CARIBBEAN EXAMINATIONS COUNCIL

CSEC® AGRICULTURAL SCIENCE

Subject Report with Exemplars

May/June 2024

CARIBBEAN EXAMINATIONS COUNCIL

REPORT ON CANDIDATES' WORK IN THE
CARIBBEAN SECONDARY EDUCATION CERTIFICATE®
EXAMINATION

MAY/JUNE 2024

AGRICULTURAL SCIENCE
GENERAL PROFICIENCY

Table of Contents

INTRODUCTION

Agricultural Science offers the Caribbean student a choice between two options, the Single Award (SA) and the Double Award (DA).

In 2024, 8893 SA candidates wrote the examination when compared with 9163 in 2023 and 7970 in 2022. Approximately 87.5 per cent of the candidates achieved acceptable grades (I–III) in 2023 when compared with 87 per cent in 2023 and 89 per cent in 2022.

In 2024, 1172 DA candidates wrote the examination when compared with 1081 in 2023 and 979 in 2022. Approximately 99 per cent of the candidates achieved acceptable grades (I–III) in 2024 when compared with 99 per cent in 2022 and 97 per cent in 2022.

The examination comprised the following papers.

Paper 01 — Multiple Choice (SA and DA)
Paper 02 — Structured Essay (SA and DA)
Paper 030 — Structured Essay (DA only)
Paper 030 — School-Based Assessment (SA only)

Paper 01 comprised 60 multiple-choice items worth a total of 60 marks, with 20 questions from each of the three profiles outlined in the syllabus for the SA and DA, that is, Profile 1 — The Business of Farming, Profile 2 — Crop Production, and Profile 3 — Animal Production.

Paper 02 comprised six compulsory structured essay questions worth 10 marks each. These questions were drawn from all three profiles and tested candidate's knowledge and comprehension (KC), and application (A) skills.

Paper 03, written by DA candidates only, was a compulsory paper with six structured essay questions. These questions were also drawn from all three profiles and tested candidates' knowledge and comprehension (KC), and application (A) skills. However, these questions were taken from Sections E and F of the syllabus, Crop and Animal Management Technologies, and Entrepreneurship and Communication in the Agricultural Sector.

PAPER 01 — MULTIPLE CHOICE (SINGLE AWARD AND DOUBLE AWARD)

Approximately 64 per cent of the SA candidates and 92 per cent of the DA candidates earned acceptable grades, I–III.

The mean scores for SA and DA candidates were 33.40 and 42.74 respectively.

PAPER 02 — STRUCTURED ESSAY

Paper 02 consisted of six compulsory questions. Each question was worth 10 marks. The mean scores for this paper were 17.94 for the SA and 28.57 for the DA.

SECTION I

Question 1

This question was based on Profile 1 and was taken from Section D (The Business of Farming) of the syllabus, from which two questions are usually selected for the examination.

Candidate's Response to Part (a)

(a) Define the term 'marketing' as it relates to agricultural production.

The Series of events in production of a product from the producer to the consumer. So basically the selling of ones product to the public or the selling of produce to the public Consumers and Customers.

(2 marks)

Examiner's Comments

Generally, candidates performed fairly well, with most of them being able to gain one mark. However, some candidates confused the term *marketing* with buying, selling and advertising, which were not accepted as correct responses.

The exemplar shows that the candidate was able to identify both parts of the definition, which emphasized the movement of the produce from the farmer/producer to the final consumer.

Candidate's Response to Part (b) (i)

(b) Mary produces vegetables on her 1-hectare farm. She gathers information from the Ministry of Agriculture's website regarding the demand and selling prices for vegetables in the main market segements in her country. Table 1 shows the quantity demanded and retail prices for each market segment.

TABLE 1: RETAIL PRICES AND QUANTITY DEMANDED FOR MAJOR MARKET SEGMENTS

Market Segment	Quantity Demanded	Retail Price
Hotels	100 kg	$20 per kg
Restaurants	300 kg	$10 per kg
Supermarkets	150 kg	$10 per kg
Greengrocers	200 kg	$6 per kg

(i) Suggest the best market segment to which Mary can supply her vegetables.

Restaurants ✓

.....

.....

.....

(1 mark)

Examiner's Comments

Generally, candidates' performance was fair, with most of them being able to gain one mark.

The exemplar shows that the candidate was able to identify restaurants as the best market segment.

The most popular incorrect response was 'hotels', as candidates used the highest retail price to make the decision.

Candidate's Response to Part (b) (ii)

(ii) State ONE benefit of having different market segments for agricultural products.

One befeft of having different market segment is improved profitability of the business

(1 mark)

Examiner's Comments

Candidates generally performed well and were able to score one mark. Popular correct responses were *make more money*, *income and profit*, and *diverse markets to sell produce*.

In the response shown in the exemplar, the candidate identified improved profitability as a benefit of having different market segments for agricultural products. Incorrect responses saw candidates repeating the term 'different markets', instead of stating one benefit of having different markets.

Candidate's Response to Part (c)

(c) James wants to grow tomatoes to sell to different market segments in his country. He is not sure how to go about marketing his produce so he seeks advice from the extension officer.

As the extension officer, outline THREE steps in the marketing process that James can take when marketing his tomatoes. You MUST provide **one** reason for EACH step.

Marketing step ..Advertisment.....

Reason ..James can advertise his product to the different market segments and see if anybody is interested in buying his produce.....

.....

Marketing step ..Packaging.....

Reason ..With the correct packaging of goods, it may catch the eyes of consumers and make them went to buy said product.....

.....

Marketing step ....Transporting.....

Reason ..James should ensure that the transport of his product is easy because if the products are damaged while trasporting consumers are less likely to ~~by~~ buy it.....

(6 marks)

Examiner's Comments

This part was done fairly well by candidates, who were generally able to correctly state at least one step and a corresponding reason.

The exemplar shows that the candidate identified and provided reasons for three marketing steps: advertisement, packaging and transportation. Other popular correct responses were *grading*, *sorting*, *labelling*, *advertising* and *processing*.

Recommendations

Students should be taught how to respond to questions posed and that they should avoid merely repeating the information in the stem of questions. Teachers should emphasize that the marketing process is not just buying and selling, but a process from the farm gate (postproduction) to the market or final consumer. The marketing steps should be taught in a logical manner and in their entirety. Students should be taught how to use data for decision-making, for example, linking price and quantity, in deciding the best market segment. Students should also be taught how to use agricultural terms in their responses.

Question 2

This question was based on Profile 1 and was taken from Section D (The Business of Farming) of the syllabus, from which two questions are usually selected for the examination.

Candidate's Response to Part (a)

(a) Differentiate between gross margin and net profit.

Gross margin is the profit attained once subtracting the variable expenses from the income whilst Net profit is the profit attained after subtracting all (variable & fixed) expenses.

(2 marks)

Examiner's Comments

Candidates' performance was fair. Most candidates were unable to distinguish between both concepts. It was observed that some candidates were more familiar with the concept of net profit.

In the exemplar, the candidate distinguished between how the gross margin and the net profit are calculated. Some candidates utilized the formulas to show the distinction.

Candidate's Response to Part (b) (i)

(b) Table 2 shows the income and expenditure of Kushi's poultry farm.

TABLE 2: INCOME AND EXPENDITURE FOR KUSHI'S POULTRY FARM

Income	$
Sale of broilers	1 500
Sale of eggs	1 000
Total income	2 500
Expenses	
Taxes	200
Fuel for machinery	500
Feed	400
Depreciation on machinery	300
Farm labour	1 000
Interest on loan	700
Medicines for bird	600
Insurance	200
Repairs to equipment	300
Total expenses	4 200
Gross margin	–300
Net profit	–1 700

(i) State ONE purpose of preparing income and expenditure statements for a farm enterprise.

To assess the profitability of ~~th~~ the farm/ operation / ~~Mar~~ ; To keep record

(1 mark)

Examiner's Comments

Candidates generally performed well on this part. They were able to state the purpose of preparing an income and expenditure statement.

