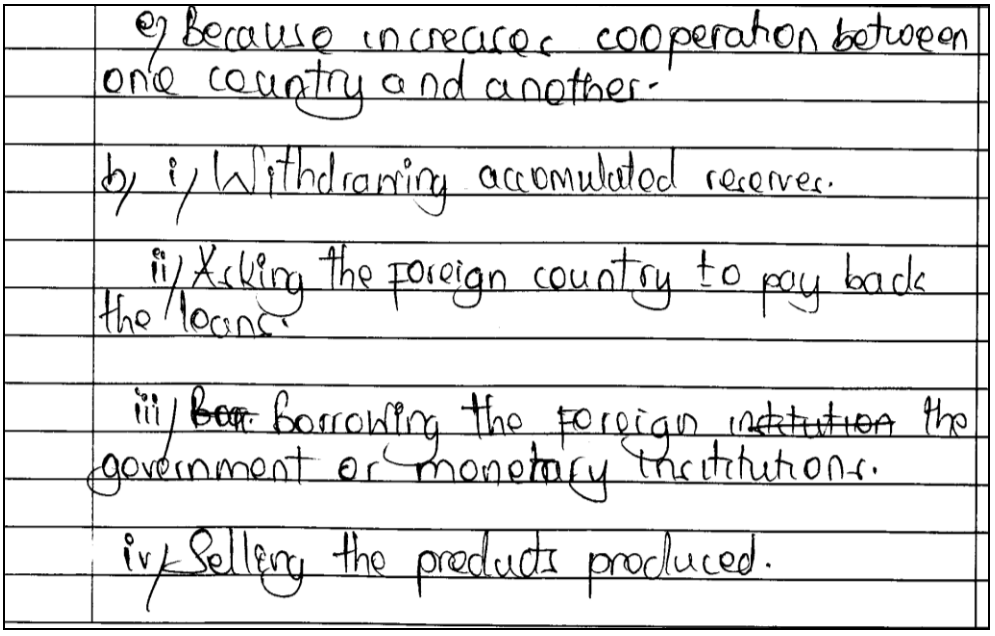

6. a) i) There is because in each country there is different climatic condition as so different crops can be grown and all because some countries can be specialized in cocoa, and some tea and so no one country is self-sufficient in producing all that it needs.

ii) a) Because it increases specialization of the country.

b) Because it helps the country to get products which are not produced in.

c) Because it increases foreign currency in the country

d) The commodities may be cheaper.




**Extract 1.4.2***: A sample of good responses in question 6.*

Extract 1.4.2 is a sample of the candidates' good responses in the question. The candidate provided correct responses in almost all parts of the question except in one point in part (b) (*selling the products produced*).

### 2.2.5 Question 7: Soil and Water Conservation

The question had two parts; (a) and (b), carrying a total of 10 marks. The candidates were required to: (a) account for any three agents of erosion and (b) briefly explain seven types of terraces that can be constructed on sloping areas for erosion control. The question examined the candidates' competence in the concept of soil erosion and its control measures.

The question was attempted by 6,804 (98.8%) candidates, out of which 5,787 (85.1%) scored from 0 to 2.5 marks, 934 (13.7%) scored from 3 to 6 marks, and 83 (1.2%) scored from 6.5 to 10 marks. The general performance of the candidates in this question was weak. Figure 1.7 shows the distribution of the candidates' scores in the question.

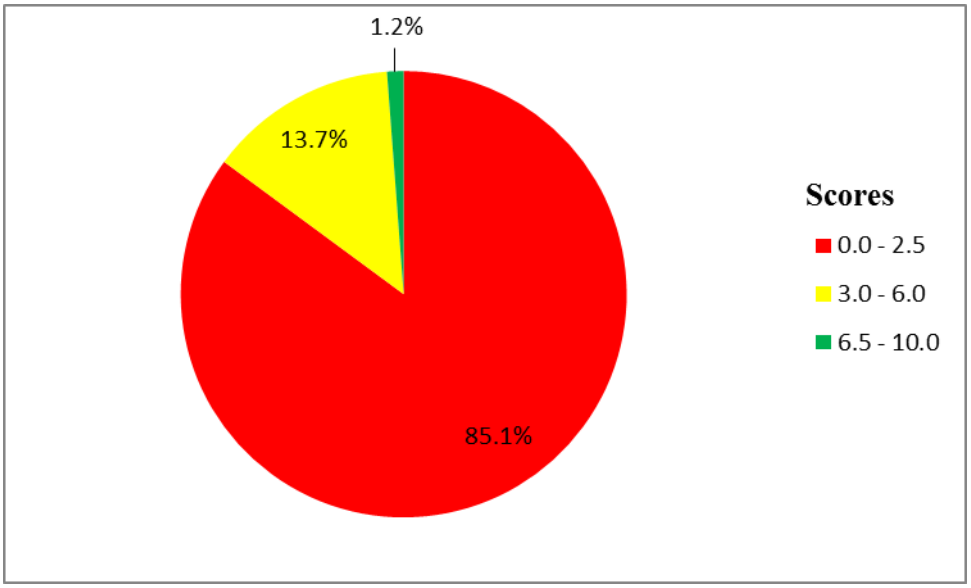



**Figure 1.7:** *The distribution of candidates' scores in question 7.*

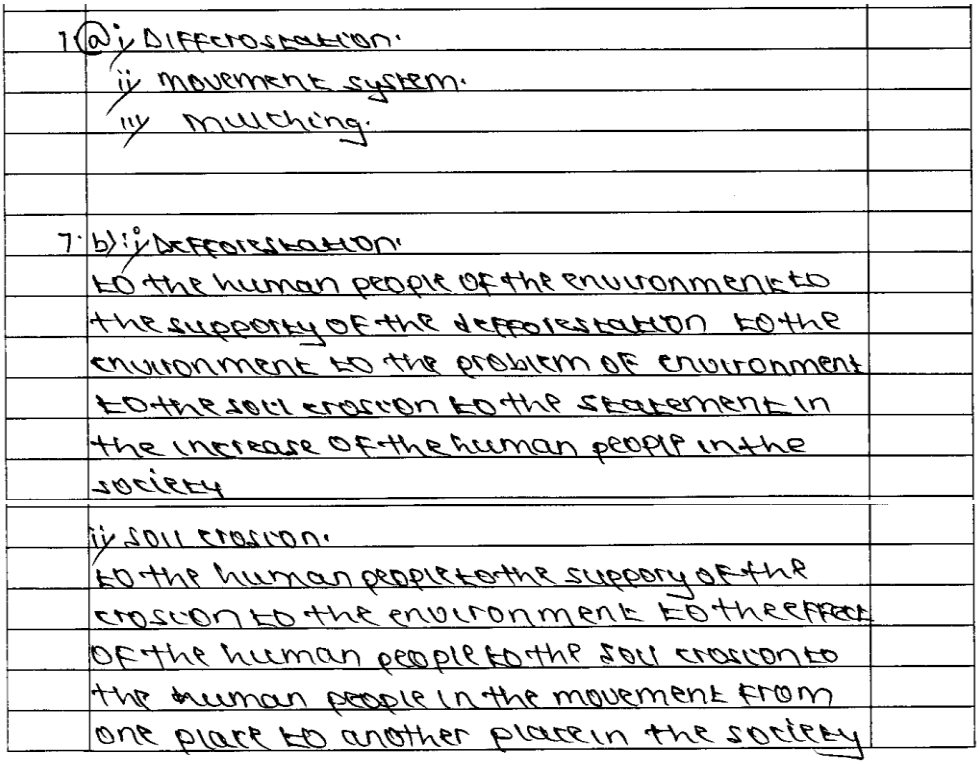
Figure 1.7 indicates that; the majority (85.1%) of the candidates scored from 0 to 2.5 marks, and a few (14.9%) scored from 3 to 10 marks.

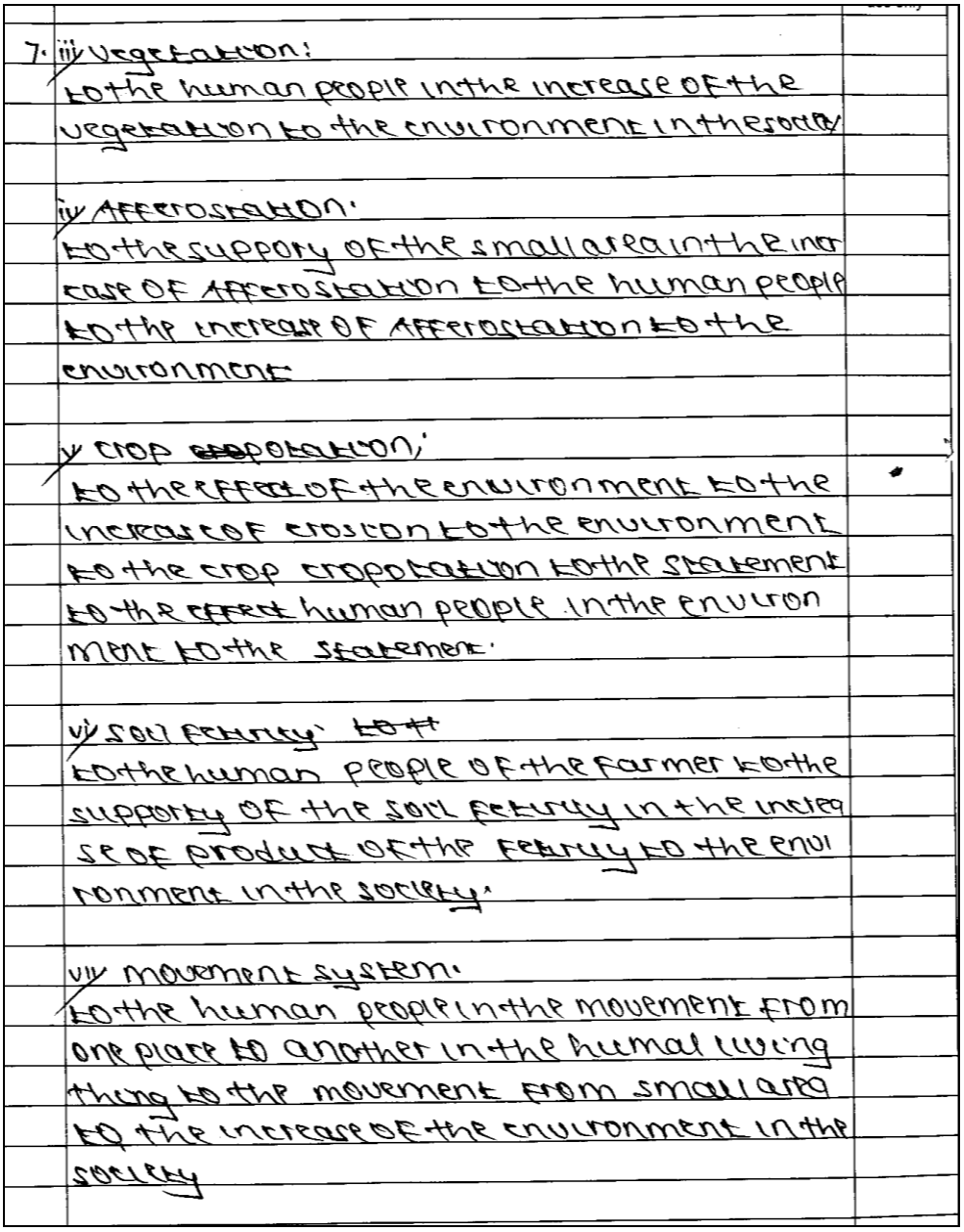
The analysis shows that, the candidates who performed poorly (85.1%) provided incorrect responses in both parts of the question.
In part (a), such candidates failed to account for the agents of erosion. Some of them provided incorrect responses such as; *air, temperature, light, humidity and climate* which were not associated with soil erosion. Other candidates outlined the causes of soil erosion instead of accounting for the agents of erosion. The responses such as *overgrazing, cutting trees, burning of vegetation and cultivating along hillsides* were given by some of the candidates. This signifies the candidates' poor understanding of the agents of soil erosion.

A few candidates named two common erosion agents: wind and water, leaving aside human, animals, and gravity. Such candidates did not understand that; the land is left bare and made prone to erosion through the trampling of animals and human activities. Likewise, gravity influences erosion: the slopier the area, the higher the rate of erosion.

In part (b), the candidates failed to explain the types of terraces that need to be constructed in sloping areas to control erosion. Most of the candidates

pointed out the general control measures for erosion, rather than focusing on the types of terraces used in sloping areas to control erosion. The candidate provided responses such as *mulching, planting trees avoid overgrazing, avoid burning of vegetation and contour farming* which are the general control measures for erosion. This suggests that; the candidates lacked knowledge of the types of terraces that need to be used in sloping areas to control erosion. Extract 1.5.1 is an example of poor responses in the question.






**Extract 1.5.1:** *A sample of poor responses in question 7.*

In Extract 1.5.1, the candidate provided incorrect responses in all parts of the question. In part (a), he/she mentioned two control measures of erosion instead of the agents of erosion. Moreover, in part (b), the candidates explained some causes and control measures of erosion instead of types of terraces used to control erosion.

