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MAY/JUNE 2025

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

AGRICULTURAL SCIENCE
(Single Award)

Paper 02 – General Proficiency

2 hours

331

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of SIX questions in three sections. Answer ALL questions.
2. Write your answers in the spaces provided in this booklet.
3. Do NOT write in the margins.
4. You may use a silent, non-programmable calculator.
5. If you need to rewrite any answer and there is not enough space to do so on the original page, you must use the extra lined page(s) provided at the back of this booklet. **Remember to draw a line through your original answer.**
6. **If you use the extra page(s), you MUST write the question number clearly in the box provided at the top of the extra page(s) and, where relevant, include the question part beside the answer.**

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SECTION I

Answer ALL questions in this section.

Write your answers in the spaces provided in this booklet.

1. (a) Lilian recently graduated from high school and lives at home with her parents. She has just completed an agricultural training course and wants to start a mixed farming enterprise. Lilian's friend advises her that she will need capital to start her farm and suggests that she try to obtain a loan from the Agricultural Credit Bank. Lilian is not sure if she will qualify for a loan from the bank for her mixed farm enterprise.

(i) List THREE documents that Lilian needs to provide to the Agricultural Credit Bank when she is applying for the loan.

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(3 marks)

(ii) Lilian provided all the required documents to the bank but the loan was not approved. Suggest TWO reasons why the bank may not have approved Lilian's loan.

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(2 marks)

(iii) State TWO other sources of funding that Lilian can consider, in order to obtain capital for her farm enterprise.

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(2 marks)

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(b) Country A has a large number of farmers who produce fruits and vegetables for the population. The Ministry of Agriculture has just announced that it will allow the importation of agricultural produce all year-round.

(i) Suggest TWO reasons why the Ministry of Agriculture decided to allow the importation of agricultural produce all year-round.

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(2 marks)

(ii) State ONE challenge of promoting imported foods as opposed to locally produced foods.

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(1 mark)

Total 10 marks

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2. **(a)** **(i)** State ONE way in which a budget can be used for decision-making.

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(1 mark)

(ii) Differentiate between a 'partial budget' and a 'complete budget'.

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(2 marks)

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(b) Farmer Rajack operates a vegetable farm. He wants to know whether he should expand his operations. His accountant has prepared a budget for a three-year period to allow Farmer Rajack to make a decision.

TABLE 1: THREE-YEAR BUDGET

Item	Year 1	Year 2	Year 3
Sales	$10 000	$12 000	$14 000
Variable costs	$4 000	$ 8 000	$12 000
Gross margin	**$6 000**	**$4 000**	**$2 000**
Fixed costs	$4 000	$4 000	$4 000
Net profit	**$2 000**	**$0**	**– $2 000**

(i) Using the information in Table 1, describe ONE challenge that Farmer Rajack could face if he decides to expand the farm.

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(2 marks)

(ii) State TWO possible solutions for addressing the challenge identified in (b) (i).

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(2 marks)

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(c) The Minister of Agriculture is concerned about the impact of climate change on farmers in the country. She wants to promote hydroponics among farmers for the cultivation of vegetables throughout the year.

Suggest THREE incentives that could be provided to farmers to encourage them to utilize hydroponics in their farm enterprises.

Incentive 1 .....

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Incentive 2 .....

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Incentive 3 .....

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(3 marks)

Total 10 marks

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SECTION II

Answer ALL questions in this section.

Write your answers in the spaces provided in this booklet.

3. Farmer Joy is a vegetable farmer who recently started cultivating string beans during the rainy season. She observed that her yields were low and that the bean plot was overrun with pests and diseases.

The agricultural extension officer visited Joy's farm and observed the pests shown in Figure 1 and Figure 2 among her bean crop.