In the exemplar, the candidate correctly identified profitability in the response. Other popular correct responses were *tracking income and expenditure*, and *profit and loss*.

Candidate's Response to Part (b) (ii)

(ii) From the information in Table 2, identify TWO fixed costs.

① Interest on loan ✓

② Insurance ✓

(2 marks)

Examiner's Comments

Candidates performed fairly well and were able to identify at least one fixed cost. However, there were some candidates who confused fixed costs with variable costs and so did not score any marks.

In the exemplar, the candidate identified interest on loan and insurance. Other popular correct responses included *taxes* and *depreciation on machinery*.

Candidate's Response to Part (b) (iii)

(iii) From the information in Table 2, state TWO variable costs.

① Fuel for mahenery ✓

② Feed ✓

(2 marks)

Examiner's Comments

Candidates performed fairly well and they were able to identify at least one variable cost. However, there were some candidates who confused variable costs with fixed costs and so did not score any marks.

In the exemplar, the candidate correctly identified fuel for machinery and feed.

Other popular correct responses were *feed*, *medicines for birds* and *repairs for equipment*.

Candidate's Response to Part (c) (i)

(c) (i) Kushi wants to take a loan from the bank to expand her farm. Using the information from Table 2 **on page 6**, suggest TWO reasons why Kushi would MOST likely be unable to obtain a loan for her farm.

Both ✓ Gross margin and net profit ✓ showed negative. The ~~income~~ total income is lower than total expenses ✓

(2 marks)

Examiner's Comments

Candidates performed poorly on this part. Some candidates were only able to identify one reason for Kushi being unable to obtain a loan.

In the exemplar, the candidate correctly identified negative gross margin and net profit. As shown in the exemplar, some candidates also stated that total income was lower than total expenses. Other candidates were also credited with one mark if they stated that *she was making a loss*. Candidates were not credited with a mark if they stated that 'she was making low profit', as this does not mean a loss.

Candidate's Response to Part (c) (ii)

(ii) Kushi still wants to be able to obtain a loan from the bank to expand her poultry farm. Suggest ONE action that she would need to undertake to be able to obtain a loan from the bank in the future.

.....

.....

Raise the price for eggs & broiler meat

.....

(1 mark)

Examiner's Comments

Candidates performed fairly well and were generally able to gain one mark.

In the exemplar, the candidate provided two correct responses (increasing the price of the broiler meat and eggs) but was credited with one mark, as the question required candidates to state one action. Other popular correct responses were *increase sales of broilers/eggs*, *find new markets* and *reduce expenses*. Candidates who stated, 'increase her income', without saying how, were not credited with the mark.

Recommendations

Business concepts should be taught in their entirety. Emphasis should be placed on ensuring that students understand the concepts of fixed and variable costs so that they move beyond merely memorizing the individual line items that comprise fixed and variable costs. Students need to understand what it means for a farm enterprise to be making a loss, that is total expenses are greater than total income. They also need to better understand the concepts of gross margin versus net profit. Examples should be provided to illustrate both concepts. The reasons for preparing income and expenditure statements need to be reinforced. Students need to be taught the difference between a budget and an income and expenditure statement, so that there is no confusion between the purposes of both tools.

SECTION II

Question 3

This question was based on Profile 2 and taken from Section B (Crop Production) of the syllabus, from which two questions are usually selected for the examination.

Candidate's Response to Part (a) (i)

(a) On a recent visit to Timothy's Hillside Farm in a hilly area in your country, Farmer Timothy told your class that topography is a key factor affecting soil fertility in the area.

(i) Define the term 'soil fertility'.

Soil fertility refers to how the percentage and minerals of organic matter in the soil and how well it can support and produce crops.

(2 marks)

Examiner's Comments

Generally, candidates performed fairly well, with most being able to gain at least one mark. Many candidates identified either supporting plant growth only or a soil rich in nutrients/optimal conditions only, in defining the term *soil fertility*.

In the exemplar, the candidate gave both aspects of the definition, that is, the soil providing essential nutrients to support plant growth. Other popular correct responses included

- when the soil has enough nutrients to support plant growth
- ability of the soil to support plant growth by providing the correct amount of nutrients
- refers to the nutrients in the soil and its ability to help plant growth.

Incorrect responses included the 'loosening and breaking down of the compact layer', 'how fertile the soil is', 'the pureness and healthiness of the soil'.

Candidate's Response to Part (a) (ii)

(ii) Describe TWO effects of topography on the fertility of the soil on Timothy's Hillside Farm.

Two effects are that erosion can occur (sheet) thus washing away the soil nutrients.

Farming on a hillside will be complicated as machinery cannot reach there to till the land and the soil will also be affected by environmental stress.

(2 marks)

Examiner's Comments

Generally, candidates performed well on this part.

In the exemplar, the candidate was able to correctly identify the washing away of nutrients and poor access by machinery. Other popular responses were *soil erosion* and *loss of nutrients*. Some incorrect responses were 'drainage'; 'crops can't grow on the soil because it is not fertile enough'; 'the soil can be very compact'; 'the hillsides have rocks, making it hard for planting' and 'poor weather conditions'.

Candidate's Response to Part (a) (iii)

(iii) Other than topography, state ONE factor that affects soil fertility.

climate is one other factor that affects soil fertility.

(1 mark)

Examiner's Comments

Generally, candidates answered this part very well.

In the exemplar, the candidate identified climate as one factor that can affect soil fertility. Popular correct responses included *improper or lack of drainage*; *slash and burn*; *soil biodiversity*; *soil pH*; *human activities*; *organic matter content*; *cultivation practices* and *monocropping*. Poor responses included 'pollination', 'constant water flow', 'land formation' and 'pollution'.

Candidate's Response to Part (b) (i)

(b) Farmer Timothy is a progressive farmer and wants to ensure that he uses the correct cropping systems to improve and/or maintain the soil fertility on his farm.

(i) Describe TWO possible cropping systems that Farmer Timothy can use to maintain soil fertility on his farm.

Cropping system ....Contour Cropping.... ✓

Description ....Contour cropping is planting crops.....

.....along the contour lines : this can help.....

.....prevent erosion and maintain fertility.....

.....

.....

Cropping system .....Strip Cropping..... ✓

Description .....Strip cropping is planting in a.....

.....line downlands : It is basei basically planting

.....crops strip by strip down the slope. The plants.....

.....will act as a barrier to prevent soil erosion.....

.....and maintaining fertility.....

(4 marks)

Examiner's Comments

Generally, candidates performed well and were able to name and describe at least one soil cropping system.

In the exemplar, the candidate correctly described contour cropping and strip cropping. The most popular responses were *crop rotation*, *intercropping* and *cover cropping*. Some candidates incorrectly listed cultural practices, farming methods/farming systems rather than cropping systems.

Candidate's Response to Part (b) (ii)

(ii) Other than using cropping systems, identify ONE additional method that Farmer Timothy can adopt to improve and/or maintain the soil fertility on his farm.

.....

Farmer Timothy can practice mulching.

(1 mark)

Examiner's Comments

Candidates performed well on this part, as they were generally able to provide the correct response.

In the exemplar, the candidate identified mulching as one method that can be adopted to improve and/or maintain soil fertility on a farm in a hilly area. Popular responses were *use of organic and inorganic fertilizers*, *ploughing soil to allow airflow and drainage*. It was observed that some candidates named cropping systems even though the question required candidates to suggest a method that improves and/or maintains soil fertility, other than cropping systems.

Recommendations

Teachers are encouraged to start practical work at the beginning of Form 4 (Grade 10) and to cultivate all the different crop types listed in the syllabus using various cropping systems (for example, crop rotation, intercropping, mixed cropping). The ongoing engagement in these practical activities will allow for the development of mastery in practical skills, greater theoretical understanding of the syllabus content and the application of students' theoretical understanding to real-life farming situations.

Also, teachers can consider using different cropping systems as possible treatments in the Crop Investigative Project. Field trips are also encouraged, to enable students to gain exposure to different cropping systems in areas with different topography and soil types.