Furthermore, 13.7 percent of the candidates performed averagely in the question. Most of these candidates correctly accounted for some of the agents of erosion in part (a). Similarly, in part (b), they explained the types of terraces that need to be constructed in sloping area to control erosion correctly. What denied them full marks was the failure to exhaust all the types of terraces as the question required.

On the other hand, 1.2 percent of the candidates had a good performance. Such candidates correctly responded in almost all parts of the question. In part (a), the candidates correctly accounted for the agents of soil erosion. The agents of soil erosion given were; water, wind, human, animals and gravity. Furthermore, they explained correctly the types of terraces which are to be used to control erosion in part (b). Types of terraces explained were; bench terraces, broad based terraces, narrow based terraces, graded terraces, *level terraces*, *fanya juu terraces* and *fanya chini terraces*. This justifies that; the candidates were conversant with the types of terraces used to control erosion. Extract 1.5.2 is a vivid example of good responses in the question.

07(a) Agents of soil erosion.

(i) Wind.

Wind action is very effective on bare land(a land with no vegetative cover) as soil particles are removed away from one place to another through moving air (wind).

(ii) Water.

Moving water moves soil particles from one place to another along the rivers or on a bare land when it rains.

(iii) Animals and human activities.

- Animals like elephants and other large animals cause soil particles to disintergrate which may facilitate soil erosion. Also small animals like burrowing animals such as rats and mites influence weathering which contributes in soil erosion.
- Also human activities like agriculture and mining influence soil erosion.

07(b) Types of terraces.

(i) Bench terraces.

- These are terraces which are made (constructed) on slopes of a 35% to 55% slopes where by the speed of run-off water is minimized and soil erosion is controlled.
- Under these slopes high value crops like coffee are planted.

07(b) (ii) Level terraces. Graded terraces.
- These are terraces which are constructed along the slopes in order to drain water from the farm at very low speed to areas where vegetables are grown.

(iii) Broad based terraces.
- These are terraces that are constructed along a 2% to 12% slope in order to control soil erosion and minimize the speed of run-off water.

(iv) Narrow based terraces.
- These are terraces which are made (constructed) along the slopes of 12% to 20% slope in order to minimize the speed of run-off water and control soil erosion. They may be constructed by using hands.

(v) Level terraces.
- These are terraces which are made (constructed) in order to retain water in the farm for a long period of time. Example from rainy season to a nearly dry season.

(vi) Fanya juu terraces.
These are terraces where by the heap of soil are heaped up hill to minimize the speed of water and to control soil erosion.

(vii) Fanya chini terraces.
These are terraces which are constructed along the slopes and the soil is heaped downward to control soil erosion and to minimize the speed of run-off water.

**Extract 1.5.2:** *A sample of good responses in question 7*

Extract 1.5.2 represents good responses in the question. The candidate provided correct responses to all parts of the question.

### 2.2.6 Question 8: Physical Properties of the Soil

The question had part (a), (b) and (c), carrying a total of 10 marks. The candidates were given the following scenario: A moist soil sample weighed 100 g. After oven-dry, the weight dropped to 90 g. Suppose the total volume of the soil sample is 80 $cm^3$ and the volume of pore space is 40 $cm^3$. The candidates were required to calculate: (a) bulk density of the soil, (b) particle density of the soil and (c) porosity of the soil. The question intended to test the candidates' understanding of the physical properties of the soil.

The question was attempted by 6,215 (90.2%) candidates whereas 3,594 (57.8%) scored from 0 to 2.5 marks, 2,446 (39.4%) scored from 3 to 6 marks and 175 (2.8%) scored from 6.5 to 10 marks. The general performance of the candidates in the question was average. Figure 1.8 presents the candidates' scores in the question.

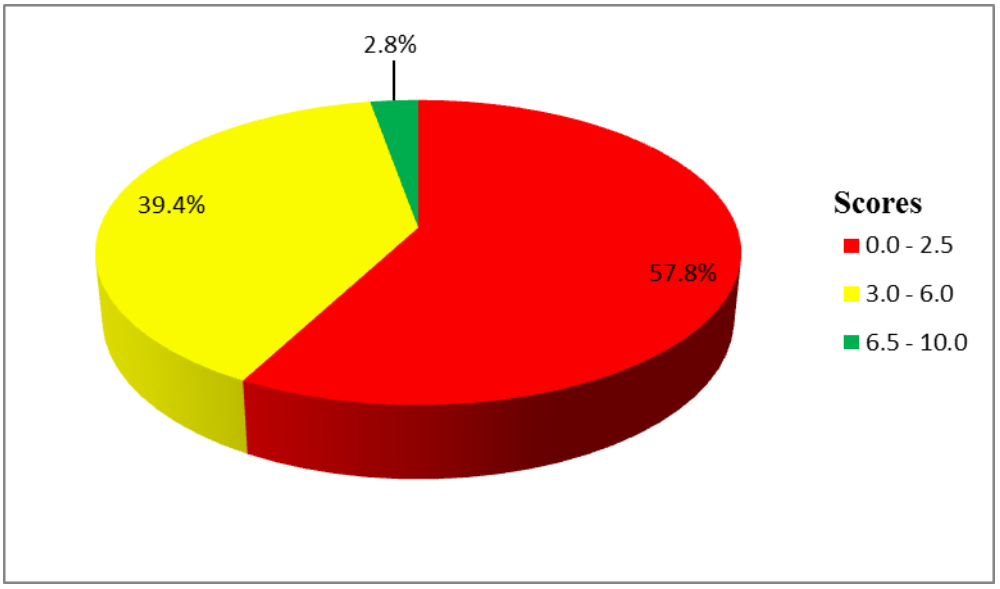



**Figure 1.8:** *The distributions of scores in question 8.*

Figure 1.8 indicates that; the majority of the candidates (57.8%) scored from 0 to 2.5 marks, and 42.2 percent scored from 3 to 10 marks.

The data analysis shows that; 2.8 percent of the candidates who attempted the question had a good performance. Most of them calculated the bulk

density, particle density and porosity of the soil sample in part (a), (b), and (c) correctly.

In part (a), the candidate used the correct formula for calculating bulk density of the soil, which is: $\text{Bulk density} = \frac{\text{Weight of oven dried soil}}{\text{Total volume of the soil}}$.
The candidates plugged into the formula the correct data among the given ones; the weight of the oven-dried soil = 90 g and total volume of the soil = 80 $cm^3$ hence arrived at the correct value, which was 1.125 $g/cm^3$.

Similarly, in part (b), the candidates calculated precisely the particle density of the soil using the formula:
$\text{Particle density} = \frac{\text{Weight of oven dried soil}}{\text{Total volume of the soil - Volume of pore space}}$. The candidates used the weight of the oven-dried soil, which was 90 g, and a total volume of the soil – the volume of pore space which was 40 $cm^3$ to correctly calculate particle density of the soil, which was 2.25 $g/cm^3$.

In part (c), the candidates calculated the porosity of the soil correctly using the formula: $\text{Porosity} = 100 - \frac{\text{Bulk density} \times 100}{\text{Particle density}}$
The candidates plugged into the formula the values of bulk density and the value of particle density obtained in part (a) and (b) to arrive at the correct value of the porosity, which was 50%. Extract 1.6.1 is a sample of good responses in the question.

use only

8 a) ~~Partid~~

From

B.D = Weight of soil / volume of soil

B.D = 90 / 80

B.D = 1.125 g/cm³

∴ The bulk density is 1.125 g/cm³.

bulk

b. Particle density (P.D) = ?

P.D = Weight of soil solid / Volume of soil solid

P.D = 90 g / 40 cm³

P.D = 2.25 g/cm³.

∴ The particle density is 2.25 g/cm³.

c. Porosity = 100 − (Bulk D / P.D) x 100%

Porosity = 100 − (1.125 / 2.25) x 100

= 100 − (0.5 x 100)

= 100 − 50

= 50%

∴ The porosity of the soil is 50%.

**Extract 1.6.1:** *A sample of good responses in question 8*

Extract 1.6.1 is a sample of good responses from a candidate who did well in the question. The candidate used the correct formulae and data given to correctly calculate the bulk density, particle density and porosity of the soil in part (a), (b) and (c), respectively.

Conversely, the candidates who had a weak performance in the question composed 57.8 per cent of the candidates who sat for the examination. They

incorrectly calculated the bulk density, particle density, and porosity of the soil sample in part (a), (b) and (c), respectively. Most of them used inappropriate formulae to calculate the parameters. For example, in part (a) and (b), the candidates used the formula: $\frac{\text{Mass}}{\text{Volume}}$ to calculate bulk density and particle density of the soil. The candidates plugged into the formula different masses and volumes of soil given. For example, bulk density=100/80 and particle density=100/40. These calculations led to incorrect values of bulk density and particle density.

In part (c), most of the candidates used the formula $\frac{\text{Bulk density}}{\text{Particle density}}$ to calculate porosity of the soil, which was inappropriate; hence they arrived at the incorrect value of porosity. This signifies that; the candidates lacked an understanding of bulk density, particle density, and soil porosity. Extract 1.6.2 is a sample of poor responses in the question.

08. a/ The Bulk density of the soil.

B.D = Weight of the soil sample − Weight of the dry sample.

B.D = 100g − 90g

= 10g

∴ The Bulk density of the soil = 10g.

b/ The particle density of the soil.

$$P.D = \frac{B.D - 1}{\text{Weight of soil sample}} \times 100\%$$

$$P.D = \frac{10g - 1}{100g} \times 100\%$$

$$P.D = \frac{9}{100g} \times 100\%$$

$$P.D = \frac{900}{100}\%$$

P.D = 9%.

∴ The particle density of the soil is 9%.

c/ Porosity of the soil.

$$\text{Porosity} = \frac{B.D}{P.D} \times 100\%$$

$$\text{Porosity} = \frac{10}{9} \times 100\% = 1.12\%$$

∴ Porosity of the soil is 1.12%

**Extract 1.6.2:** *A sample of poor responses in question 8.*

In Extract 1.6.2, the candidate used incorrect formulae and data to calculate bulk density, particle density and porosity of the soil in part (a), (b) and (c), respectively.

### 2.2.7 Question 9: Annual Field Crops Production

The question comprised part (a) and (b), carrying a total of 10 marks. The candidates were given the following scenario: A farmer grew Irish potato on his farm. A few weeks later, he noticed that the plants were not performing well, hence invited an extension officer for advice. During the visit, the extension officer observed the following symptoms:

- wilting of the vegetative parts;
- tuber of the infected plants producing white juice when cut and squeezed.

The candidates were required to: (a) (i) identify the disease affecting the crop, (ii) briefly explain ways in which the disease spreads in the field and (b) educate farmers on the possible ways of controlling the identified disease. The question intended to examine the candidates' knowledge of plant diseases and their control.

The question was attempted by 6,236 (90.5%) candidates, out of which 4,965 (79.6%) candidates scored from 0 to 2.5 marks, 1,147 (18.4%) scored from 3 to 6 marks and 124 (2.0%) scored from 6.5 to 10 marks. Thus, the performance of the candidates in the question was weak. Figure 1.9 indicates the candidates' scores in the question.