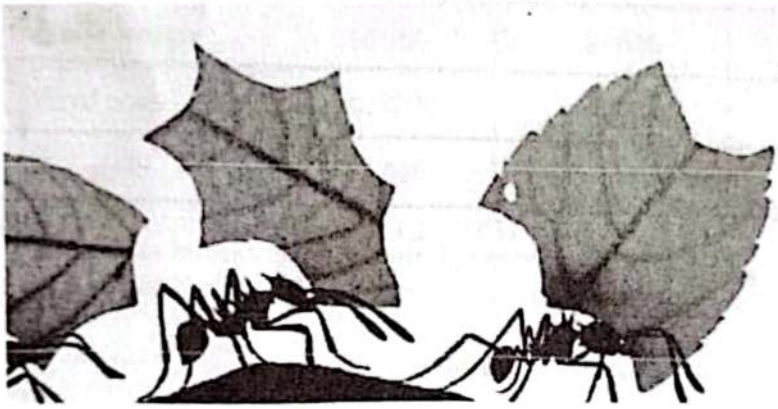


Figure 1

Source: https://imengine.public.prod.dur.navigacloud.com/?uuid=02B9DE8E-9DF1-41FA-AB12-A768736533F5&function=original&type=preview

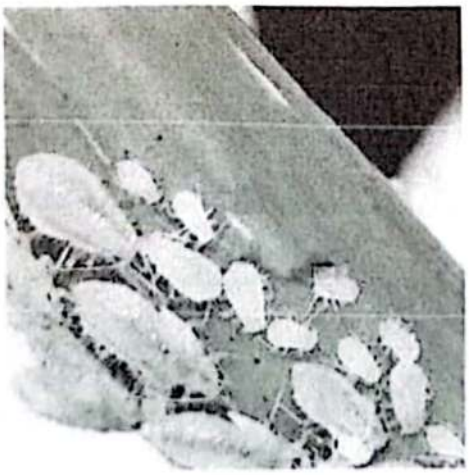


Figure 2

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(a) (i) Identify the pests shown in Figure 1 and Figure 2 **on page 10**.

Figure 1 .....

Figure 2 .....

(2 marks)

(ii) The pests in Figure 1 and Figure 2 **on page 10** are classified based on how they feed on the plant. Name the group that the pest in Figure 1 belongs to.

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(1 mark)

(b) (i) The agricultural extension officer also told Joy that her bean plants were infected with powdery mildew. Other than a decrease in yield, state ONE symptom of powdery mildew in string beans.

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(1 mark)

(ii) Suggest TWO ways in which powdery mildew spores can be transmitted or spread throughout Farmer Joy's vegetable farm.

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(2 marks)

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(iii) Outline TWO cultural methods that Farmer Joy can use to control powdery mildew in her bean crop. You MUST provide **one** reason for the use of EACH method.

Method .....

Reason .....

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Method .....

Reason .....

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(4 marks)

Total 10 marks

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4. (a) On a recent field trip to the Mountain View Watershed Training Centre, the forester stated that hilly areas are more prone to soil erosion than flatter areas. He also explained that soil erosion can be controlled with good soil and water management practices.

(i) Define the term 'soil erosion'.

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(1 mark)

(ii) Name TWO agents of soil erosion in the Caribbean.

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(2 marks)

(b) (i) Outline ONE effect of soil erosion on crop production.

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(2 marks)

(ii) Explain ONE cause of soil erosion in hillside areas.

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(2 marks)

(c) State THREE soil management practices which can be used to prevent soil erosion in hilly areas.

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(3 marks)

Total 10 marks

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SECTION III

Answer ALL questions in this section.

Write your answers in the spaces provided in this booklet.

5. (a) Farmer Jason inherited a parcel of land which he intends to use to establish a freshwater fish farm to produce fish for the local market. He plans to dig earthen ponds to rear his fish. At a workshop on freshwater fish production, the agricultural extension officer advised Farmer Jason that there are a number of factors to be considered in the establishment and management of a freshwater fish farm in the Caribbean. The agricultural extension officer stated that one of the main factors to consider in the establishment of the freshwater fish farm is the type of fish to be reared.

(i) Identify TWO freshwater fish species that can be reared on Farmer Jason's fish farm.