In addition, emphasis must also be placed on the correct spelling of agricultural terms.

Question 4

This question was based on Profile 2 and was taken from Section B (Crop Production) of the syllabus, from which two questions are usually selected for the examination.

Candidate's Response to Part (a) (i)

(a) Figure 1 shows the diagram of a typical plant cell.

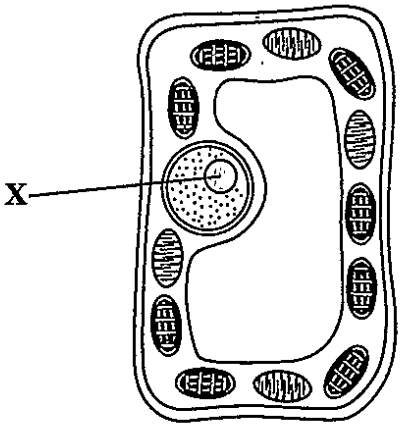


Figure 1. Diagram of a typical plant cell

(i) State the name of the part labelled X in Figure 1.

~~Nucleus~~ Nucleus ✓

(1 mark)

Examiner's Comments

Generally, most candidates performed well on this part, correctly identifying the labelled part as the nucleus. However, many candidates were unable to correctly spell the word *nucleus*.

Candidate's Response to Part (a) (ii)

(ii) State ONE main function of the part labelled X.

Part X controls all activity in the cell. ✓

(1 mark)

Examiner's Comments

Most candidates performed well on this part. Responses showed a general pattern in that those candidates who correctly identified the name of the organelle in Part (a) (i) also knew the function.

In the exemplar, the candidate provided a correct response: controls the activities of the cell. Popular correct responses included *carries the genetic material/information, controls all cell activities, plays a role in cell division, control centre/brain of the cell, carries genetic information*. Incorrect responses included 'stores food', 'protects plants from diseases', 'provides cell with energy', 'helps the cell to be fertilized', 'allows the cell to maintain its shape'.

Candidate's Response to Part (a) (iii)

(iii) State the type of cell division that occurs in the reproductive organs in plants.

✓ Meosis is the typ of cell division.

(1 mark)

Examiner's Comments

Candidates' performance on this part was fair, with some candidates correctly providing meiosis as the response. It was observed that many candidates were unable to spell the word *meiosis* correctly, as shown in the exemplar. Many candidates incorrectly identified 'mitosis' instead of *meiosis*.

Candidate's Response to Part (b) (i)

(b) Many thin-skin tropical crops cannot be easily exported because they are damaged during handling and shipping. As a result, the Regional Agricultural Research and Development Institute has been working with farmers to develop a new variety of hot pepper for export.

The plant breeder crossed a pure-bred, thick-skin hot pepper with a pure-bred, thin-skin pepper, where **T** represents the allele for thick-skin and **t** represents the allele for thin-skin.

(i) State the genotypes of the parents.

TT and tt

.....

.....

(2 marks)

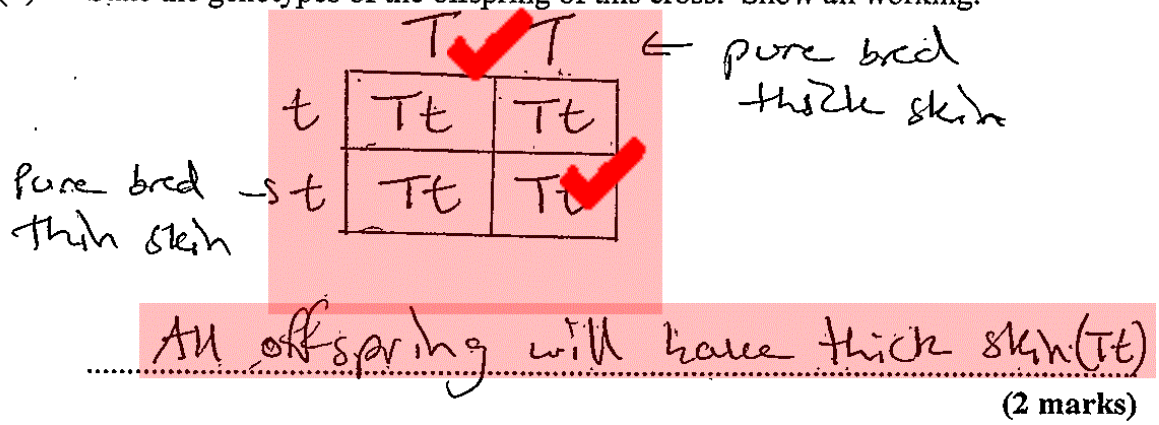
Examiner's Comments

Generally, candidates performed well on this part. However, in some cases, candidates confused phenotype and genotype.

In the exemplar, the candidate provided the correct response, *TT* (homozygous dominant) and tt (homozygous recessive). Poor responses included 'Tt', 'heterozygous', 'homozygous' and 'pure-bred'.

Candidate's Response to Part (b) (ii)

(ii) State the genotypes of the offspring of this cross. Show all working.



(2 marks)

Examiner's Comments

Generally, candidates' performance was fair. Many candidates had difficulty working out the genetic makeup of the offspring, even though sufficient information was provided on the parents. Those candidates who performed well drew a Punnett square (as shown in the exemplar) to show their working and to determine the offspring. However, where candidates performed poorly, they gave incorrect genotypes for the parents, thus resulting in inaccurate genotypes for the offspring.

Candidate's Response to Part (b) (iii)

(iii) Determine how many of the offspring will have a thin-skin phenotype and how many will have a thick-skin phenotype.

100% of offspring will have thick skin phenotype while 0% will have thin skin phenotype

(2 marks)

Examiner's Comments

Generally, candidates only provided partial responses (for example, 100% of the offspring have a thick-skin phenotype) and did not state the number of offspring with a thin-skin phenotype, thus losing one mark. Candidates generally did not mention zero/no thin skin in their answers even though the question specifically asked for the number of thick-skinned offspring and the number of thin-skinned offspring.

In the exemplar, the candidate correctly identified 100% thick skin and 0% thin skin. Other popular responses were *all will have thick skin* and *none will have thin skin*.

Candidate's Response to Part (c)

(c) Some vegetable seeds that are sold in agricultural shops have been produced by commercial seed-producing companies using genetic engineering.

Suggest ONE benefit farmers may get from growing genetically engineered crops.

Genetically engineered crops can be genetically altered to withstand or certain disease, produce greater yeilds etc. Hence it can reduce the chances for economic losses and increase profitability. **(1 mark)**

Examiner's Comments

Generally, candidates performed well on this part, with most of them being able to gain one mark.

In the exemplar, the candidate identified disease resistance and greater yields as correct responses but was credited with one mark as the question asked for one benefit. Other popular responses included *resistant to environmental stress; increase crop yields*; *grow faster*; *grow bigger*; *will have the desired traits the farmer wants* and *longer shelf life*. Incorrect responses included 'farmers will have more profit' and 'farmers will get healthier crops'.

Recommendations

Teachers should provide students with ample opportunities to practise questions on genetic inheritance, plant breeding and how characteristics are passed on from parents to offspring. In addition, emphasis must also be placed on the correct spelling of agricultural terms.

SECTION III

Question 5

This question was based on Profile 3 and was taken from Section C (Animal Production) of the syllabus, from which two questions are usually selected for the examination.

Candidate's Response to Part (a)

At a workshop on broiler production, an extension officer showed the information in Table 3 for broiler birds produced by two broiler farmers. He stated that the broiler birds are first slaughtered and dressed before they are sold to the consumer. He further explained that the dressing percentages of the broiler flocks are of economic importance to the two farmers.

TABLE 3: INFORMATION ON BROILER BIRDS PRODUCED BY TWO FARMERS

	Live Weight	Dressed Weight
Farmer A	2 kg	1.5 kg
Farmer B	2 kg	1.6 kg

(a) State the **three** MAIN steps to be followed when dressing a broiler bird.

