FORM TP 2021046

TEST CODE **01202030**

MAY/JUNE 2021

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

AGRICULTURAL SCIENCE (Double Award)

Paper 03 – 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: Entrepreneurship and Communication

Answer ALL questions.

1. (a) State ONE difference between a 'cash flow statement' and a 'profit and loss account'.

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(2 marks)

(b) Ruth has been experiencing financial difficulties in her farm enterprise. The accountant has completed the balance sheet for the farm enterprise. Table 1 shows the current assets and current liabilities sections of the balance sheet.

TABLE 1: BALANCE SHEET AS AT 1 MAY 2020 (EXCERPT)

	$		$
Current Assets		**Current Liabilities**	
Cash in hand	5 000		
Accounts receivable (3 months and over)	6 000	Accounts payable	20 000
Total Current Assets	11 000	**Total Current Liabilities**	20 000

From the balance sheet above, identify ONE area of financial concern for Ruth and suggest ONE solution to the concern identified.

Concern .....

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Solution .....

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(2 marks)

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(c) Malik is the owner of Augusta Poultry Farms. He employs 100 workers, who are in four different locations across the country. Malik communicates with all his staff through monthly meetings at each of the four locations. He discusses issues relating to the production, sales, management and finances of the farms. His workers recently complained that it takes too long for him to respond to the issues affecting the farms, some of which require urgent attention. Malik has hired you to assist him in addressing his communication problem.

(i) Advise Malik of TWO advantages and TWO disadvantages of using monthly meetings as the only communication tool with his workers.

Advantages .....

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Disadvantages .....

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(4 marks)

(ii) State TWO electronic communication tools that Malik can use to better interact with all his workers at once and more frequently.

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(2 marks)

Total 10 marks

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2. (a) Vickram operates a profitable two-hectare livestock farm. He rears mainly sheep and goats on lands that he bought five years ago. Vickram sells his meat to supermarkets, middlemen and schools. Recently, there has been frequent theft of the animals on the farm. This has caused major financial losses to Vickram. He is concerned that his farm is not physically secured and is in a remote location.

The police informs Vickram that they do not have enough officers to patrol the farming area. Vickram then meets with other farmers in the community and they have agreed to form a community watch group. The Ministry of Agriculture has recently purchased drones to assist the police with surveillance in Vickram's community.

Using the case study above, complete a SWOT analysis for Vickram's farm.

(i) Identify TWO 'strengths' of Vickram's farm.

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(2 marks)

(ii) Identify TWO 'weaknesses' of Vickram's farm.

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(2 marks)

(iii) Identify ONE 'opportunity' to address the challenges faced at Vickram's farm.

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(1 mark)

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(iv) Identify ONE 'threat' to Vickram's farm.

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(1 mark)

(b) Farmer Stacy wants to sell fresh produce to an importer in another country. She is not sure what communication channel(s) should be used to contact the importer.

(i) Suggest TWO factors that would determine the selection of the communication channel used by Farmer Stacy to contact the importer.

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(2 marks)

(ii) State TWO barriers to communication that Farmer Stacy may experience in contacting the importer.

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(2 marks)

Total 10 marks

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SECTION II: Crop Management Technologies

Answer ALL questions.

3. (a) Figure 1 shows a common pest of sweet potatoes.



Figure 1. Common sweet potato pest

(i) Identify the pest shown in Figure 1.

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(1 mark)

(ii) Suggest ONE method of controlling the pest shown in Figure 1.

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(1 mark)

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(b) Farmer Mark produces sweet potatoes on his two-hectare farm, which he sells directly to a nearby hotel. The hotel complained that the last batch of sweet potato tubers were smaller than usual and that some were damaged.

Suggest ONE reason **each** why the sweet potato tubers were smaller than usual and damaged.

Smaller tubers .....

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Damaged tubers .....

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(2 marks)

(c) State TWO signs of maturity and readiness for the harvesting of sweet potatoes.

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(2 marks)

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(d) Recommend FOUR practices that Farmer Mark can employ to prevent damage to the sweet potato tubers during harvesting in the future.

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(4 marks)

Total 10 marks

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4. Farmer Gordon produces vegetable crops on his farm, which is irrigated using rainfall. Over the last three years he has observed that during the dry season crop yield is extremely low. He is advised by the extension officer that in order to increase the profitability of his farm, he must conserve environmental resources through climate-smart agriculture.

(a) List the THREE components of climate-smart agriculture.

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(3 marks)

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(b) Explain TWO examples of soil nutrient management strategies that Farmer Gordon can use in producing his crops, while conserving environmental resources.

Strategy .....

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Explanation .....

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Strategy .....

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Explanation .....

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(4 marks)

(c) Advise Farmer Gordon on THREE climate-smart water conservation strategies he can use in the production of his crops to lower the risk of crop water stress and yield reduction.

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(3 marks)

Total 10 marks

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SECTION III: Animal Management Technologies

Answer ALL questions.

