FORM TP 2021048

TEST CODE **01203020**

MAY/JUNE 2021

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

AGRICULTURAL SCIENCE
(Single Award)

Paper 02 – General Proficiency

2 hours

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.**

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

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SECTION I

Answer ALL questions.

1. (a) (i) Explain the difference between 'fixed cost' and 'variable cost'.

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(2 marks)

(ii) Define the term 'partial budget'.

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(1 mark)

(b) Farmer Khalil operates a two-acre vegetable farm. He wants to expand his farm to five acres but is not sure if he should operate a mixed farm, or grow only vegetables. Table 1 shows the budget information for a mixed farm and a vegetable farm, which Farmer Khalil needs to consider in order to make a decision.

TABLE 1: BUDGET FOR A MIXED FARM AND A VEGETABLE FARM

Option A: Mixed Farm		**Option B: Vegetable Farm**	
	$		$
Income	9 000	Income	15 000
Variable costs	6 000	Variable costs	12 000
Gross margin	**3 000**	**Gross margin**	**3 000**
Fixed costs	500	Fixed costs	4 000
Net profit	**2 500**	**Net profit**	**(1 000)**

(i) a) Based on the information presented in Table 1, which of the options, a mixed farm or a vegetable farm, should Farmer Khalil operate?

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(1 mark)

b) Using evidence from the table, explain TWO reasons for your choice in a). Your explanation **must** compare one option with the other.

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(4 marks)

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(ii) Suggest ONE reason why EACH of the following is important for a farmer to consider when making decisions.

Gross margin .....

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Net profit .....

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(2 marks)

Total 10 marks

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2. (a) (i) Define the term 'trade agreement'.

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(2 marks)

(ii) CARICOM has a number of trade agreements with other countries. Give an example of ONE such trade agreement.

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(1 mark)

(iii) Jaya is a major producer of agricultural products. She has been trying to export to the United Territories without success. The Ministry of Agriculture has just advised her that her country has signed a trade agreement with the United Territories.

Suggest THREE advantages of this trade agreement to Jaya's business.

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(3 marks)

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(b) Henry is an egg farmer. He sells eggs to a supermarket in a nearby city. The purchasing manager at the supermarket recently complained that Henry's eggs are being returned by customers. The eggs are sometimes cracked and the trays have many different-sized eggs. The purchasing manager has given Henry two weeks to improve on the quality of eggs that are delivered to the supermarket.

Outline TWO measures that Henry should take to improve the quality of eggs sold to the supermarket.

Measure .....

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Explanation .....

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Measure .....

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Explanation .....

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(4 marks)

Total 10 marks

SECTION II

Answer ALL questions.

3. Farmer Mary grows tomatoes for the local market. She observes that her yield is low. The extension officer visits her field and indicates that the tomato plants are affected by powdery mildew.

(a) Other than a decrease in yield, state TWO symptoms of powdery mildew in tomatoes.

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(2 marks)

(b) State the name of the causative agent of powdery mildew.

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(1 mark)

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(c) Explain THREE methods that Farmer Mary can use to control the powdery mildew in her tomato crop.

Method .....

Explanation .....

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Method .....

Explanation .....

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Method .....

Explanation .....

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(6 marks)

(d) Suggest ONE way in which powdery mildew can spread or be transmitted throughout Farmer Mary's tomato field.

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(1 mark)

Total 10 marks

4. Farmer Gerona recently cleared ten hectares of flat land and plans to produce a crop of beans. She wants to carry out only primary tillage on her field. However, her friend, Farmer George, tells her that she also needs to do secondary tillage.

(a) State THREE advantages of primary tillage.

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(3 marks)

(b) Suggest THREE reasons why Farmer Gerona must also do secondary tillage before planting.

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(3 marks)

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(c) Farmer Gerona attaches a seeder/planter to her tractor which she uses to sow the bean seeds directly into the ground.