*Bird must be plucked and stripped of feathers and other outer parts.

*Internal organs of the bird must be removed.

*The head, feet, beak and other un-necessary parts must be remove.

(3 marks)

Examiner's Comments

Generally, candidates performed well on this part. Most candidates were able to state *defeathering and the removal of internal organs/offal* as part of the dressing process.

In the exemplar, the candidate demonstrated knowledge of the process involved in dressing a broiler and was able to answer the question correctly, stating removal of feathers, internal organs and head and feet. *The washing of the bird* was also accepted as a correct response.

Candidate's Response to Part (b)

(b) Suggest ONE way in which dressing percentage is of economic importance to the farmers.

The dressing percentage shows the percentage of live weight obtained as edible carcass after slaughtering. farmers use this information to add price to the meat since a higher dressing percentage generates more income. **(1 mark)**

Examiner's Comments

Generally, candidates performed well on this part, as most were able to identify the economic importance of dressing percentage in broiler production.

In the exemplar, the candidate was able to associate how much edible meat will be present after slaughter, with the farmer earning more income. The other popular correct response was *the greater the dressing percentage, the more profit is earned by the farmer*.

Candidate's Response to Parts (c) (i) and (ii)

TABLE 3: INFORMATION ON BROILER BIRDS PRODUCED BY TWO FARMERS

	Live Weight	Dressed Weight
Farmer A	2 kg	1.5 kg
Farmer B	2 kg	1.6 kg

(c) Calculate the dressing percentage for the broiler flock of

(i) Farmer A

Dressing % = $\frac{\text{Dressed Weight}}{\text{Live Weight}}$ X 100

Dressing % = $\frac{1.5 \text{ kg}}{2 \text{ kg}}$ X 10

Dressing % for Broiler flock of farmer A

= 75 %

(ii) Farmer B.

Dressing % = $\frac{1.6 \text{ kg}}{2 \text{ kg}}$ X 10

Dressing % of Broiler flock for farmer B

= 80 %

(4 marks)

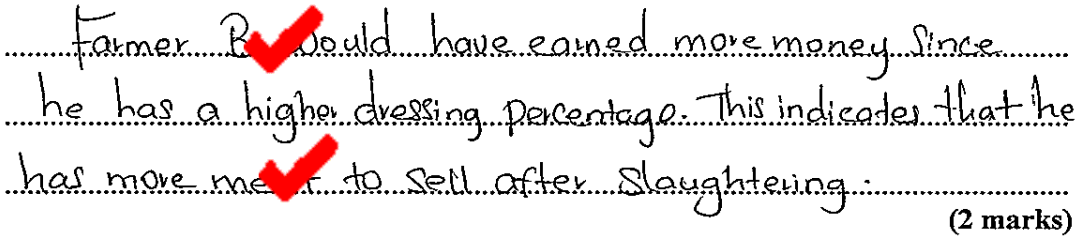
Examiner's Comments

These parts were answered correctly by most candidates, as they were able to calculate the dressing percentage.

In the exemplar, the candidate was able to correctly use the formula to calculate the dressing percentages for Farmers A and B. However, candidates who did not know the formula were unable to calculate the dressing percentages for both farmers.

Candidate's Response to Part (d)

(d) Using your calculations for Farmer A and Farmer B in part (c), identify the farmer who would have earned more money from the sale of his broilers. Give ONE reason for your answer.



(2 marks)

Examiner's Comments

Most candidates performed well on this part and were able to state that Farmer B had a higher dressing percentage.

In the exemplar, the reason provided by the candidate was that the farmer would have more meat to sell. Another popular correct response was *more yield* and *more income/money*.

Recommendations

Teachers are encouraged to continue to start practical work at the beginning of the Form 4 (Grade 10) term and to rear all classes of livestock using various animal management systems, as listed in the syllabus. Ongoing engagement in these practical activities will allow students to develop mastery in practical skills, to acquire greater theoretical understanding of the syllabus content and to apply their understanding to real-life situations. Field trips are also encouraged so students can gain additional exposure to broiler production.

Question 6

This question was based on Profile 3 and was taken from Section C (Animal Production) of the syllabus, from which two questions are usually selected for the examination.

Candidate's Response to Part (a)

Farmer Ben inherited five hectares of land in the countryside and wants to set up an apiary to produce honey for sale.

(a) Suggest THREE factors Farmer Ben must consider when siting an apiary for his bees if he wants to maximize honey production.

Ensure the apiary is away from waterlogged areas to prevent predators. Ensure all equipments are well sanitized. Ensure it is away from direct sunlight.

(3 marks)

Examiner's Comments

Generally, candidates demonstrated knowledge of the area tested in the question and were able to respond satisfactorily.

In the exemplar, the candidate correctly stated the three factors to consider when siting an apiary. The most popular responses were *away from predators, close to flowers* and *partially shaded areas*.

Candidate's Response to Part (b)

(b) Farmer Ben wants to increase his honey production. He was informed that worker bees are a critical part of the honey production process.

Describe TWO ways in which the social activities of the worker bees would contribute to increased honey production in Farmer Ben's hives.

- Worker bees are the ones responsible for honey production. They search for flowers to collect nectar. They swallow this nectar which is mixed with digestive enzymes in their stomach and regurgitate it to other bees, thus producing honey.
- The worker bees are also responsible for feeding larvae which will continue the colony thus increasing honey production. They ensure that larvae are safe from predators as well.

(4 marks)

Examiner's Comments

This question was poorly done. While most candidates could identify the social activities of the worker bee, they were unable to state how the worker bee contributed to increased honey production.

In the exemplar, the candidate identified and explained the conversion of nectar into honey and feeding bee larvae. *Converting nectar to honey* and *protecting the hive* were the most popular responses to this question.

Candidate's Response to Part (c) (i)

(c) Farmer Ben sells his honey to a large supermarket chain but there are complaints about the poor quality of the honey.

(i) Suggest ONE cause for the poor quality of the honey produced by Farmer Ben.

The poor quality of honey can be as a result of
farmer Ben's poor preparation of the honeyhe may be
mixing his honey with sugar to ~~provide~~ satisfy the high
demands of the large supermarket

(1 mark)

Examiner's Comments

This part was fairly done by candidates. Most candidates were able to obtain the allocated mark.

In the exemplar, the candidate correctly identified adulteration of the honey by the addition of the sugar solution. The most popular correct responses were *poor health/diseases of the bees*, *poor storage conditions/improper storage*, *unstrained/unfiltered honey* and *poor packaging*.

Candidate's Response to Part (c) (ii)

(ii) Suggest TWO management practices Farmer Ben can implement to prevent the production of poor quality honey.

1) Farmer Ben can provide supplements to bees in appropriate quantities to encourage them to be more productive.

2) Relocate the apiary so that bees would have better access to flowers or away from predators and this in turn will improve the quality of honey.

(2 marks)

Examiner's Comments

Most candidates performed well on this part, as they were able to provide two management practices which, if implemented, could prevent poor quality honey.

In the exemplar, the candidate correctly identified proper storage of the honey and filtering of the honey. The most popular correct responses were *proper sanitation practices*, *proper packaging of the honey* and *avoid using insecticides/pesticides and pollutants close to the hive*.

Recommendations

Teachers are encouraged to teach the syllabus in its entirety. More work needs to be done to improve students' knowledge of the social activities of bees and their understanding of how these activities can increase honey production. A field trip to an apiary is also encouraged so students can gain additional exposure to beekeeping and honey production.

PAPER 03 — STRUCTURED ESSAY

Question 1

Candidate's Response to Part (a) (i)

1. (a) Joan is a recent business school graduate who has inherited five hectares of land from her grandmother. The land was used to grow fruit trees, vegetables and root crops, which her grandmother sold to middlemen. Joan is not sure what to do with the farm, as she never did Agricultural Science in school.