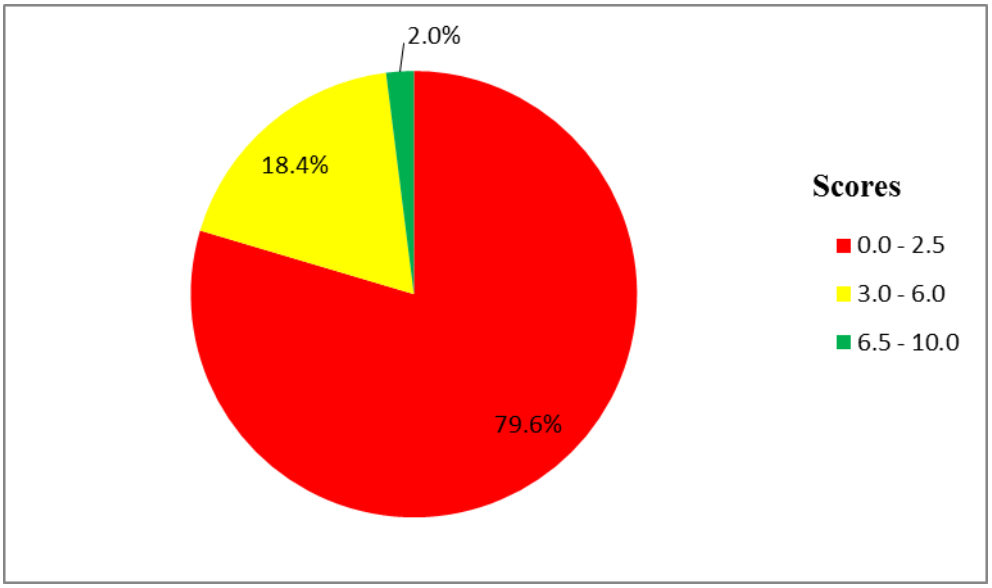


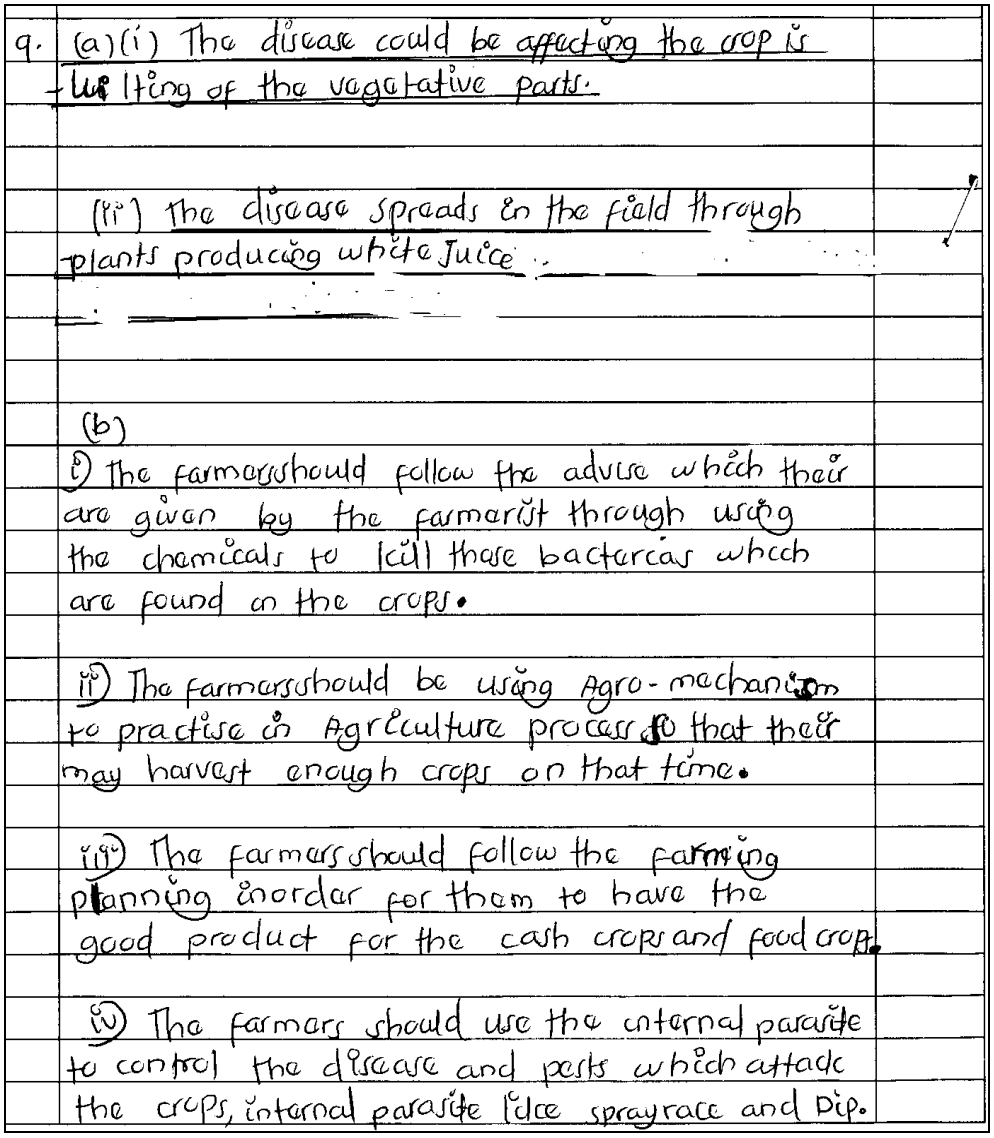

**Figure 1.9:** *The distribution of scores in question 9.*

Figure 1.9 shows that, most of the candidates (79.6%) scored from 0 to 2.5 marks, whereas 20.4 percent scored from 3 to 10 marks.

Most of the candidates (79.6%) with a weak performance failed to identify the disease in part (a) (i). Some of them named the causative agents of diseases such as *bacteria, fungi, virus, nematodes* and *protozoa* instead of identifying the name of the disease affecting the crop, which was bacterial wilt. Similarly, in part (a) (ii), the candidates failed to explain the ways in which the disease spreads in the field. The candidates provided responses such as; *through air, by contact, spread by insects, by moving animals, by people walking in the farm* and *bad farming practices* of which are all wrong. The correct responses were: spreads by the infected seed tubers and furrow irrigation.

Failure of the candidates to respond in part (a) correctly made them fail to give possible ways of controlling the diseases in part (b). Most of them named different categories of control measures such as *chemical methods, Biological methods, mechanical methods, legislative methods* and *cultural method*s, instead of explaining the specific control measures for the disease in question. Examples of the control measures for the disease were *crop rotation, use certified potato seeds*, *uprooting affected plant* and *use of resistant varieties.*

The responses provided by the candidates exhibit their poor understanding of bacterial wilt disease in potato and how to control it. Poor understanding of the disease is attributed to the lack of exposure to field practice where the candidates could have participated and learn the production of the crop, including controlling diseases. Extract 1.7.1 is a sample of poor responses from a candidate who had a weak performance in the question.


9. (a)(i) The disease could be affecting the crop is wilting of the vegetative parts.

(ii) The disease spreads in the field through plants producing white juice.

(b)
i) The farmersshould follow the advise which their are given by the farmarist through using the chemicals to kill those bactercas which are found on the crops.

ii) The farmersshould be using Agro-mechanism to practise in Agriculture processso that their may harvest enough crops on that time.

iii) The farmers should follow the farming planning inorder for them to have the good product for the cash crops and food crop.

iv) The farmers should use the internal parasite to control the disease and pests which attack the crops, internal parasite like sprayrace and Dip.

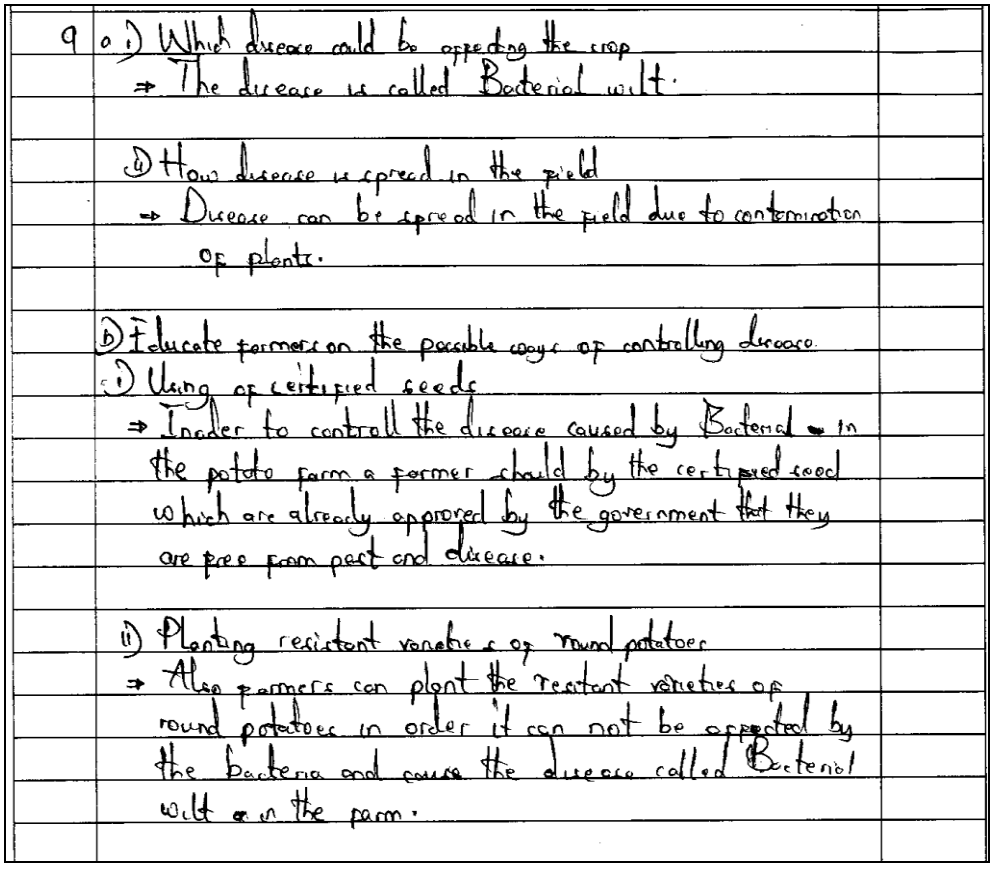
**Extract 1.7.1:** *A sample of poor responses in question 9.*

Extract 1.7.1 exemplifies responses from a candidate who failed in all parts of the question. For example, in part (a) (i) and (a) (ii) the candidate repeated the symptoms of the disease stated. In part (b), he/she provided responses that were not related to the requirements of the question.

On the other hand, the candidates who had a good performance were 2.0 percent. Most of them scored high marks in almost all parts of the question.

In part (a) (i), they correctly identified the disease as bacterial wilt. Likewise, in part (a) (ii), the candidates correctly explained how disease spreads in the field. The candidates provided responses such as; spread through infected seed tubers and farrow irrigation.

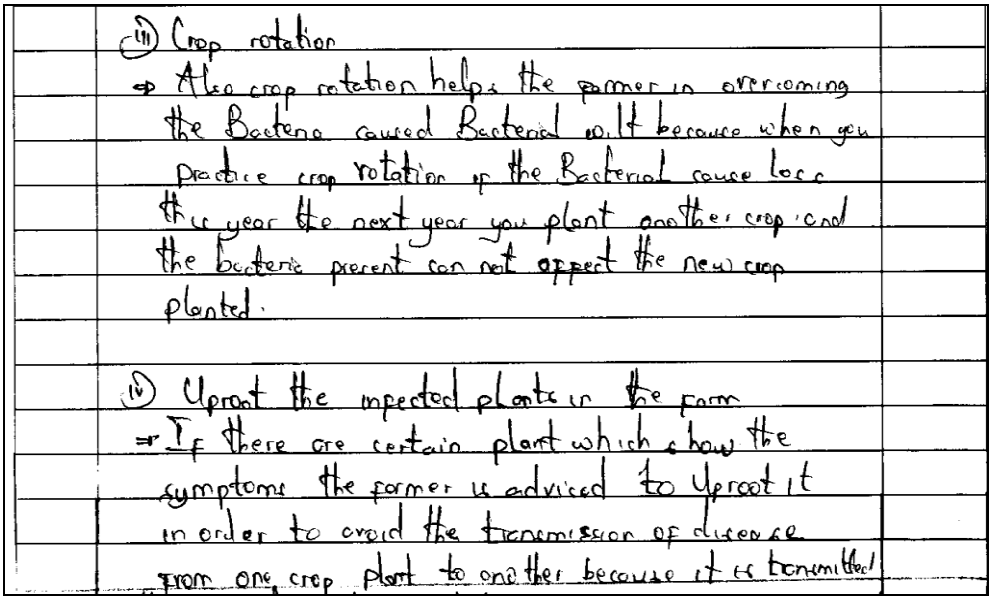
In part (b), the candidates provided correct ways in which the disease can be controlled, such as; proper field sanitation, an appropriate irrigation system especially overhead, crop rotation, planting resistant variety, and proper spacing. Extract 1.7.2 depicts good responses in the question.


9 a) i) Which disease could be affecting the crop
⇒ The disease is called Bacterial wilt.

ii) How disease is spread in the field
⇒ Disease can be spread in the field due to contamination of plants.

b) Educate farmers on the possible ways of controlling disease
i) Using of certified seeds
⇒ In order to controll the disease caused by Bacteria in the potato farm a farmer should by the certified seed which are already approved by the government that they are free from pest and disease.

ii) Planting resistant varieties of round potatoes
⇒ Also farmers can plant the resistant varieties of round potatoes in order it can not be affected by the bacteria and cause the disease called Bacterial wilt on the farm.




**Extract 1.7.2:** *A sample of good responses in question 9.*

In Extract 1.7.2, the candidate correctly attempted both parts of the question.

## 2.3 SECTION C: ESSAY QUESTIONS

### 2.3.1 Question 10: Agricultural Prices

This question carried a total of 15 marks. The candidates were required to explain three causes of price changes and advice five ways of protecting agricultural products from such changes. The question tested the candidates' understanding of the causes and control of price changes in agriculture.

The question was opted by 3,184 (46.2%) candidates, whereby 2,122 (66.6%) candidates scored from 0 to 4 marks, 734 (23.1%) scored from 4.5 to 9.5 marks and 328 (10.3%) scored from 10 to 15 marks. This signifies that; the performance of the candidates in the question was average. Figure 1.10 shows the candidates' scores in the question.