Suggest FOUR benefits Farmer Gerona would derive from the use of this mechanical seeder/planter for planting her crop.

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(4 marks)

Total 10 marks

SECTION III

Answer ALL questions.

5. On a recent field trip to Livestock Feed Mill, students were told that the feed mill produces 'production ration' for many classes of animals.

(a) Define the term 'production ration'.

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(2 marks)

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(b) Farmer Andy received two different bags of poultry feed from Livestock Feed Mill with labels showing the constituents of the feed, as presented in Table 2.

TABLE 2: CONSTITUENTS OF TWO TYPES OF POULTRY FEED

Constituent	Feed A (%)	Feed B (%)
Crude protein	20.0	23.0
Crude fat	2.5	4.0
Crude fibre	3.0	3.0
Minerals	1.3	1.6

Which of the two types of feed is BETTER suited for broiler birds at four to six weeks of age? Give TWO reasons for your answer.

Feed .....

Reasons .....

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(3 marks)

(c) Farmer Sunita rears layer birds for table eggs. She uses the equipment shown in Figure 1 to prepare her eggs for the market.

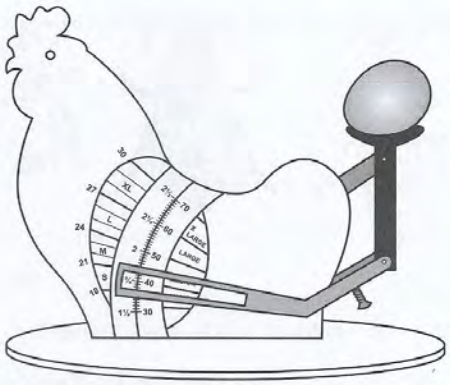


Figure 1. Equipment used in preparing eggs for the market

(i) State the name of the equipment shown in Figure 1.

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(1 mark)

(ii) Explain why this equipment is necessary when preparing table eggs for the market.

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(2 marks)

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(iii) Farmer Sunita observed one of her workers washing the eggs instead of wiping them with a damp cloth.

Suggest TWO reasons why eggs should not be washed.

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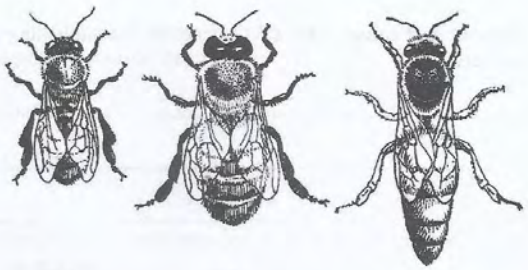
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(2 marks)

Total 10 marks

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6. (a) Figure 2 shows the types of bees found in a hive.



X Y Z

Figure 2. Types of bees found in a hive

(i) Identify the bees labelled X and Z.

X .....

Z .....

(2 marks)

(ii) What is the function of the bee labelled Y?

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(1 mark)

(b) Farmer Asha wants to improve the yield of fruits in her citrus orchard. The extension officer advises her to establish an apiary in the orchard.

(i) Suggest to Farmer Asha TWO benefits of establishing an apiary in her citrus orchard.

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(2 marks)

(ii) Farmer Asha realizes that beekeeping is a profitable business and wants to increase the size of her apiary. She decides to establish additional hives next to a vegetable farm. However, she observes that the yield of honey from the hives next to the vegetable farm is lower than that of the hives located in the orchard.

Suggest TWO reasons why the yield of honey in the hives located close to the vegetable farm is lower than that of those located in the orchard.

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(2 marks)

(c) While inspecting one of her hives, Farmer Asha observes that many of the sealed cells in the combs of the brood box are dark brown and produce a foul smell.

(i) Identify the disease from which the bees are MOST likely suffering and state the agent that causes the disease.

Disease .....

Agent .....

(2 marks)

(ii) Suggest ONE management practice that Farmer Asha can implement to control this disease.

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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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