Joan recently attended a workshop hosted by the Ministry of Agriculture, which provided information on goat rearing. The extension officers told Joan and the other participants that goat farming was profitable, and that the ministry has organized markets with supermarket chains and hotels. They also learnt that the Ministry of Agriculture was providing graduates with grants to start their goat farming enterprises. Livestock extension officers are also willing to provide technical support to farmers, especially given the disease outbreak among goats in the country.

Joan is excited at the prospect of receiving assistance from the government to start a livestock farm, since she has no experience in rearing livestock. She is a bit cautious as the newspapers reported that there were several thefts of livestock in the area in which her farm is located.

Using the case study above, develop a SWOT analysis for Joan as she considers establishing a goat farm. Provide the information requested by completing EACH part below.

(i) TWO strengths

Having a Suitable market to Sell your goats

Having ~~a~~ ~~having~~ access to an area of land.

(2 marks)

Examiner's Comments

Candidates performed fairly well on this part. Many candidates scored one mark for identifying one strength. Some candidates confused opportunities with strengths and so gained no marks.

In the exemplar, the candidate identified two strengths, having a suitable market to sell goats and access to land.

Candidate's Response to Part (a) (ii)

(ii) ONE weakness

*She has no experience in rearing livestock.

(1 mark)

Examiner's Comments

Candidates performed fairly well on this part, with most of them being able to score one mark. Some candidates confused weaknesses with threats and so did not gain the allocated mark.

In the exemplar, the candidate correctly identified no evidence of rearing livestock as a weakness. Other popular responses included *no experience* or *lack of knowledge in rearing livestock/agriculture*.

Candidate's Response to Part (a) (iii)

(iii) TWO opportunities

~~She will gained high profit since goat farming is profitable~~ and she will have technical support by the livestock extension officers and ministry of Agriculture was providing graduate with grants to start their goat farming enterprises.

(2 marks)

Examiner's Comments

Candidates performed satisfactorily and were able to gain one or two marks.

In the exemplar, the candidate correctly identified technical assistance given by livestock officers and grants being made available to graduates. Other correct responses included *goat farming can be profitable* and *markets are available for goat meat*.

Candidate's Response to Part (a) (iv)

(iv) ONE threat

praedial larceny

(1 mark)

Examiner's Comments

This part of the question was well done, as candidates were generally able to identify one threat.

In the exemplar, the candidate responded by stating praedial larceny, which was the most popular correct response given by candidates.

Candidate's Response to Part (b)

(b) The Ministry of Agriculture in your country is considering using social media to communicate with farmers. State TWO advantages and TWO disadvantages of using social media to communicate with farmers.

Advantages

1. It will be more easier to communicate using social media since people are obsessed with social media and tend to use it more.
2. Social media will be the quicker way to communicate or send information to farmers rather than held meetings in a building.

Disadvantages

1. Some people are less fortunate and will not get access to internet
2. The greater the number of listeners the more harder it will be to communicate using social media.

(4 marks)

Examiner's Comments

Candidates generally performed well on this part, scoring at least three marks.

In the exemplar, the candidate correctly stated advantages such as farmers receiving information faster and being able to remain in their homes. For the disadvantages, the candidate correctly stated one disadvantage as no access to the internet. The candidate earned no marks for the other disadvantage stated.

Recommendations

Teachers should use scenarios to teach SWOT analysis and should ensure that students understand the difference between opportunities and strengths, and weaknesses and threats. Teachers and students should remain up to date with new and evolving communication methods, their advantages and disadvantages.

Question 2

Candidate's Response to Part (a) (i)

2. (a) Mark is a software engineer. He is looking for business opportunities to increase his income. At a recent webinar, he learnt that tilapia farming is a lucrative business. He has decided to start a tilapia fish farming business. His fish will be sold on the local market. He plans to hire unemployed and unskilled young people from the community. Mark plans to leave one of them to oversee the daily operations of his business. He is hoping that this business will be profitable and help him to accomplish his financial goals.

(i) Using the case study, identify ONE factor that could cause Mark's fish farm to fail. You must give a reason for your response.

Factor Leaving an unskilled person on the farm will mostly cause mark's plan to fail.

Reason The unskilled person mostly do not know anything about manggin the farm, as well as handling the equipments and tools.

Examiner's Comments

Generally, candidates performed well on this part. Many candidates scored two marks for stating one factor and a corresponding reason for the failure of Mark's fish farm.

In the exemplar, the candidate cited the use of unskilled workers on the farm and provided an explanation. This was the most popular response provided by candidates. Other correct responses were *poor management*, *poor financial management*, *no expertise in/knowledge of fish farming* and *absentee owner*.

Candidate's Response to Part (a) (ii)

(ii) Identify TWO factors that Mark must consider to ensure the success of his fish farm enterprise. You must give a reason for your response.

Factor Business Plan

Reason The key determinant of the success of a business is success of that business one major factor in the business in doing so you can provide with an opportunity to get a loan and the finances necessary.

Factor Education

Reason The first factor that a farmer must possess when considering to start an enterprise is the education and knowledge in that field of work, the lack of this can cause the business to suffer tremendously.

(4 marks)

Examiner's Comments

Candidates performed fairly well on this part and were able to gain at least two marks.

In the exemplar, the candidate was able to state and explain two factors, education/knowledge in the field and possessing a business plan which will enable him to access financing for the business. Other correct responses included *ensuring that the owner is present*; *development of marketing plan/budget*; *good management practices*; *access to factors of production and location/suitability for ponds*; *good aquaculture practices*; access *to inputs* and *access to technical support*.

Candidate's Response to Part (b) (i)

(b) An agricultural cooperative has 1000 members from across four Caribbean countries and communicates regularly with these members.

(i) State ONE purpose of communication in an agricultural cooperative.

One purpose of communication is to ensure that necessary information is transferred along the board in a effective and efficient manner.

(1 mark)

Examiner's Comments

Candidates performed satisfactorily on this part.

In the exemplar, the candidate correctly stated provision of information in an efficient and effective manner. *Provision of information* was the most popular response. Other correct responses included *create awareness*, *educate* and *persuade*.

Candidate's Response to Part (b) (ii)

(ii) List THREE factors that should be considered when selecting a communication channel.

Three factors to consider when selecting a communication channel are:

- Cost
- location
- Efficiency

Examiner's Comments

This part was well done, as candidates were generally able to identify two of three factors to be considered when selecting a communication channel.

In the exemplar, the candidate correctly stated cost, location and efficiency. Other correct responses included *size of the audience*, *urgency of the response*, *level of confidentiality*, *time zone*.

Recommendations

Teachers should use case studies and scenarios to teach students

- to identify the factors that contribute to the success and failure of entrepreneurs in agricultural enterprises
- about the factors that affect the selection of communication channels.

Question 3

Candidate's Response to Part (a)

3. Farmer Amanda attended a workshop for farmers where the extension officer stated that most agricultural activities have some effect on the environment. He encouraged Farmer Amanda and the other farmers present to use appropriate technologies such as precision agriculture. This would aid in the collection of environmental data to manage their farms and to minimize any negative effects on the environment.

(a) Define the term 'precision agriculture'.

This is the ~~practi~~ process of using the correct technologies and the correct quantity of supplies to aid in maximum crop production for eg using the correct amount of fertilizer rather than guessing.

(1 mark)

Examiner's Comments

Generally, candidates demonstrated knowledge of the area tested by the question and were able to respond satisfactorily.

In the exemplar, the candidate correctly defined the term *precision agriculture*. The most popular responses included *the use of satellite technology and sensors to make agricultural decisions*.

Candidate's Response to Part (b)

(b) State TWO advantages Farmer Amanda can derive from the use of precision agriculture on her farm. You must give a reason for EACH advantage stated.

Advantage Less environmental Pollution due to less use of chemicals & fertilizers.

Reason This will allow farmers to have less contribution to the destroying of the environment as they won't be using things that affects it

Advantage Decrease in spraying levels as less chemicals & fertilizers will be used.

Reason farmers will see a increase in their ~~income~~ expenditure as they won't be buying a lot of chemicals & fertilizers ~~as~~ before.