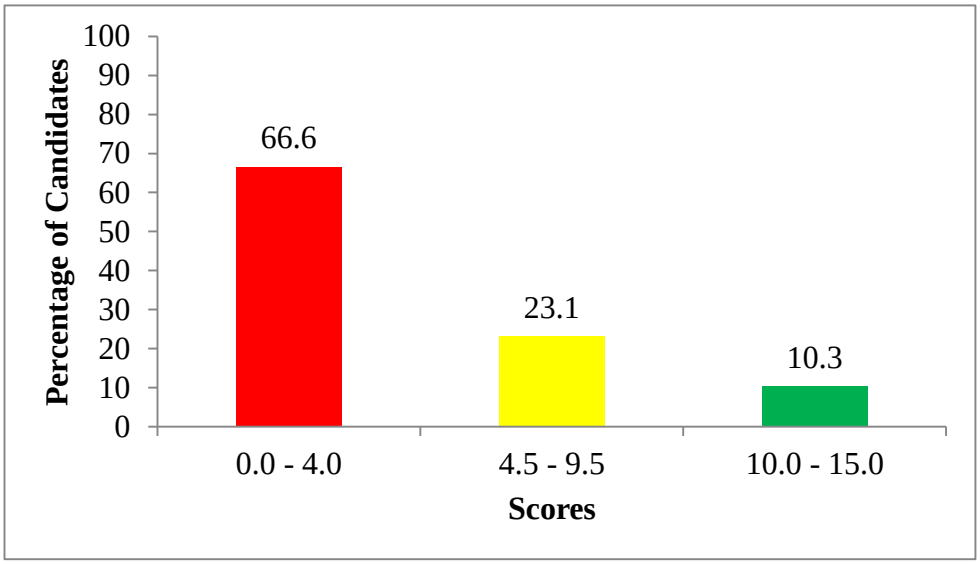



**Figure 1.10:** *The distribution of scores in question 10.*

Figure 1.10 summarizes the scores, whereby; 33.4 per cent of the candidates scored from 4.5 to 15 marks while the majority (66.6%) scored from 0 to 4 marks.

The analysis revealed that, the candidates who scored high marks (10.3%) organized their essays into the key essay parts namely introduction, main body and conclusion. The candidates introduced and concluded their essays correctly. In the main body, most of the candidates correctly explained the causes and control of price changes in agriculture. The candidates explained the causes such as; climatic conditions, time taken from planting to harvesting, the occurrence of disease and pests, perishability of the products and political instability. Furthermore, the candidates explained the control measures for price changes as the use of subsidies, use of international commodity agreement, the use of buffer stock fund, the control of area under cultivation and output and the use of price stabilization fund. This implies that; the candidates had adequate knowledge of the cause and control of price changes in agriculture. The candidates also demonstrated good essay writing skills.

However, the candidates who attained average performance (23.1%) in the question managed to explain few causes of price changes in agriculture

correctly but failed to fully explain the control measures for such change. Extract 1.8.1 is a sample of good responses from a candidate who had a good performance in the question.

10

Price fluctuation: Is the rise and fall of agricultural productuct in market over a period of time. The rise and fall of those prices can be occur seasonally, year to year or over a long period of time. The price of a commodity always depends on supply and demand of the commodity. The following are the causes of price changes:

The biological nature of agricultural product: Most of prices do rise in scarcity especially during planting period and the prices becomes low during harvesting time by this nature the price changes is inevitable. Example the time for incubation and layering period.

Most of agricultural inputs are fixed in nature: This cause the supply of the product to decrease and through this the price rises due to increase in demand so, the fixed inputs like Machinery contributes in the changes of the price in the market.

Most agricultural products can not be stored easily. The agricultural productuct like Perishable crops like Vegetables lack proper measure of storing them hence the price rises during scarcity and falls during their harvest by this cause the price to fluctuate.

The following are measures to be taken to protect the changes in agricultural prices.

The use of subsidies: The government should fix the prices of the commodity higher than the equilibrium price so that to overcome the changes in the price of farmers and by doing so helps the farmers to produce at a reasonable rate so as To avoid price fluctuation.

The use of international agreements. The countries which are participating in growing one commodity should be able to fix the reasonable price in international market so as to avoid the price changes which may cause fluctuation in price.

10 Example on crops like coffee, tea and cotton.

The use of buffer stock fund: The government should buy the product when there is high supply so as to add the extra demand to prevent the price change due to high supply of the commodity hence helps the farmers to avoid the price changes.

The use of stabilization fund: This is done by different Marketing boards which stabilize the ~~fun~~ price for a particular commodity Example the Tanzania cotton Board and The Tanzania coffee Board. They helps to reduce the abruptly rise and falling of prices by keeping the fixed price for particular product.

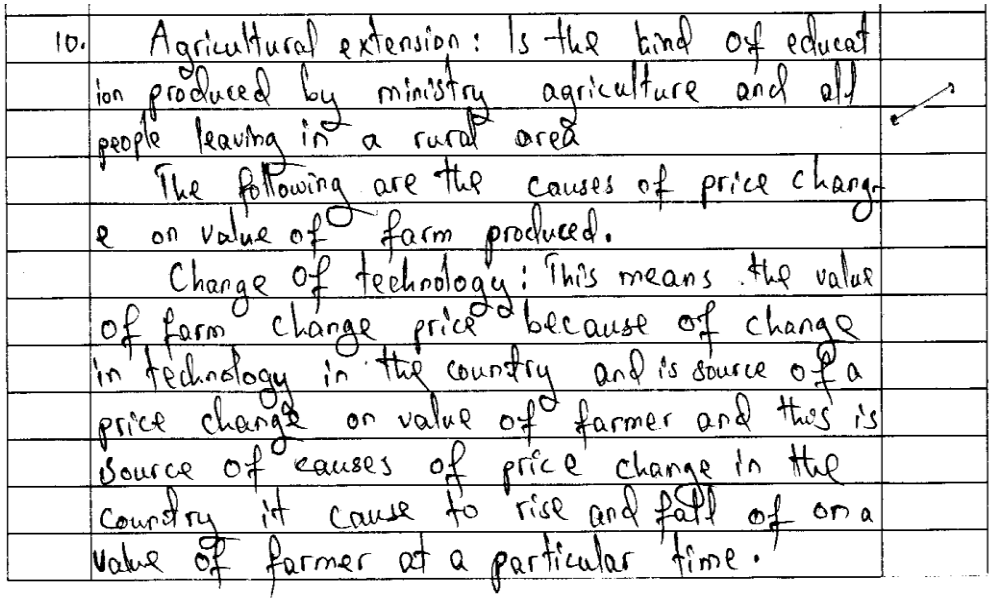
Through controlling the area under cultivation: The government should control the area to be cultivated so as to avoid high supply of the commodities so as to prevent the price changes in the country.

By stabilizing and controlling the price changes would help the government to fix the price at a reasonable rate to which producers would be able to have the profits on their products, also by preserving the crops it will act as a relief during the famine and hunger so, control and stabilization of price is very important.

**Extract 1.8.1:** *A sample of good responses in question 10*

Extract 1.8.1 presents responses from a candidate who did well in the question. As seen in Extract 1.8.1, the candidate had good organization skill in essay writing and correctly explained the causes and control measures of price changes in agriculture.

Conversely, the candidates who had a weak performance (66.6%) failed to organize their essays into the key essay parts, namely introduction, main body and conclusion. In the main body, most of them failed to explain the causes and control measures of price changes in agriculture. Examples of incorrect responses given on the causes of price changes were; *unemployment, lack of capital, productivity, low income and government policy*. It was also observed that; some of these candidates mentioned the types of price changes such as; *annual, short term, long term and cyclical*, instead of explaining the causes of price changes. Similarly, the given incorrect responses for the control measures of price changes were such as; *educate people, increase salary, control market price, provide employment, increase tax of the people and supply labour*. The responses given are a sign of the lack of understanding of the causes and control measures of price changes in agriculture. Similarly, it is a revelation of poor essay organization skills among the candidates. Extract 1.8.2 is a sample of responses from the candidate who had a weak performance in the question.


10. Agricultural extension: Is the kind of educat ion produced by ministry agriculture and all people leaving in a rural area

The following are the causes of price chang e on value of farm produced.

Change of technology: This means the value of farm change price because of change in technology in the country and is source of a price change on value of farmer and this is source of causes of price change in the country it cause to rise and fall of on a value of farmer at a particular time.

10. Change of market on value of farm: This mean the value of farm can be Changed in the country for rise and fall in price of farm value because of Change in demand in the country for the purpose of rise and fall of price fluctuation

Change of market provision on farm: This mean the value of farm it can be rise and fall of the particular time because of change in market provision on the farm it cause rise and fall of price fluctuation at a Given time also is source of price to change because of change in market input.

The following are ways of protecting agricultural products from such changes.

To avoid produced quantity of goods and service without used change of technology on the farm: This mean farm must be used change of technology to proted agricultural product to rise and fall of good and service also it must be used technology for production of goods and service in a country.

To produce goods and service that can be used in the market provision: This mean the farm must be produce good and service that can be need by many people in the country for growth of economy on farm also it can be used to proted change in the demand in a country

The farmer it can be change demand that can be produced in the country: This mean the farm it can be produced demand that cant

10 be needed by many people and to change demand for improve economy growth in development of farm.

The farmer must be used skilled on produced quantity of goods and service to make equal quality: This mean the farm must be useed skill to produce quality goods and service for improve capital in the economy of farm also it must be used skilled to produce value need in the country to control change in a price of agricultural product.

The farmer must be provide data for planning feature production for bring more profit: This means the farm it can be produce goods and service that can be bring more profit and provide data for planning feature production for to increase economy growth of farm in the country and provide supply of agriculture input

Therefore: The following above are the causes of price changes and ways of protecting agricultural products from such changes and advise the farm to avoid causes above and to used ways of protecting agricutural production for a controlling change of price and demand also government should be support to suppress education on the farm on how to control causes of price changes for economy development of country.

**Extract 1.8.2:** *A sample of poor responses in question 10.*

Extract 1.8.2 is an example of poor responses in the question. Although the candidate organized his/her essay in key parts of the essay, he/she provided incorrect introduction and conclusions. Likewise, the candidate presented the wrong causes and control measures of price changes in agriculture in the main body.

### 2.3.2 Question 11: Poultry Farming

This question carried a total of 15 marks. The candidates were required to give six points on how feather pecking in poultry can be controlled. The question tested the candidates' understanding of behavioural problems in poultry.

The question was opted by 8,480 (50.5%) candidates out of which 636 (18.3%) candidates scored from 0 to 4 marks, 1,553 (44.6%) scored from 4.5 to 9.5 marks, and 1291 (37.1%) scored from 10 to 15 marks. The general performance of the candidates in this question was good. Figure 1.11 shows the distribution of the candidates' scores in the question.

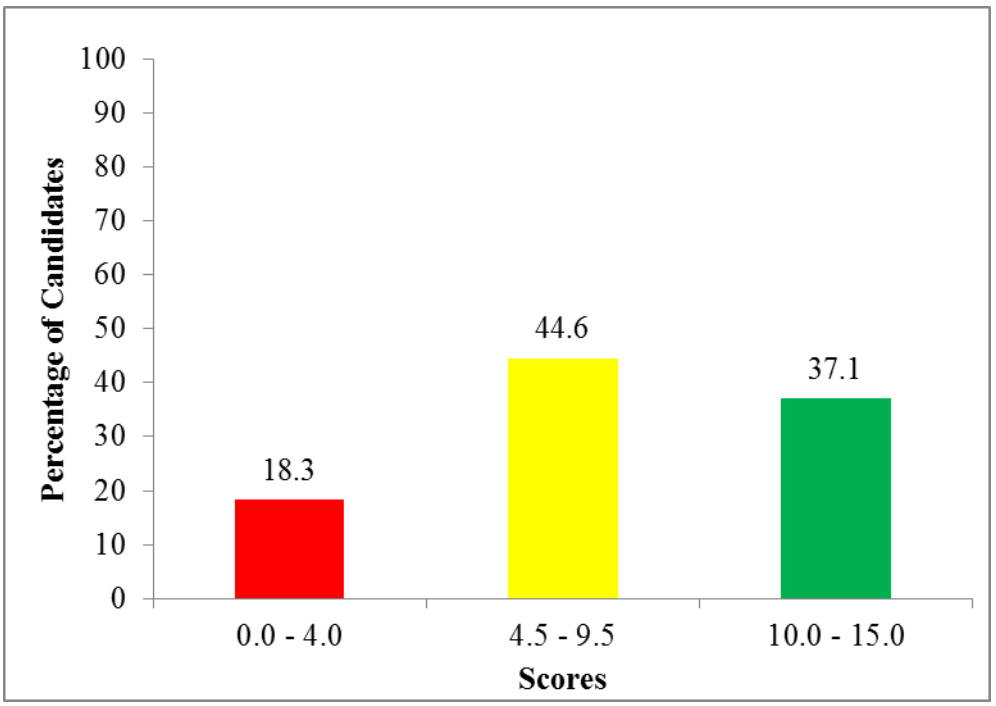



**Figure 1.11:** *The distribution of scores in question 11.*

Figure 1.11 illustrates the candidates' scores in the question, whereby the majority (81.7%) scored from 4.5 to 15 marks and 18.3 percent scored from 0 to 4 marks.