5. On a recent field trip to Progressive Pig Farm, students saw rats feeding on the pig ration in the storeroom.

(a) (i) State ONE effect of rats on pig production.

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(1 mark)

(ii) State TWO mechanical methods of controlling rats on the farm.

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(2 marks)

(iii) The farm manager explained that the business was considering using biological methods to control the rats on the farm. State ONE reason why biological pest control is considered a good agricultural practice.

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(1 mark)

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(b) Farmer Deen is a dairy goat farmer. He observes when trying to milk one of his animals that the udder is hard, swollen, tender, and that the milk is watery with clots. The veterinarian visits his farm and diagnoses the animal as having mastitis.

Explain THREE management practices Farmer Deen can adopt to treat this animal.

Management practice .....

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Explanation .....

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Management practice .....

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Explanation .....

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Management practice .....

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Explanation .....

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(6 marks)

Total 10 marks

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6. (a) Farmer Asha is a large-scale pig farmer. She also slaughters and sells meat to supermarkets across the country. The extension officer advises her that she should expand her operations by making value-added products from the animal by-products and animal waste.

(i) Identify TWO animal by-products that Farmer Asha can obtain from her animals to make value-added products.

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(2 marks)

(ii) State ONE value-added product that can be made from the animal by-products.

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(1 mark)

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(b) Farmer Asha is considering using the animal waste from her farm to make biogas. She attends a training workshop at the Ministry of Agriculture and is given a diagram outlining the steps she must follow in biogas production. Figure 2 shows an incomplete diagram of the steps to be followed.

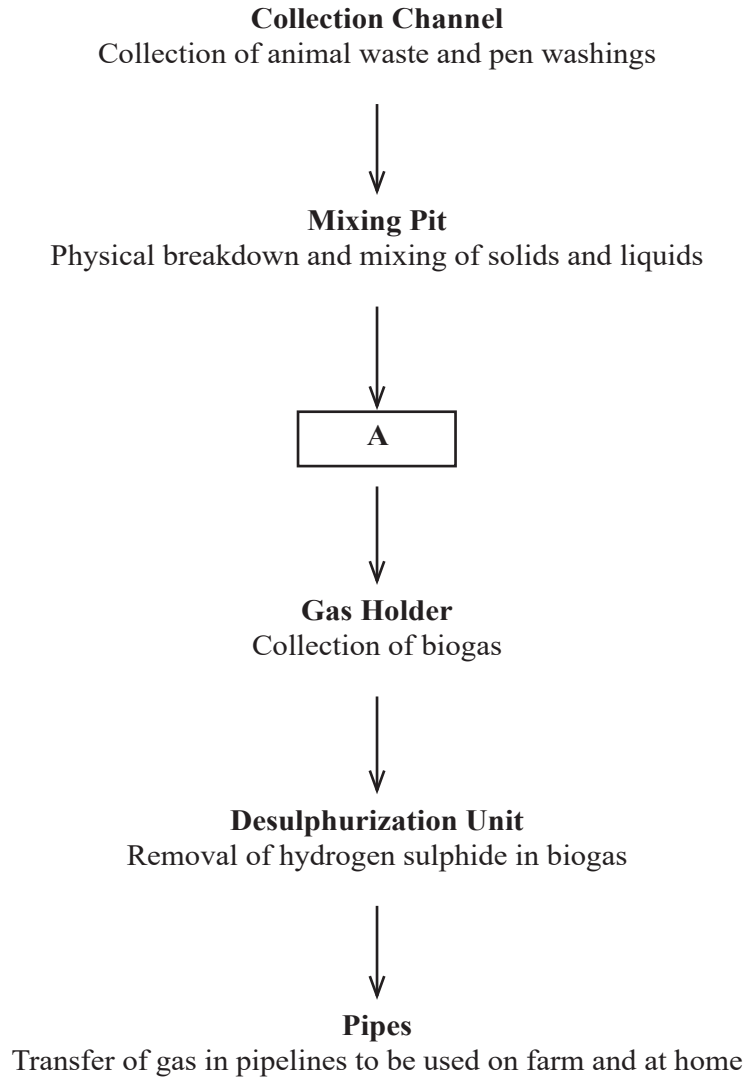


Figure 2. Biogas production flow chart

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(i) Identify the missing step labelled A in the flow chart **on page 16**.

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(1 mark)

(ii) Describe the process that takes place at the step labelled A.

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(1 mark)

(iii) Suggest ONE reason for the desulphurization of biogas.

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(1 mark)

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(c) Farmer Rose inherited a sheep farm from her uncle. She observes that the animals are reared intensively. The pens are hot and humid, and the animals usually stand in a thick layer of droppings. Farmer Rose wants to redesign the building to ensure that the animals are comfortable.

Advise Farmer Rose on the type of material she should use for the roof and floor of the sheep pens and give ONE reason for **each** recommendation.

Suggested roof material .....

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Reason .....

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Suggested floor material .....

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Reason .....

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(4 marks)

Total 10 marks

END OF TEST

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

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