(4 marks)

Examiner's Comments

This question required candidates to state two advantages Farmer Amanda can derive from the use of precision agriculture. Candidates were also required to provide a reason for the stated advantages. While most candidates were able to identify the advantages, they were unable to give a reason for the stated advantages.

The most popular correct responses were *reducing environmental damage* and *saving money*, as shown in the exemplar.

Candidate's Response to Part (c) (i)

(c) Farmer Amanda produces field crops. She used rainfall information provided by the meteorological office to obtain the following graph which she intends to use for decision-making in the management of her field crops.

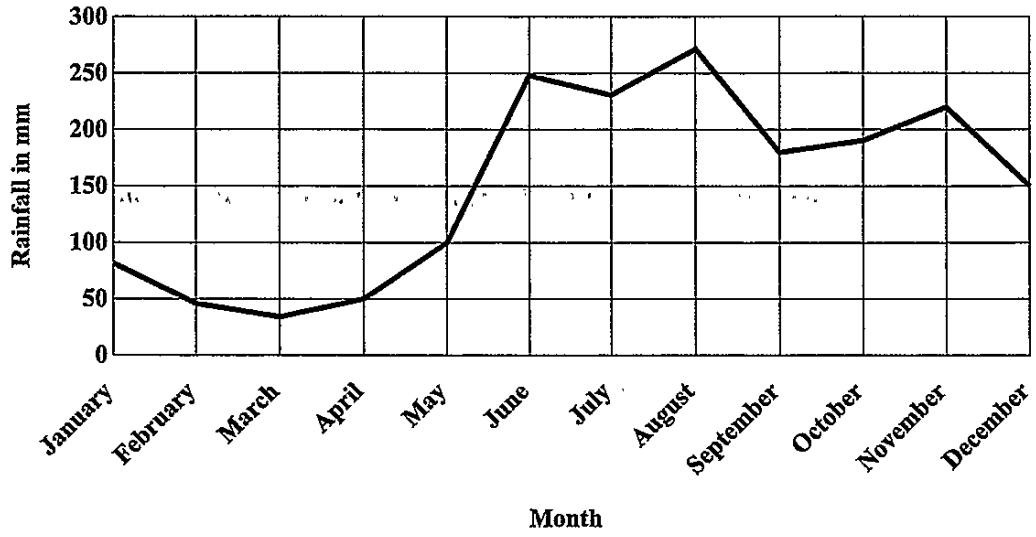


Figure 1. Diagram showing annual rainfall data provided by the meteorological office

(i) From Figure 1, which month has the least rainfall?

March has the least rainfall.

(1 mark)

Examiner's Comments

This part was very well done by candidates.

Most candidates were able to obtain the allocated mark as they identified March as the month with the least rainfall, as shown in the exemplar.

Candidate's Response to Part (c) (ii)

(ii) What is the difference in rainfall between the months of May and June?

250 − 100 = 150.

150mm is the difference

(1 mark)

Examiner's Comments

This part was also very well done as most candidates were able to correctly calculate the difference in rainfall in the months of May and June as being 150 mm.

Candidate's Response to Part (c) (iii)

(iii) Suggest TWO field crop management practices that can be employed during periods of least rainfall.

1. Implement irrigation system such as drip system.

2. Use plastic ~~mulching~~ mulch to increase water capacity of the soil.

(2 marks)

Examiner's Comments

This part was satisfactorily done by candidates, as most of them were able to suggest at least one field crop management practice that could be employed during periods of least rainfall.

In the exemplar, the candidate cited mulching and drip irrigation, which were the most popular responses given by candidates.

Candidate's Response to Part (c) (iv)

(iv) Suggest ONE way by which the collection and analysis of environmental data can be used by Farmer Amanda to improve her field crops.

She can use this data to determine what period in time the field crops need more or less fertili... manage nutrient this will lead to healthier crops, increasing her profit.

(1 mark)

Examiner's Comments

Most candidates performed well on this part, as they were able to provide one way in which the collection and analysis of environmental data could be used by Farmer Amanda to improve her field crops.

The most popular responses were *obtaining rainfall records so the farmer will know how much to irrigate or water crops*. Other popular correct responses included *knowing when to spray* and *fertilize crops*, as mentioned in the exemplar.

Recommendations

Teachers are encouraged to provide students with greater exposure to precision agriculture through videos and, where possible, field visits to farms, so that students can have first-hand experience of the use of these technologies.

Question 4

Candidate's Response to Part (a)

4. Farmer John attended a workshop on pest management hosted by the Ministry of Agriculture. Farmer John explained that his sweet potato crop is infected with the sweet potato weevil (*Cylas formicarius*) which causes damage to the crop in the field and to the tubers during storage. The extension officer advised farmers to use integrated pest management (IPM) for effective control of pests in their crops. He explained that the effective implementation of IPM programmes can be cost-effective and encourage good agricultural practices.

(a) Explain to Farmer John what is meant by the term 'integrated pest management'.

Integrated pest management (IPM) is th
incorporation of different methods of pest
and disease control such as biological,
mechanical, ~~cast~~ cultural and chemical.

(2 marks)

Examiner's Comments

Generally, candidates were able to respond satisfactorily to this part.

In the exemplar, the candidate correctly explained the term *integrated pest management*, recognizing that it is the use of a combination of different techniques/methods (cultural, biological, chemical and physical) to reduce pest populations. The most popular responses included *a combination of different methods of pest and disease control such as biological, mechanical, cultural and chemical*.

Candidate's Response to Part (b)

(b) Describe THREE major elements that must be present in Farmer John's design of an integrated pest management programme that he can use to control pests in his crops.

Major element 1 ~~observ~~ Observations – Observing the kind of pest and what may be able to rid of them.

Major element 2 type of prevention method, deciding on the ~~re~~best method to use such as biological which used living organisms, mechanical which is the farmer doing work to prevent pest and chemicals pesticides, fungicides etc.

Major element 3 a control method finding a way to control ~~EA~~ pests.

(6 marks)

Examiner's Comments

Most candidates were unable to describe the three major elements that must be present in an integrated pest management (IPM) programme, *namely observation/monitoring, prevention and intervention*.

In the exemplar, the candidate was able to identify the three major elements of the IPM but had difficulty providing a complete explanation for the third point raised. The main point that was being described by the candidate is *control*. An explanation of the control method would have been accepted as an explanation of the main point.

Candidate's Response to Part (c) (i)

(c) (i) State any ONE pest management technology farmers may use to effectively control pests.

Introduce predat Biological control ✓

.....

(1 mark)

Examiner's Comments

This part was well done by candidates. Most candidates were able to obtain the allocated mark. The most popular responses were *biological control* (as shown in the exemplar), *mechanical control* and *chemical control*.

Candidate's Response to Part (c) (ii)

(ii) Suggest how the pest management technology stated in (c) (i) can work to effectively control pests in Farmer John's crop.

It will work because the predators ✓ will prey on the weevils limiting their growth.

(1 mark)

Examiner's Comments

Most candidates performed well on this part, as they were able to suggest how the pest management technology identified in Part (c) (i) could work to effectively control pests in Farmer John's crop.

The exemplar shows that the candidate, having identified biological control as the answer for Part (c) (i), suggested that biological control would work effectively seeing that the predators will prey on the weevils thus limiting their growth.

Recommendations

Teachers are encouraged to conduct crop investigations for the Double Award syllabus and to ensure that pest and disease management are covered by students. Ongoing engagement in these practical activities will allow students to develop mastery in practical skills, to acquire greater theoretical understanding of the syllabus content and to apply their theoretical understanding to real-life farming situations. Field trips are also encouraged so students can gain additional exposure to pest management systems used for different crops and cropping systems.

Question 5

Candidate's Response to Part (a) (i)

5. (a) Farmer Tim is interested in rearing rabbits for meat production and attended a rabbit production training organized by the Ministry of Agriculture. The extension officer stated that snuffles is a major disease affecting rabbits in the area.