The analysis of the candidates' responses indicates that; the candidates who performed well (37.1%) correctly introduced the concept of feather pecking: the removal of feathers from one bird by another. Similarly, in the main body, they provided the correct responses on how to control feather pecking in poultry. The candidates explained responses such as; *keep the correct number of birds, de-beaking, supply green feeds to birds, provision of enough feeders and drinkers, provision of perches, culling of birds and provision of balance diet*. The candidates concluded their essays strongly, which shows that they had a good understanding of feather pecking in poultry.

On the other hand, 44.6 percent of the candidates had an average performance in the question. The analysis shows that, some of them introduced and concluded their essays correctly. In the main body, they did not exhaust all the control measures of feather pecking. Extract 1.9.1 portrays good responses from one of the candidates.

11. Vices refers to the bad habits develop by poultry in the poultry houses. Example of vices are cannibalism, toe pecking and feather pecking. Feather pecking is a vice developed by a poultry where by it tend to remove its feathers through biting them on its body or on another poultry. Broilers is a poultry kept for meat production. Vices such as feather pecking are highly discouraged in the poultry house, hence they need to be controlled. So the following are the measures on how to control vices in the poultry house.

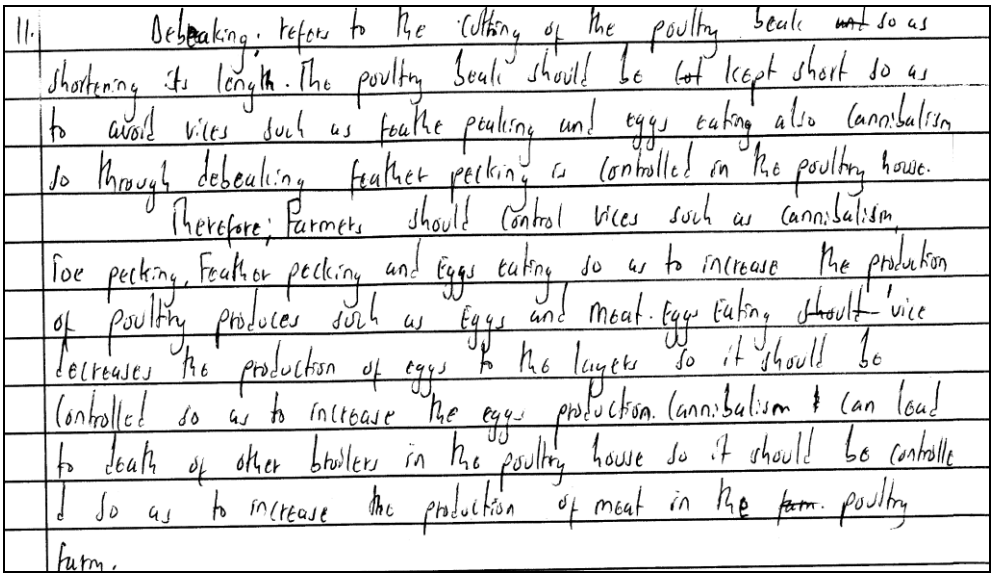
Avoid overcrowding of the poultry. Poultry in the poultry house should not be overcrowded because crowding them leads to the development of vices which results due to the shortage of space in the poultry house required for the poultry to do excercises by running ~~what~~ which will make the poultry busy.

Provide enough waterers and feeding trough. This will help to avoid competition of food among the poultry in the poultry house, hence poultry will not develop vices such as cannibalism in the poultry house and also feather pecking will be avoided.

Provide optimum light intensity in the poultry house. Poultry should ~~not~~ be exposed to dimlight this will help them not to develop vices due to not having a clear image of another poultry in the poultry house. exposing poultry to full ~~lig~~ light it may result to blindness to the poultry.

Provide poultry with green feeds. Green feeds such as roughages helps the poultry to digest well the food in the body and also it is the source of vitamin in the body of the poultry more especially broilers.

Choose a suitable system of keeping poultry. For broilers intensive system and semi-intensive system are suitable, but in order to avoid vices semi-intensive is the recomended system because it provides a poultry with a house and run where it can do physical excercise and keep it busy from practicising vices in the poultry house.


11. Debeaking, refers to the cutting of the poultry beak ~~not~~ so as shortening its length. The poultry beak should be ~~not~~ kept short so as to avoid vices such as feathe pecking and eggs eating also cannibalism so through debeaking feather pecking is controlled in the poultry house.
Therefore, Farmers should control vices such as cannibalism, foe pecking, Feather pecking and Eggs eating so as to increase the production of poultry produces such as Eggs and meat. Eggs eating ~~should~~ vice decreases the production of eggs to the layers so it should be Controlled so as to increase the eggs production. Cannibalism ~~i~~ can lead to death of other broilers in the poultry house so it should be controlle d so as to increase the production of meat in the ~~farm~~. poultry farm.

**Extract 1.9.1:** *A sample of good responses in question 11.*

In Extract 1.9.1, the candidate introduced and concluded the essay correctly. Similarly, he/she correctly presented the control measures of feather pecking in the main body.

On the contrary, 18.3 percent of the candidates had a weak performance in the question. It has been observed that most of them failed to organize essays into the key essay parts, namely introduction, main body and conclusion. They only presented every point on the main body. Even then, most of the responses for controlling feather pecking in poultry were incorrect. Most of them treated feather pecking as a disease instead of a bad behavior in poultry. Thus, their responses focused more on controlling livestock diseases. A sample of such candidates' responses are such as; *give medicine the birds*, *cleaning house of birds*, *vaccination*, *drenching*, *kill worm and parasite* and *disinfect the house*. This proves that, the candidates lacked knowledge of feather pecking in poultry. The candidates also exhibited poor essay writing skills. Extract 1.9.2 is an example of responses from a candidate who had a poor performance in the question.

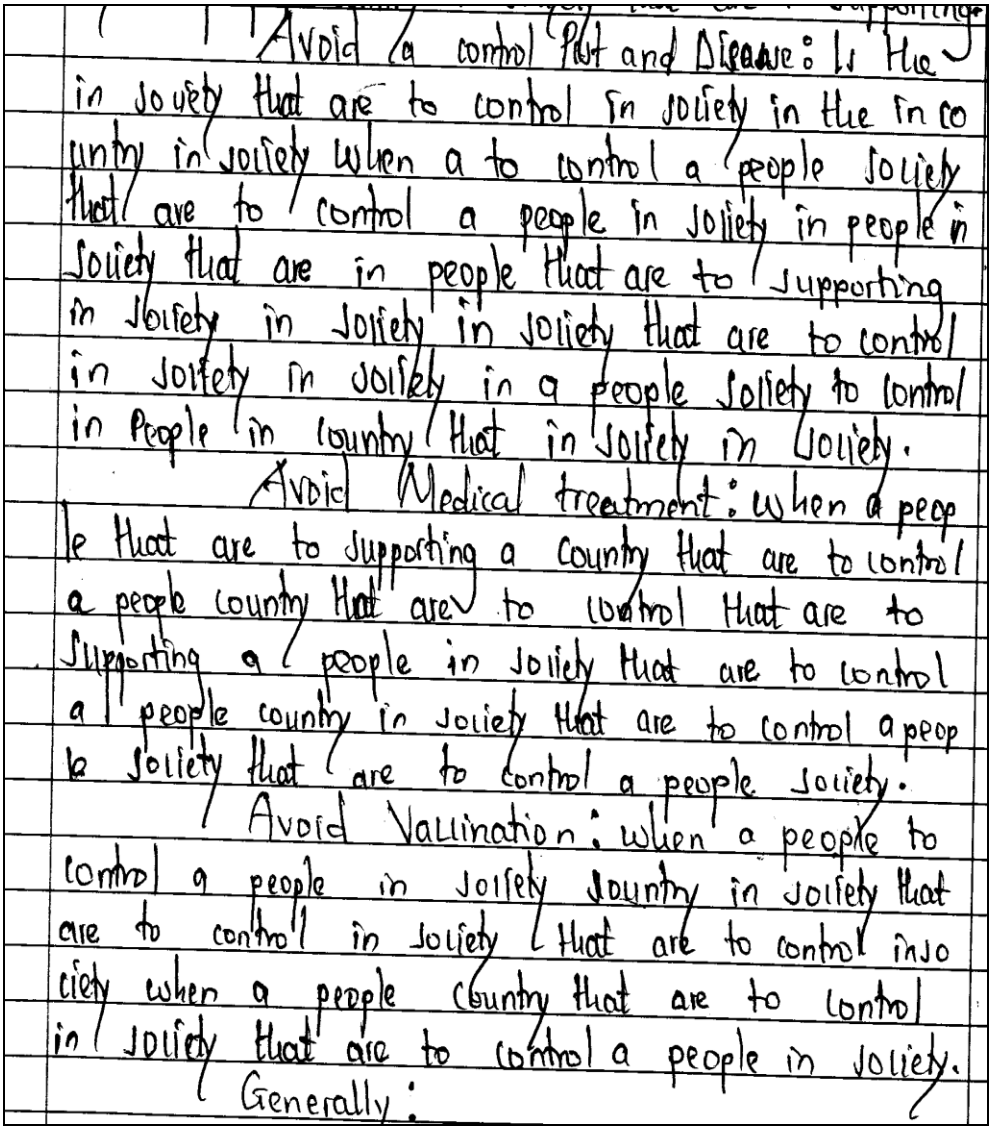
11. Habitat - is the place where a birds to live in areas that are supporting.

The following are how to control such habit

To Avoid source of water in area: When a people. that are can supporting a people country in society that are can controlling a people in society that are can supporting a people country in society when a people country that are to control a people in society that are to control a people in society

To Avoid source of food: when a people that are to control a people sourciety that are to - a people society that are to control a people in in the society when a people that it can supporting a people country that are to control a people and society that are to control a people in country when a people country that are supporting people.

11 Avoid clean environment: when a people that are to supporting a people country that are to supporting a people country when a people country in society when a country a people country a people country in society that a people in society in society in society in society when a people country in society that in society a people country in society that are to supporting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in society that are to control a people in society.
Generally:

**Extract 1.9.2:** *A sample of candidates' poor responses in question 11.*

Extract 1.9.2 shows one of the poor responses in the question. The candidate failed to introduce and concluded the essay properly. Moreover, he/she provided irrelevant responses to the question in the main body.

## 2.4 034/2- Agriculture 2

### 2.4.1 Question 1: Soil and its Agricultural Utilization; and Agricultural Mechanics

The question constituted part (a) and (b), carrying a total of 25 marks. In part (a), the candidates were provided with the following specimens, apparatuses and materials: **A** (sand), **B** (Loam soil), **C** (Clay soil), measuring cylinders, beakers, weighing balance, filter funnels, filter papers, stopwatch and cotton wool. The candidates were required to carry out the procedures hereafter and then answer the following questions:

**Procedure**

- Weigh separately approximately 50 g of each soil type labelled **A**, **B** and **C**.
- Put/plug an equal amount of cotton wool into the neck of each of the filter funnels labelled **A**, **B** and **C**.
- Put filter paper into each of the filter funnels labelled.
- Take three measuring cylinders labelled **A**, **B** and **C**.
- Put soil samples of the 50 g you have measured into the filter funnels as follows: soil sample **A** into filter funnel **A**, soil sample **B** into filter funnel **B** and soil sample **C** into filter funnel **C**.
- Place/mount the filter funnels with soil samples **A**, **B** and **C** onto measuring cylinders **A**, **B** and **C** respectively.
- By using 250 $cm^3$ beakers, pour 100 $cm^3$ of water into the filter funnels simultaneously.
- Wait for 15 minutes. Read and record the amount of water which has passed through in each soil samples in every measuring cylinder.

**Questions**

(i) Which measuring cylinder collected more water than the other two? Give a reason.

(ii) Which measuring cylinder collected less amount of water than the others? Give a reason.

(iii) What conclusion can you draw from the experiment you have done?

(iv) Give the name of the soil sample which its measuring cylinder collected less amount of water?

(v) Propose one best way that can be used to improve the water retention ability of the soil sample from the funnel which its measuring cylinder collected more water.

(vi) What are the six characteristics of the soil sample from the measuring cylinder which collects less amount of water in relation to its workability in the field?

This part set out to test the candidates' competence in analyzing the physical properties of the soil.

In part (b), the candidates were provided with the following specimens and materials: **W** (Rough file), **X** (Smooth cut file), **Y** (Bastard file) **Z** (Smooth file), hand lens and ruler.