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(2 marks)

(ii) Suggest ONE method Farmer Jason could use to harvest fish from his farm.

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(1 mark)

(iii) Outline TWO factors Farmer Jason must consider when selecting a site for establishing his fish farm. You MUST provide one reason for considering EACH factor.

Factor .....

Reason .....

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Factor .....

Reason .....

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(4 marks)

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(b) Farmer Jason has established his fish farm and observes that his initial yields are low.

(i) State ONE reason that can contribute to Farmer Jason having a poor fish yield.

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(1 mark)

(ii) Suggest ONE management practice that is necessary for maximizing fish yields on Farmer Jason's farm. You MUST provide **one** reason for your suggested management practice.

Management practice .....

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Reason .....

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(2 marks)

Total 10 marks

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6. (a) Johnny has implemented a breeding programme to increase the number of rabbits on his farm. He mates the male and female rabbits as shown in Figure 3 below.

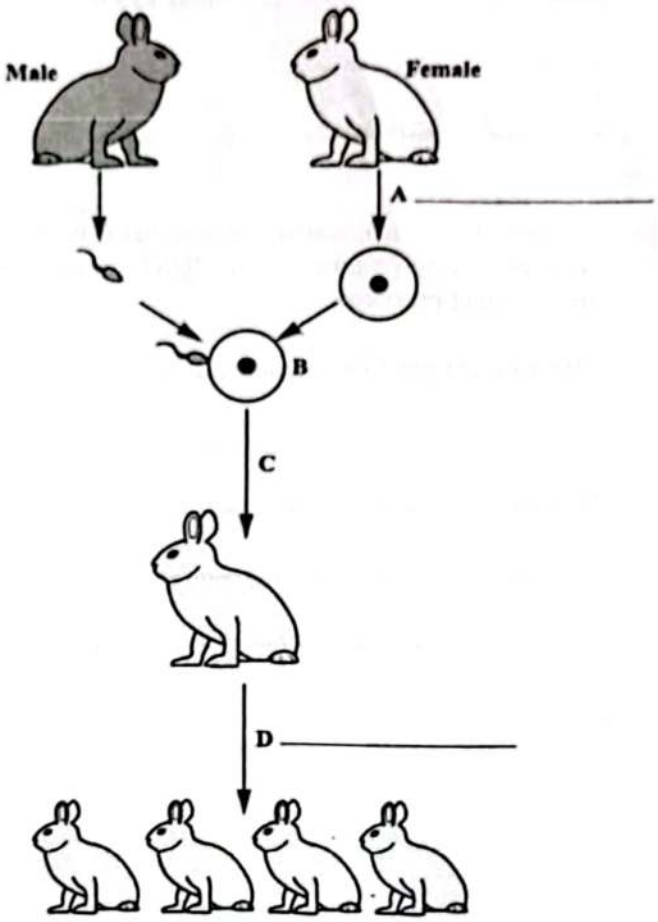


Figure 3. Reproductive process in rabbits

(i) On the diagram in Figure 3, label the reproductive process shown at A and D. **(2 marks)**

(ii) Outline the difference between the reproductive processes labelled B and C.

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(2 marks)

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(iii) State the average length of time it takes for the female rabbit to move from B to D.

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(1 mark)

(b) Farmer Janice was concerned about the poor level of fertility among her breeding herd, which has negatively impacted her farm income. She attended a livestock workshop hosted by the Ministry of Agriculture. The agricultural extension officer advised that farmers need to consider oestrus synchronization as one management practice that can increase the level of fertility of their animals and the profitability of their livestock enterprise.

(i) List FOUR benefits that farmers can derive from the use of oestrus synchronization in the management of their livestock herd.

1. .....

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2. .....

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3. .....

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4. .....

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(4 marks)

(ii) Suggest the time in the reproductive process that would be best for scheduling oestrus synchronization for Farmer Janice's female livestock.

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(1 mark)

Total 10 marks

END OF TEST

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST.

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