(i) Identify the causative agent of snuffles.

Virus ~~, lack~~ also bacteria

Examiner's Comments

Generally, candidates struggled to identify the causative agent of snuffles in rabbits but understood the reasons for the disease's persistence and/or survival. Correct responses included bacteria or bacterium. Incorrect responses included 'lack of proper sanitation', 'food contamination' and 'virus'.

Candidate's Response to Part (a) (ii)

(ii) State TWO symptoms of snuffles in rabbits.

- Sneezing
- Low energy rate

Examiner's Comments

Generally, candidates were able to identify at least one symptom of the disease, scoring at least one mark on the question. Correct responses included *weakness*, *runny nose*, *nasal discharge of mucus*, *not breathing properly*, stuffy nose and *tiredness*. Incorrect responses included 'blood coming out with faeces', 'runny faeces', 'diarrhoea', 'loss of fur/hair' and 'shivering'.

Candidate's Response to Part (a) (iii)

(iii) Suggest TWO good agricultural practices that Farmer Tim can adopt on his farm to prevent any outbreak of snuffles. You must give ONE reason for EACH practice suggested.

Agricultural practice ~~Have a~~ Implent hygiene practices

Reason Implementation of proper hygiene practices could prevent the spread of bacteria and virus that cause diseases in the farm.

Agricultural practice Sanitized Sterlize tools that are used on the farm.

Reason Cleaning of tools can result in the killing of bacteria and fungi before it spreads and infect animals.

Examiner's Comments

Generally, candidates answered this part well. However, in many instances, candidates were able to correctly name the good agricultural practice but were unable to provide correct reasons for the practice.
Correct responses included the following.

- Isolation/quarantine animal — prevents the rabbits from infecting the other rabbits with the disease/contains disease, special care and treatment/minimizes the risk of other animals getting infected, gives the other rabbits a better chance of surviving.
- Vaccines — make the rabbits resistant even if they still get the disease, builds immune system/can fight off the disease.
- Use appropriate antibiotics at the correct dosage — antibiotics kill the snuffles bacteria in the rabbits' body and help the rabbits to recover.

Examiner's Comments continued

- Sanitize/clean tools — kills bacteria before the rabbits infect other animals/prevents the transfer of pathogens from outside.
- Implement good hygiene practices on the farm — prevent the spread of disease.
- Make sure the rabbits are not cramped — the infection will not spread as fast.
- Proper sanitation of the hutches/rabbitry — will remove any trace of the causative agent.

Incorrect responses included the following.

- Good sanitation — keeps the rabbit in good condition.
- Use a pest control — controls/kills pest in the area.
- Vaccines — prevent the rabbits from getting worse/dying.

Candidate's Response to Part (b) (i)

(b) On a recent field trip to the Government Goat Breeding Unit, Farmer Zoe observed that there were many flies on the navel cord area of one of the newborn kids. Her friend, Farmer Mark, told her that the navel cord area was not treated against flies.

(i) State TWO reasons for treating the navel cord area against flies.

o Prevent it from getting infected and affecting the kid.

o It eliminate the spread and development of diseases/infections that may occur from that area if not properly cared for.

(2 marks)

Examiner's Comments

Generally, candidates responded well, scoring at least one mark. Correct responses included the following.

- Flies are harmful pests that suck on embryonic fluid on the animal's skin.
- Prevent flies from laying eggs; fly eggs will hatch into larvae that will irritate the kid; larvae eat the kid's tender flesh.

Examiner's Comments continued

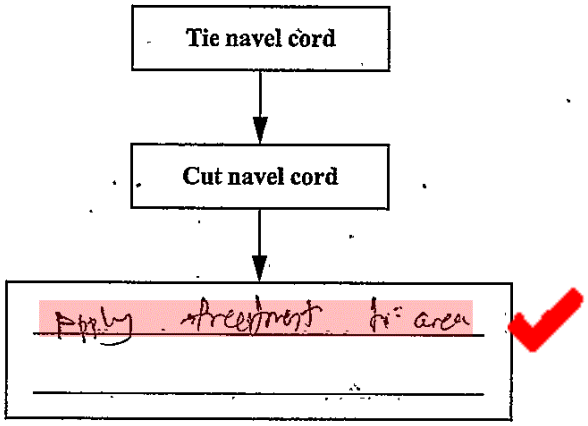
- Protect it from the deadly diseases flies carry; prevent spread of disease on the navel cord; area will become infected; prevents area from healing; prevent infection; to prevent sores.
- Helps the navel to heal faster; navel cord does not become a breeding ground for flies; easy for the fly to penetrate the navel; flies will not bother/irritate the newborn.

Incorrect responses included the following.

- The kid/newborn will get sick; prevent illness; so the flies will not affect the newborn kids; prevent goats from getting injured.

Candidate's Response to Part (b) (ii)

(ii) The following are the steps farmers are required to follow when treating a kid's navel against flies. Complete the diagram by filling in the missing step.



(1 mark)

Examiner's Comments

Generally, this part was well answered, with candidates earning the allocated mark. Correct responses included the following.

- Spray the navel cord.
- Apply treatment to cord, sanitize/disinfect area after cutting, soak with iodine.
- Apply antibiotics.

Incorrect responses included the following.

- Remove the navel cord and properly dispose of it.
- Spray insecticide.
- Clip and leave the navel cord until it is fully healed.

Recommendations

The syllabus requires that candidates rear rabbits. In addition, as part of their practical work and SBAs, candidates are required to attend to young animals by treating the navel against flies. Ongoing engagement in these practical activities will allow for the development of mastery in practical skills, greater theoretical understanding of the syllabus content and the application of theoretical understanding to real-life farming situations. Also, more field trips to visit farmers' operations are encouraged. In addition, emphasis must also be placed on the correct spelling of agricultural terms.

Question 6

Candidate's Response to Part (a) (i)

6. (a) Farmer Inshan was operating his tractor and as he shifted gears, he heard a grinding noise. The mechanic told him that the tractor's transmission system required repairs.

(i) Define the term 'transmission system'.

~~In A trasmission system refers to~~ belt and gears mechanisms that work with other parts ~~tractor to~~ of a machine's ~~to run and~~ engine to move while the engine is running.

(1 mark)

Examiner's Comments

Generally, this part was very poorly done. While many candidates recognized that the transmission system comprised of gears, they failed to link this to the transfer of power from the engine to other working parts of the tractor. Candidates were not aware of the functions of the transmission in a vehicle.

Some correct responses included the following.

- System which gets power from the engine to the wheel to make it move
- The belt and gears mechanism that works with other parts of the machine to move it while the engine is running
- Part of the machine where power is transferred to the wheels via gears

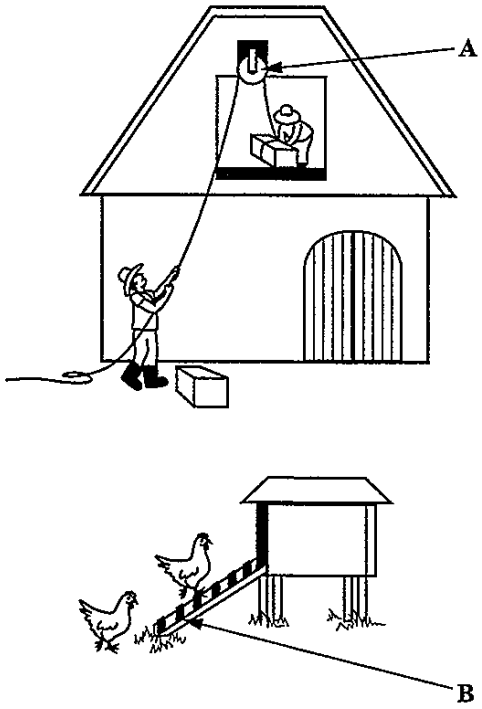
Some incorrect responses included the following.