With the aid of a hand lens, the candidates were required to observe the given specimens carefully and then count the number of teeth per centimetre in each specimen and then answer the following questions:

**Questions**

(i) Fill in the following table by giving the number of teeth per centimeter and type of a file for each of the specimen **X**, **W**, **Y** and **Z**.

| Specimens | Number of Teeth per cm | Type of File |
|---|---|---|
| **W** | | |
| **X** | | |
| **Y** | | |
| **Z** | | |

(ii) In reference to the number of teeth obtained in each specimen, give the ideal function of each type of file identified in part (i).

(iii) How would you care and maintain the given specimens after use in a given workpiece? Give two points.

This part tested candidates' competence in making observations to determine the types and functions of the files.

The question was attempted by 6870 (100%) candidates, out of which 1,577 (23.0%) candidates scored from 0 to 7 marks, 3,624 (52.7%) scored from 7.5 to 16 marks and 1,669 (24.3%) scored from 16.5 to 24 marks. These data

signify that; the performance in the question was good. Figure 2.1 presents the candidates' scores in the question.

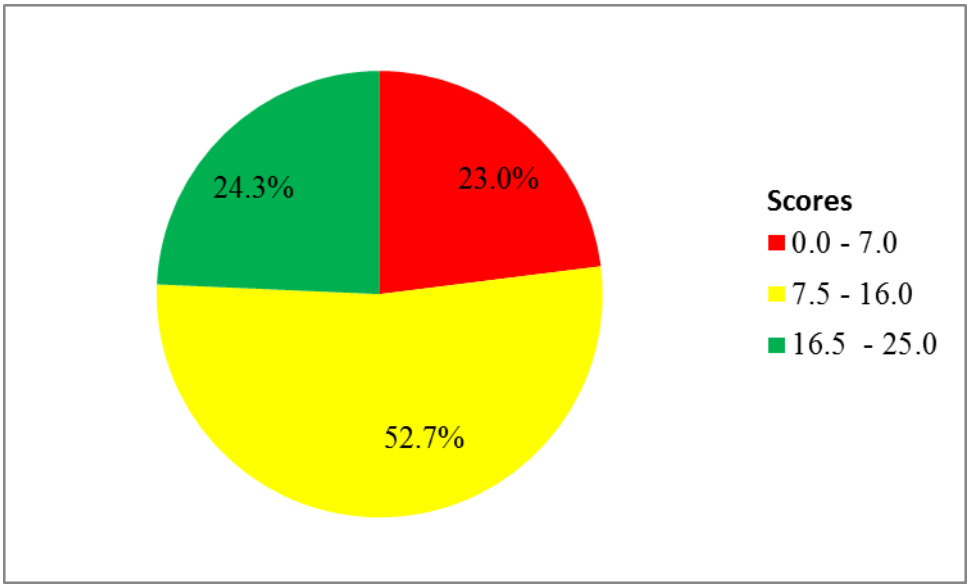



**Figure 2.1:** *The distribution of candidates' scores in question 1.*

Figure 2.1 shows that; majority of the candidates (77.0%) scored from 7.5 to 24 marks, whereas 23.0 percent scored from 0 to 7 marks.

Data analysis shows that; 24.3 percent of the candidates who attempted the question performed well. Based on the analysis of the candidates' responses, most of the candidates responded correctly to many parts of the question. In part (a), they showed good analytical skills of the physical properties of the soil. Likewise, in part (b), they demonstrated good observational skills in determining the functions of files in relation to the number of teeth. Examples of good responses to the question are shown in Extract 2.1.1.

1a) i) measuring cylinder ~~Sample~~ A collected more amount of water because has low water holding capacity than sample B and sample C and also has high pore spaces

ii) measuring cylinder C collected less amount of water because sample C has high water holding capacity than sample A and B and also has low pore spaces.

iii) The conclusion is sample A which is sand soil has low water holding capacity and sample B has moderate water holding capacity and sample C has high water holding capacity.

iv) The name of soil which measuring cylinder collected less amount of water is clay soil.

v) The best ways of improving water retention ability of soil sample from the funnel which measuring cylinder collected more water is by.

- Addition of organic manures in the soil sample and addition of inorganic fertilizers in the soil to improve water retention ability

vi) The characteristics of soil samples from measuring cylinder from measuring cylinder which collected less amount of water

1a)ii) Characteristics of clay soil

- It has high water holding capacity
- It is easy water lodging
- It cracks during the dry seasons.
- It has very small pore spaces.
- ~~Their~~ It is difficult to cultivate because particles are cemented to each other
- It is ~~not~~ poor aerated.

1b)

| Specimen | Number of teeth per cm | type of file |
|---|---|---|
| W | X 06 | Rough file |
| X | 13 | second cut file |
| Y | 10 | Bastard file |
| Z | 25 | smooth file |

ii) function of W (Rough file)

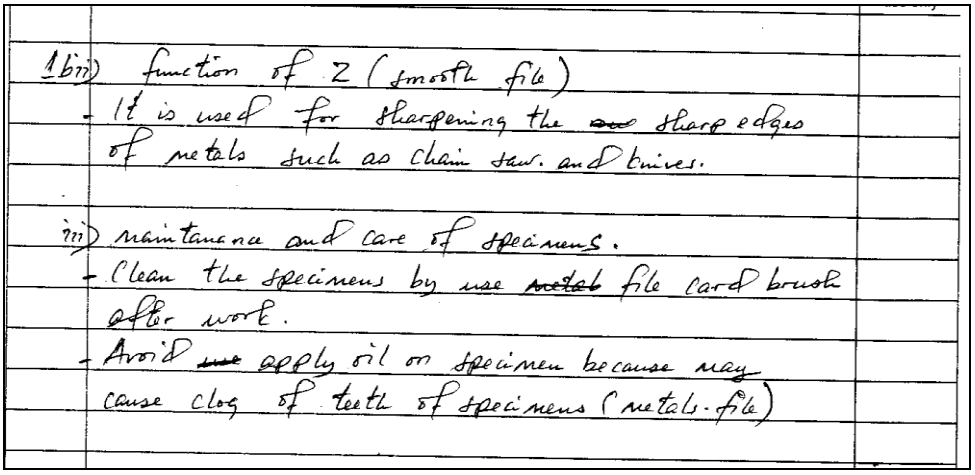
- It is used for smoothing the rough surface of metals

function of X (second cut file)

- It is used for smoothing the rough surface of wood and ~~shaping~~ ~~metals~~. Sharpening the sharp edges of metals

function of Y Bastard file

- It is used for smoothing rough surface of metals




**Extract 2.1.1***: A sample of good responses in question 1*.

Extract 2.1.1 is an example of good responses from one of the candidates. He/she responded correctly in all parts of the question, except for part (b) (i) and (ii), where he/she failed to name and give the function of a smooth cut file.

On the other hand, 23.0 percent of the candidates had a weak performance in the question. Most of the candidates failed in almost all parts of the question. Provision of incorrect responses in the question was attributed to failure of the candidates to follow the procedures of the experiments correctly. This resulted in obtaining incorrect results of the experiments, hence the candidates did not respond to the questions correctly.

In part (a) (i), the candidates named incorrectly the measuring cylinder, that collected more water than others. Some named *B* and others *C* instead of A. Likewise for the measuring cylinder which collected less water in part (a) (ii), some named *A* and others *B* instead of C.

In part (a) (iii), the candidates made incorrect conclusions from the experiments done. Most of the candidates stated different types of soil as conclusions. For, example *A is silt soil*, *B is clay soil*, *C is sand soil* instead of concluding that; soil in measuring cylinder A has low water holding capacity and high infiltration rate than soil samples in cylinder B and C.

In part (a) (iv), the candidate incorrectly named types of soil such *loam*, *sand* and *silt* as a soil sample, which collected less water instead of clay.

This indicates that; the candidates had inadequate knowledge of size and arrangement of particles in a soil sample in relation to water movements.

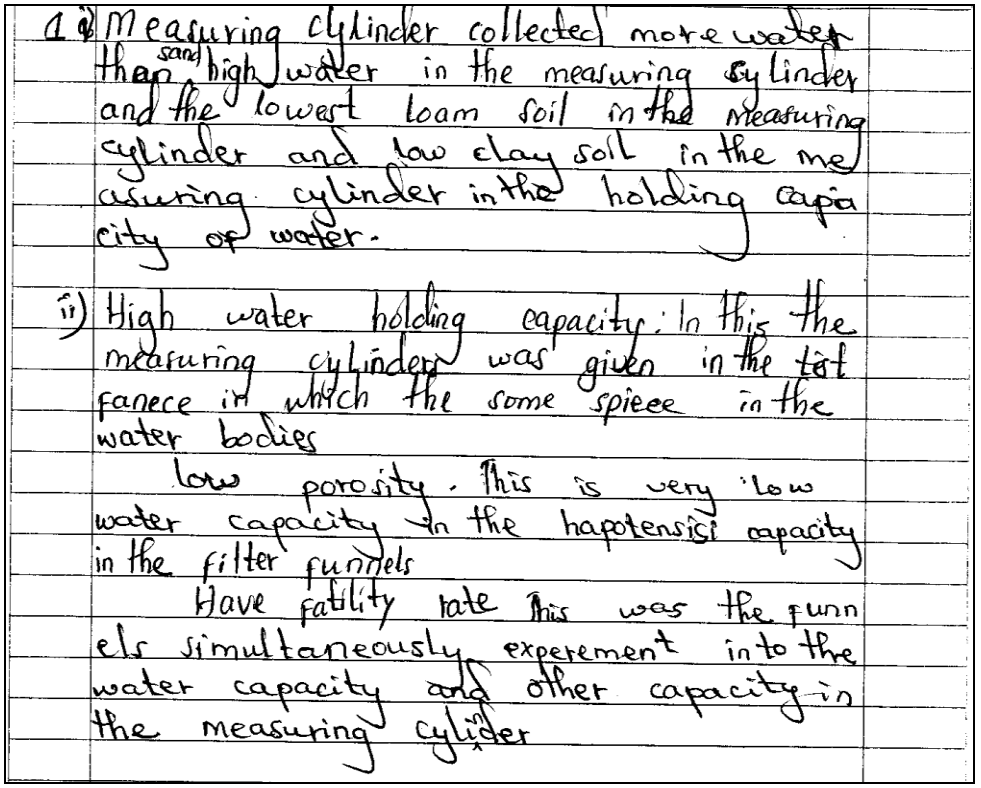
Furthermore, in part (a) (v), the candidates failed to propose the best way of improving water retention in soil whose cylinder collected more water. Examples of the incorrect responses provided were; *intercropping, crop rotation, mono-cropping, mixed cropping and addition of lime and acidification.* Most of the responses given were cropping systems and methods of soil rectification. However, the correct response was addition of organic matter.

In part (a) (vi), the candidate failed to give the characteristics of a soil sample from a measuring cylinder, which collected less water in relation to its workability. Some of the incorrect responses provided were; *low ph, high organic matter, good size, good water movements, low fertile* and *large space.* Some of the responses given were characteristics of other type of soil for example, low fertility and good water movements are characteristics of sandy soil. This implies that; the candidates lacked an understanding of the characteristics of the soil.

In part (b) (i), most of the candidates correctly counted the number of teeth per centimetre on files but failed to identify the corresponding types of files. The candidates mixed up the types of files. Consequently, in part (b) (ii), the candidates failed to give the function of different types with reference to the number of teeth in (b) (i). Examples of the incorrect responses were; *smooth file is used to clean the surface, is a metal tool* and *to cut metal*, rough file is used for rough surface, *used to rub on wood, use for shining wood* and *it is made up by metal*, *Bastard file is used to make hole, used to draw line in metal, used to control rust on metal* and *smooth cut file is used cut smooth, for sawing metal* and *measure angle.* Some of the candidates did not understand that files are metal tools by providing responses that relate files with woodwork. This justifies that; the candidates lacked an understanding of the functions of different types of files in relation to the number of teeth.

In part (b) (iii), the candidates failed to give the care and maintenance of files after use. Their incorrect responses are such as; *apply oil, sharp the tool, wash after use, tight loose bolt and nuts, use with two hands, pointed end face downward and wear gloves when using a tool.* Some of the

responses provided by these candidates were irrelevant to the care and maintenance for files instead; they were the care and maintenance for other tools. Other candidates pointed out the safety precautions in using some tools rather than the care and maintenance of files. The correct responses which the candidates should have given are such as; *use a file card to remove chipping of metal from its surface, replace handle when broken, store in a metal cabinet for future use, file should be wrapped in a cloth separately or kept upright in a stand so that they do not rub against each other and store files in a dry place to avoid rust*. Conclusively, most of the candidates were not conversant with the care and maintenance of files. Extract 2.1.2 represents the poor responses to the question.


1 (i) Measuring cylinder collected more water than (sand) high water in the measuring cylinder and the lowest loam soil in the measuring cylinder and low clay soil in the measuring cylinder in the holding capacity of water.

(ii) High water holding capacity: In this the measuring cylinders was given in the tot fanece in which the some spieee in the water bodies

low porosity. This is very low water capacity in the hapotensisi capacity in the filter funnels

Have fatility rate this was the funnels simultaneously experement into the water capacity and other capacity in the measuring cylinder

iii) The water is level in the measuring cylinder and high sand soil in the filter funnels and loam sois is lowest in the water in the. which through in the water channel in the capaccity.

iv) Sand soil

v High water holding capacity

vi) i) High capilarity
ii) Poor eareated

1 b i)

| Specimens | No of Teeth per cm | Type of File |
|---|---|---|
| W | 25 | Double File |
| X | 13-5 | Bastered file |
| Y | 24-3 | Rough File |
| Z | 10·2 | Rasp file |

i) Double file - Used the shappering or smooth the surface of metal

ii) Bastered file - It Used the smooth the surface of the matel

iii) Boug File - It used the shappering in the surface of the metal

iv) Rasp File - Used. smouth the sarface of the matel

iii) It used for smooth
ii) It Used for shapparing

**Extract 2.1.2:** *A sample of candidates' poor responses in question 1.*

In Extract 2.1.2, the candidate provided incorrect responses to all parts of the question.

### 2.4.2 Question 2: Livestock Production

The question constituted part (a), (b), (c), (d), (e) and (f), carrying a total of 25 marks. The candidates were provided with the following specimens and material: **$J_1$** (Tapeworms), **$J_2$** (Roundworm), **$J_3$** (Liver fluke) and Hand lens. The candidates were required to use a hand lens to observe the given specimens in their faces and then answer the questions that followed:

**Questions**

(a) From your observations, name the harmful organ(s) of each specimen.
(b) Draw and label simple diagram of each specimen to show destructive organ(s) named in (a)
(c) What are the function(s) of the organ(s) in each specimen named in (a)?
(d) Suggest three observable symptoms which are likely to be shown by the animals attacked by each of the specimen.
(e) Mention three harmful effects of each specimen to the host animal.
(f) What are the two common farm animals affected by each specimen?

The question set out to test the candidates' competence in observing and identifying harmful structures of internal parasites and their functions to host animals.

The question was attempted by 6,868 (100%) candidates of which 2324 (33.8%) candidates scored from 0 to 7 marks, 3,734 (54.4%) scored from 7.5 to 16 marks, and 810 (11.8%) scored from 16.5 to 25 marks. The general performance of the candidates in the question was good. The scores are presented in Figure 2.2.

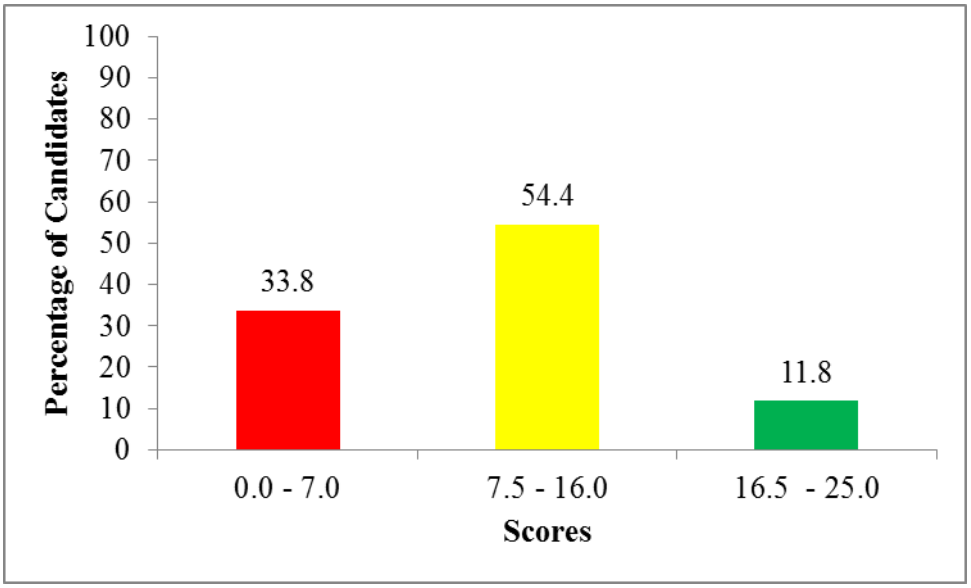



**Figure 2.2:** *The distribution of scores in question 2.*

Figure 2.2 shows that; most of the candidates (66.2%) scored from 7.5 to 25 marks, while 33.8 percent scored from 0 to 7 marks.

The data analysis has indicated that, 11.8 percent of the candidates who attempted the question had a good performance. The analysis of their responses shows that; they provided correct responses in almost all parts of the question. This proves that they possessed good observational skills and the ability to identify harmful structures on internal parasites of animals. Extract 2.2.1 is an example of good responses in the question.

2.

(a) For specimen $J_1$. the harmful organs are :-

(i) Hooks.

(ii) Suckers.

For Specimen $J_2$. the harmful organs are :-

(i) Mouth

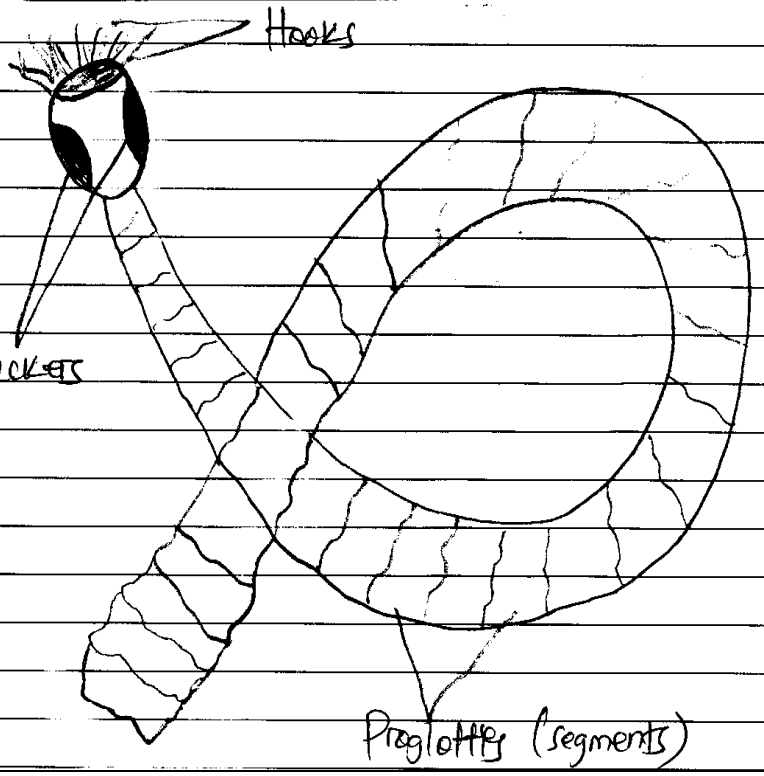
For Specimen $J_3$. the harmful organs are :-

(i) Ventral suckers.

(ii) Mouth covered with suckers.

(b)

A DIAGRAM OF SPECIMEN $J_1$.



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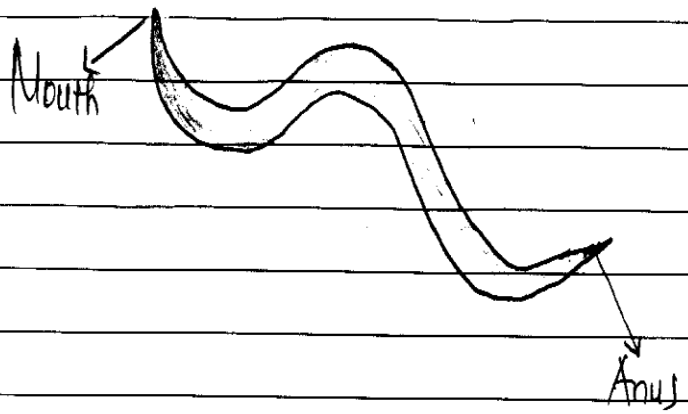
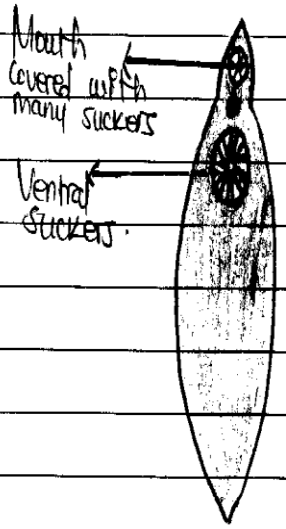
2. (b)

A DIAGRAM OF SPECIMEN J2.




A DIAGRAM OF SPECIMEN J3.



2. c) For specimen J1.

(i) Hooks - There are responsible for attachment onto the host.

(ii) Suckers - These helps it to suck already digested food in the host.

For specimen J2.

(i) Mouth - This helps it to absorb food in the host.

For specimen J3.

(i) Ventral suckers - There helps it to suck blood in the host ~~and~~.

(ii) Mouth covered with suckers - This helps it to suck blood from the host.

2. d) For specimen $J_1$. Observable symptoms are:
(i) Diarrhoea is sometimes observed.
(ii) Coat of an animal becomes rough.
(iii) Pot belly may develop.

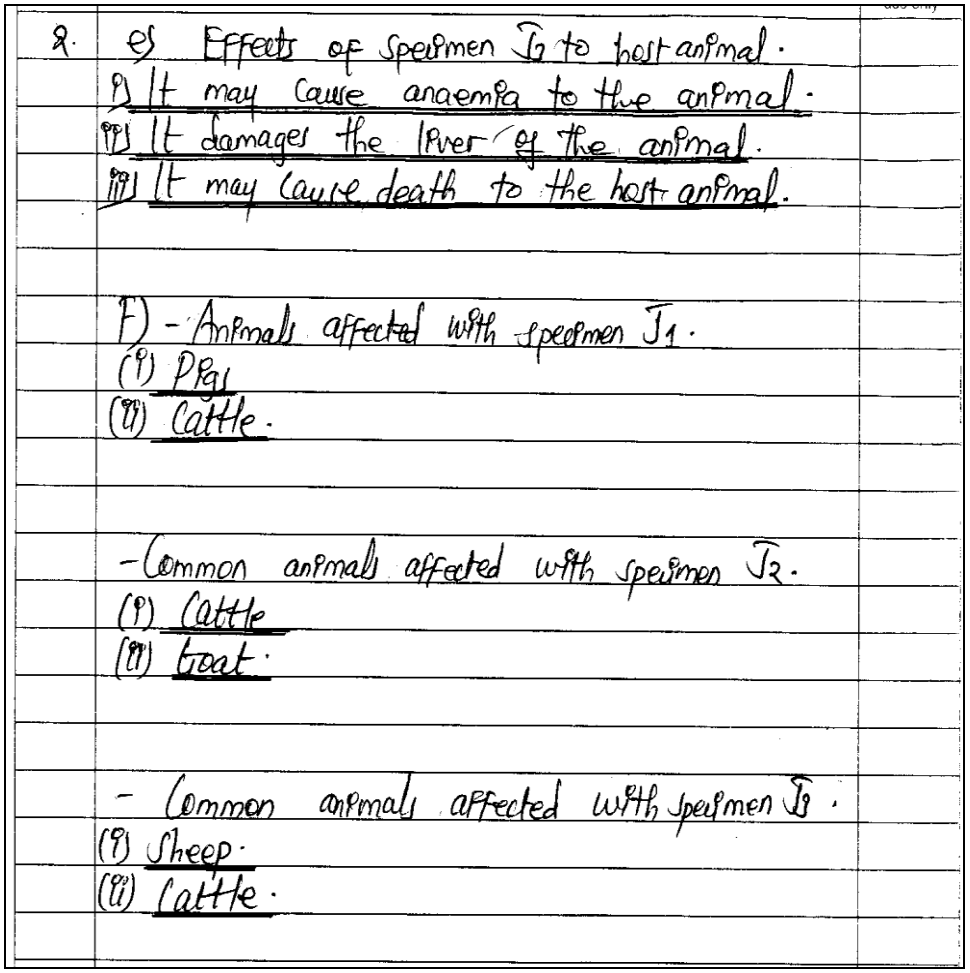
For specimen $J_2$. Observable symptoms are:
(i) Presence of worms in gut in large number.
(ii) Poor growth rate of an animal.
(iii) Reduced yield.

For specimen $J_3$. observable symptoms are.

(i) Swollen and painful abdomen.
(ii) Emaciation may be observed.
(iii) Diarrhoea may be observed.

e) Effects of specimen $J_1$ to the host animal.
(i) It may cause death to the host animal.
(ii) It may cause poor growth rate of an animal.
(iii) It reduces productivity of an animal.

Effects of specimen $J_2$ to the host animal.
(i) It may cause poor growth rate of an animal.
(ii) It may cause death to the animal.
(iii) It may lead to poor productivity of an animal.


2. e) Effects of specimen J3 to host animal.
(i) It may cause anaemia to the animal.
(ii) It damages the liver of the animal.
(iii) It may cause death to the host animal.

F) - Animals affected with specimen J1.
(i) Pigs
(ii) Cattle.

- Common animals affected with specimen J2.
(i) Cattle
(ii) Goat.