- The part of the machine that controls the movement of the machine
- The area the engine gets its power from to move
- System which allows movement of the machine

Candidate's Response to Part (a) (ii)

(ii) At a recent agricultural exhibition, there was a demonstration on the use of simple tools in animal production. Figure 2 illustrates the demonstration that was used at the exhibition.

State the names of the simple machines seen at Parts A and B.



A ..... Pulley ✓ .....

B ..... Inclined Plane ✓ .....

(2 marks)

Examiner's Comments

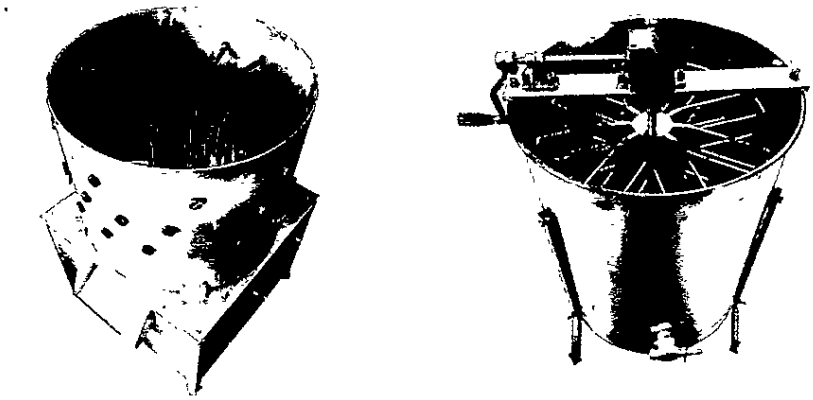
This question was generally well answered. Candidates correctly identified at least one of the simple machines; however, some candidates misinterpreted the incline plane for a ladder.

The correct responses are as follows.
A — pulley
B — inclined plane/ramp

Incorrect responses included the following.
A — lever/puller/wheel
B — stairs/ladder

Candidate's Response to Part (b) (i)

(b) Farmer Debbie is a small-scale poultry farmer and wants to expand her operations to include a poultry processing facility on her farm. The extension officer visited her farm and recommended that she should not remove the poultry feathers manually.



X Y

Figure 3. Machines X and Y, used on poultry farms

(i) State which of the machines above, X or Y, can be used to remove the poultry feathers. You must give ONE reason for your answer.

Machine ...X...

Reason ...Machine X is a defeathering machine ~~it the name suggests, it a peice of equipment that decrease the need for labour required to defeather broilers manually. The~~ in which the broiler is rotated and ~~the prenges in~~ the skin is beat against the internal prongs, thus loosening the skin allowing the feather to come more easily. (2 marks)

Examiner's Comments

This part was generally well answered. Candidates correctly identified the plucking machine and explained the criteria used for identifying same. However, many candidates' responses simply restated the stem of the question, with candidates being unable to describe the function of the machine.

Examiner's Comments continued

The correct response is as follows.

Machine X — plucking machine

Reasons

- It has sticky rubber pillars that remove the feathers quickly.
- There are pluckers/fingers present in the machine to grip and remove feathers.

Incorrect responses included the following.

Machine Y

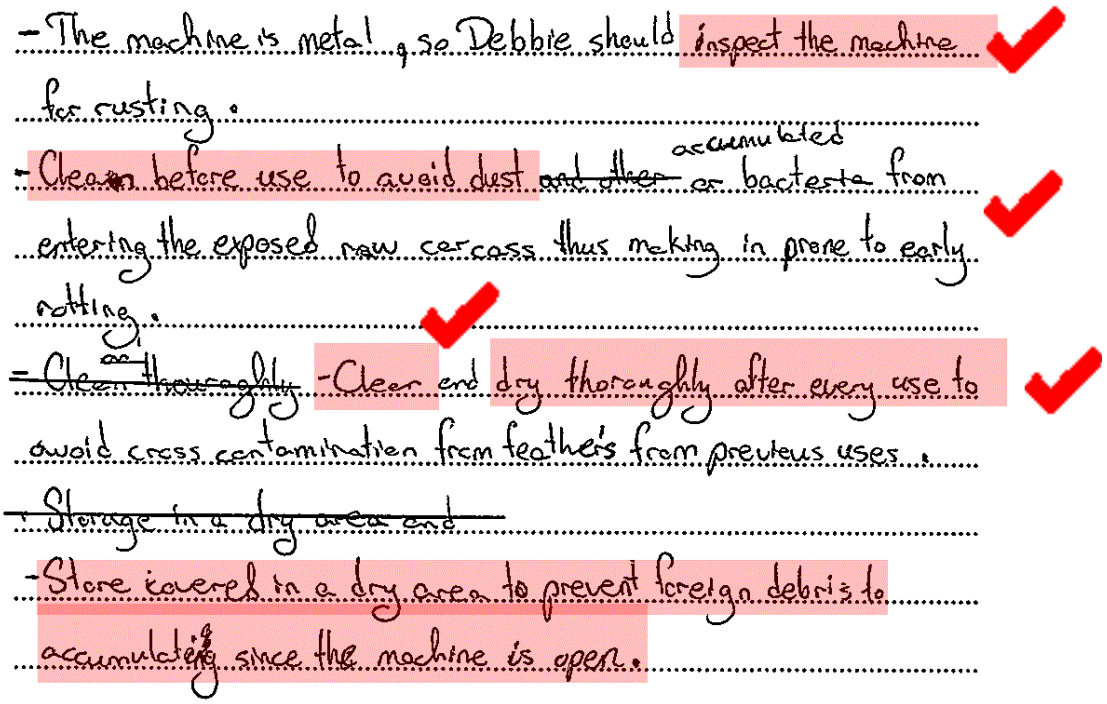
Reasons

- It is built with a mechanism to remove the feathers.
- It heats the water to boil the chicken and it rotates to remove the feathers.

Candidate's Response to Part (b) (ii)

(ii) Recently, customers who purchased dressed poultry from Farmer Debbie started complaining about the quality of carcasses she was selling. Further investigations revealed that the machine used to remove the poultry feathers was not being properly maintained, resulting in damage to the carcasses.

Suggest FOUR steps Farmer Debbie should take to care for and maintain this machine in order to ensure that the dressed poultry being sold are of good quality.



Examiner's Comments

Generally, this part was well answered. Candidates were able to outline steps required in the maintenance of the plucking machine. Candidates who erred described steps taken in defeathering of the bird.

Popular correct responses included the following.

- Wash and disinfect the machine before and after use.
- Remove all of the feathers that are stuck in the machine.
- Store plucking machine in a secure, dry place.
- Do not put too many birds in at a time.

Incorrect responses included the following.

- Place the bird in the machine carefully.
- Check the bird after plucking to make sure it does not have anything unwanted on it.
- Clean the inside of the chicken.

Candidate's Response to Part (b) (iii)

(iii) At a training session for new small-scale poultry processors, participants were advised that all workers should wear appropriate personal protective equipment (PPE). Participants were also advised to ensure that operators using machines for removing poultry feathers should **not** wear shirts with long, loose sleeves.

Suggest ONE reason to support this advice.

Operators using the machines should not wear such clothing as to prevent major injures due to sleeves getting trapped in the machine if accidental turned out

(1 mark)

Examiner's Comments

This section was well answered by candidates, who demonstrated awareness of safety practices when using a plucking machine.

Some correct responses included the following.

- Long sleeves can get caught in the machine.
- Long sleeves may become trapped in the moving parts.
- Prevent injuries if sleeve gets trapped in the machine.

Some incorrect responses included the following.

- To prevent contamination of the bird.
- To prevent damage to the machine.

Recommendations

The broiler SBA requires students to rear birds for slaughter. Teachers should complete this SBA practical by using a plucking machine to slaughter broiler birds. This will demonstrate to students how to correctly use a plucking machine safely. Also, more field trips to visit farmers' operations are encouraged. Ongoing engagement in these practical activities will allow for the development of mastery in practical skills, greater theoretical understanding of the syllabus content and the application of theoretical understanding to real-life farming situations. In addition, emphasis must also be placed on the correct spelling of agricultural terms.