- Common animals affected with specimen J3.
(i) Sheep.
(ii) Cattle.

**Extract 2.2.1:** *A sample of good responses in question 2.*

Extract 2.2.1 exemplifies good responses in the question. The candidates possessed good practical skills and mastery of the subject matter; hence provided correct responses in all parts of the question.

Nevertheless, 33.8 per cent of the candidates had a weak performance in the question. In part (a), the candidates named organisms such as; *worms, earthworms, nematodes, roundworms* and *tapeworms* instead of identifying harmful structures in specimen **$J_1$**, **$J_2$** and **$J_3$**. This is indicating that, they lacked observational skills.

In part (b), most of these candidates presented diagrams of worms and labelled mouth and anus instead of drawing the specimens' diagrams

showing the harmful structures. The harmful structures were hooks and suckers in **$J_1$**, hooked mouth in **$J_2$** and suckers in **$J_3$**.

In part (c), most of the candidates provided incorrect functions of the harmful structures in specimens **$J_1$**, **$J_2$** and **$J_3$**. Instead of giving the function of each harmful structure, they gave collective functions such as; *cause diseases, add nutrients in the soil, live in animals, food for animals, improve soil structure* and *suck blood*. The responses provided were not related to the requirements of the question. This indicates candidates' poor understanding of harmful structures on the specimens and their functions.

In part (d), the candidates failed to suggest symptoms which are to be shown by animals infected with specimen **$J_1$**, **$J_2$** and **$J_3$** Most of the candidates provided the symptoms of various livestock diseases such as; *salvation, restless, removal of tears, lie down, removal of feathers, eyes sleep* and *constipation.*

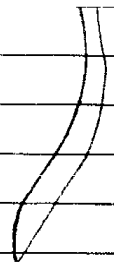
Furthermore, in part (e), most of the candidates mentioned the impacts of livestock diseases instead of the harmful effects of specimens' infection to the host animal. Examples of responses provided were; *cause disease to man, low economy, increase price of food, low manure, increase cost* and *reduce raw materials*. They would provide the following responses: **$J_1$** (damaged muscular organs with cysts which may not be suitable for consumption, anaemia, ulcers in the small intestine and digestive disorders which may be accompanied with diarrhoea or constipation), **$J_2$** (anaemia, ulcers in the small intestine, stunted growth, digestive disorders which may be accompanied with diarrhoea or constipation) **$J_3$** (digestive upset (disorders) caused by injured liver, gall bladder and sometimes blocked bile duct, the damaged liver which may not be suitable for consumption, death may occur due to hemorrhagic injuries in the liver caused by movements of the parasite and anaemia. In part (f), a few candidates failed to name the farm animals for specimens **$J_1$**, **$J_2$** and **$J_3$** Some of the candidates named animals such as chicken, dog, cat, duck, donkey and man. The candidates were unaware that some of the animals named were not farm animals, for example dog, man and cat. Others were farm animals, but which are not infected by the specimens, for example, chicken, donkey and duck. This suggests that, the candidates were not familiar with the farm animals, which are infected by the specimens. Extract 2.2.2 is a typical example of poor responses in the question.

28. (a) $T_1$ = Zigzag earthworm

$T_2$ = Round earthworm

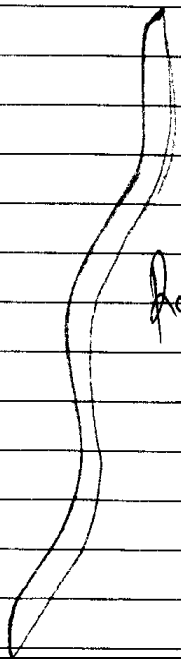
$T_3$ = Small earthworm

(b) $T_1$ =

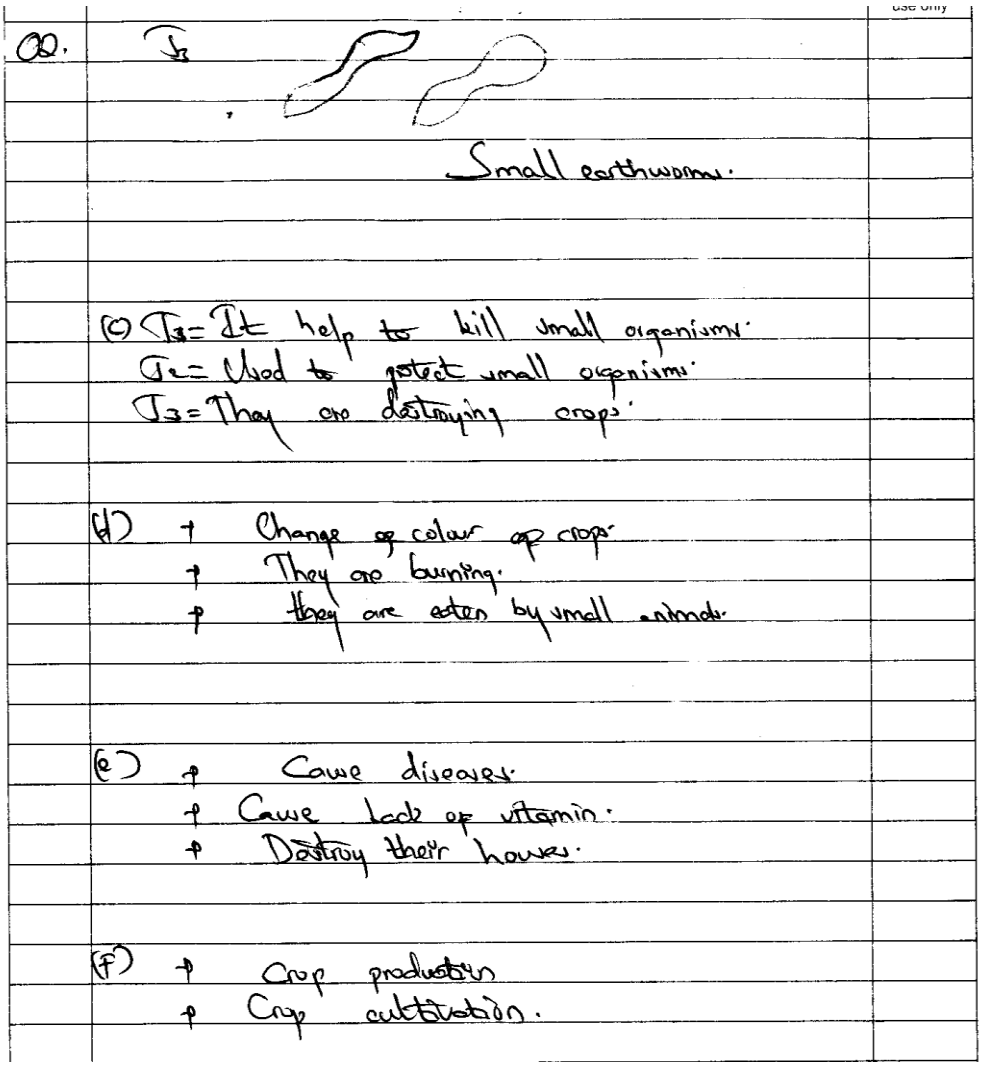


Zigzag earthworm

$T_2$



Round earthworm




**Extract 2.2.1:** *A sample of poor responses in question 2*

In Extract 2.2.2, the candidate provided responses that are irrelevant to the requirements of the question.

## 3.0 THE ANALYSIS OF THE CANDIDATES' PERFORMANCE IN EACH TOPIC/FIELD

A total of 12 topics were examined in a theory examination, out of which; 8 were examined by Multiple Choice Items and 8 by the short answer and essay questions. The topics examined by the short answer and essay questions were; Farm Surveying and Mapping, Poultry Farming, Environmental Degradation, Agricultural Marketing, Soil and Water Conservation, Physical Properties of the Soil, Annual Field Crops Production and Agricultural Prices.

The topics which were examined by Multiple Choice Items include; Farm Power, Farming Systems, Poultry Farming, Environmental Degradation, Principles of Livestock Production, Production of Horticultural Crops, Agricultural Marketing and Price and its Determinants.

In a practical examination, 3 fields were examined. The fields are; Livestock Production, Soil and its Agricultural Utilization and Agricultural Mechanics.

The analysis of the candidates' performance in each topic/field indicates that, the candidates had a good performance in Multiple Choice Items (89.8%). The topics which were well performed using Multiple Choice Items were Environmental Degradation (98.5%), Poultry Farming (77.2%), Soil and its Agricultural Utilization and Agricultural Mechanics (77%), Farm Surveying and Mapping (76.2%) and Livestock Production (66.2%).

However, the candidates had an average performance in the topics of Physical Properties of the soil (42.2%) and Agricultural Prices (33.4%).

Furthermore, the candidates had a weak performance in the topics of Annual Field Crops production (20.4%), Soil and Water Conservation (14.9%) and Agricultural Marketing (13.6%). The candidates' weak performance in the topics is attributed to inadequate knowledge of subject matter and failure to fulfil the requirements of the questions.

The performance of the candidates in different topics/fields is summarized in appendix 1, whereby green, yellow and red colours represent good, average and weak performance respectively.

## 4.0 CONCLUSION AND RECOMMENDATIONS

### 4.1 Conclusion

The general performance of the candidates in the CSEE 2020 Agricultural Science subject was good. Out of 6,811 candidates who sat for the examination, 5,453 (80.06%) candidates passed, while 1,358 (19.94%) failed. The performance shows a rise of 15.33 percent compared to the year 2019 results in which 64.73 percent of the candidates passed.

The majority of the candidates who passed (54.57%) scored high marks, with most of them (92.77%) attaining grade C. Good performance by the majority of the candidates was due to the possession of adequate knowledge of the subject matter and practical skills that enabled them to meet the requirements of the question. Conversely, 45.43 percent of the candidates who passed scored the lowest pass grade, which is D. Such candidates had relatively insufficient knowledge of the subject matter. The factors which made this 19.94 per cent of the candidates fail in the subject are such as;

(a) inadequate knowledge of the topics examined. This factor contributed much to the scoring of low marks by the candidates. The candidates rather provided incorrect responses or responses which were irrelevant to the question asked. In some cases this also made candidates fail attempting the questions. Example, in question 6, other failed to propose measures to be taken to control deficit in the balance of payments, hence provided responses that were irrelevant to the question asked.

(b) inability of some candidates to fulfil the requirements of the questions also made them score low marks. Example, in question 7, some of the candidates explained causes of soil erosion instead of explaining the types of terraces to be constructed in sloping areas to control erosion.

(c) some of the candidates failed to follow the procedures of practical examination fully. As a result, they arrived at the wrong results in their experiments, especially in question 1.

### 4.2 Recommendations

Three topics in this year's examination had weak performance. In order to improve the performance in the topics, the following are recommended to the education stakeholders, particularly teachers and students.

(a) In the topic of Agricultural Marketing which had the lowest level of performance (13.6%), teachers should use participatory teaching-learning techniques. For example, group discussion teaching techniques can improve the performance following that it generates more ideas about the topic and increases understanding of the subject matter.

(b) In the topic of Soil and Water Conservation which had 14.9 percent pass, teachers should use group discussion method and brainstorming method. Brainstorming, for instance, allows creative thinking and encourages everyone's viewpoint.

(c) In the topic of Annual Field Crops Production which had 20.4 percent pass, teachers should use the brainstorming method and farm visits. Farm visits, in particular, enable learners to observe the production process of the crops. Schools should also establish school farms to enable learners to actively participate in the stages of production.This is because students learn better by seeing and doing.

**Appendix 1**

**Performance of the Candidates in Different Topics/ Fields CSEE 2020**

| S/N | Topics/Fields | Question number | Percentage of the candidates who scored the average of 30% or above | Average | Comments |
|---|---|---|---|---|---|
| 1. | Farm Power, Farming systems, Poultry Farming, Environmental Degradation, Principles of Livestock Production, Production of horticultural crops, Agricultural Marketing and Price and Its Determinants | **1** | **89.8** | **89.8** | **Good** |
| 2. | Environmental Degradation | **5** | **85.5** | **85.5** | **Good** |
| 3. | Poultry Farming | **4** | **72.7** | **77.2** | **Good** |
| | | **11** | **81.7** | | |
| 4. | Soil and Its Agricultural Utilization and Agricultural Mechanics. | **1** | **77** | **77** | **Good** |
| 5. | Farm Surveying and Mapping | **2** | **67.2** | **76.2** | **Good** |
| | | **3** | **85.3** | | |
| 6. | Livestock Production | **2** | **66.2** | **66.2** | **Good** |
| 7. | Physical Properties of the Soil | **8** | **42.2** | **42.2** | **Average** |
| 8. | Agricultural Prices | **10** | **33.4** | **33.4** | **Average** |
| 9. | Annual Field Crops Production | **9** | **20.4** | **20.4** | **Weak** |
| 10. | Soil and Water Conservation | **7** | **14.9** | **14.9** | **Weak** |
| 11. | Agricultural Marketing | **6** | **13.6** | **13.6** | **Weak** |