FORM TP 2011043

TEST CODE 01203020

MAY/JUNE 2011

CARIBBEAN EXAMINATIONS COUNCIL

SECONDARY EDUCATION CERTIFICATE EXAMINATION

AGRICULTURAL SCIENCE (Single-Award)

General Proficiency

Paper 02

2 hours

READ THESE DIRECTIONS CAREFULLY.

1. There are nine questions in this booklet, six in Section I and three in Section II. Answer **ALL** questions.
2. Each question in Section I carries 4 marks. Each question in Section II carries 12 marks.
3. Write your answers in the spaces provided in this booklet.

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

SECTION I

Answer ALL questions in this section.

Write your answers in the spaces provided in this booklet.

1. Mrs James gets 10 hectares of arable land for agriculture.

(a) State TWO factors of production that she must consider.

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. . . . . .

(2 marks)

(b) Mrs James completes a loan application form but is unsuccessful in getting the loan. Suggest TWO criteria required to obtain a loan.

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(2 marks)

Total 4 marks

2. Caribbean agriculture is affected by many constraints (challenges). One constraint is a negative attitude towards agriculture.

(a) Name TWO OTHER constraints affecting agriculture in the Caribbean.

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(2 marks)

(b) Provide TWO arguments to convince your fellow students to become involved in agriculture.

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(2 marks)

Total 4 marks

3. Crop rotation is often recommended to farmers because it reduces levels of pests and diseases.

(a) Briefly explain how crop rotation reduces pests and diseases.

. . . .

. . . .

(2 marks)

(b) A farmer wants to grow corn, sweet potato, beans and lettuce. Complete the following crop rotation sequence which can be used for growing these crops.

(1)
Corn

(4) . . . .

(2) . . . .

(3) . . . .

(2 marks)

Total 4 marks

4. An agronomist conducts an experiment to study the effect of soil compaction on tuber production of yam.

(a) Name the part of the plant that is used for propagating yam.

.....

(1 mark)

(b) The plot of yam becomes heavily infested with weeds. State ONE effect this is likely to have on the production of yam.

.....

.....

(1 mark)

(c) Table 1 shows the results of the experiment conducted by the agronomist.

TABLE 1:
THE EFFECT OF SOIL COMPACTION ON TUBER YIELD IN YAM

Degree of Soil Compaction	Tuber Yield (t/ha)
Not compacted	20
Slightly compacted	15
Moderately compacted	12
Highly compacted	7

Describe the relationship between soil compaction and tuber yield, shown in Table 1.

.....

.....

(1 mark)

(d) A farmer attempts to till a compacted soil with a garden fork but he is unsuccessful. Recommend ONE tillage implement that can be used to break up the compacted layer.

.....

(1 mark)

Total 4 marks

5. A rabbit farmer needs to improve production on his rabbitry.

(a) State TWO breeding methods used in rabbit production.

. . . . . .

. . . . . .

(2 marks)

(b) To improve production of the next generation, the farmer decides to select rabbits showing high growth rates. Suggest TWO OTHER qualities or traits he may select.

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(2 marks)

Total 4 marks

6. (a) Figure 1 and Figure 2 show the digestive tract of a goat and a broiler bird respectively.

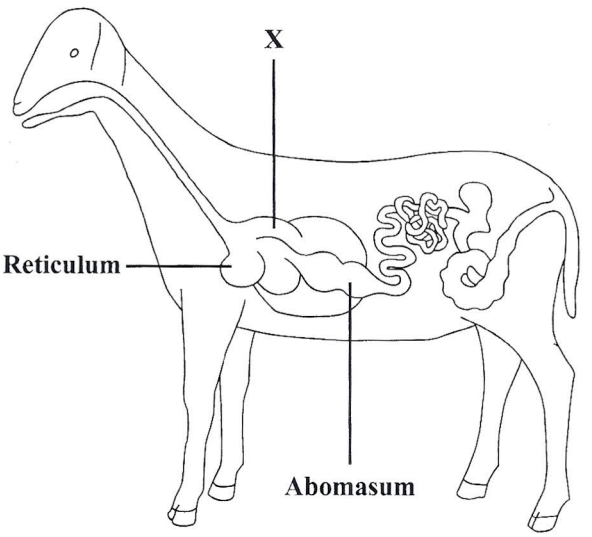

Figure 1. Digestive tract of a goat

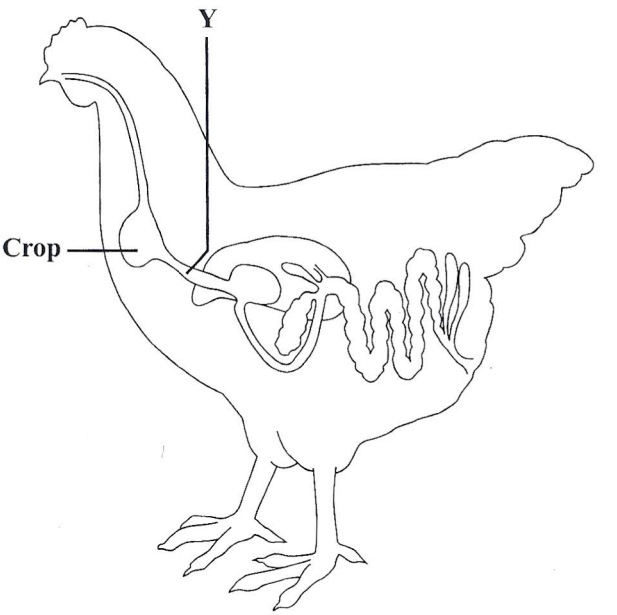

Figure 2. Digestive tract of a broiler bird

Identify the structures labelled **X** in Figure 1 and **Y** in Figure 2.

X: .....

Y: .....

(2 marks)

(b) A farmer digs a shallow pond on a clayey soil to rear tilapia. After filling the pond, the water almost completely drains out.

(i) Suggest the MOST likely cause of this problem.

.....

(1 mark)

(ii) Recommend ONE solution to this problem.

.....

(1 mark)

Total 4 marks

SECTION II

Answer ALL questions in this section.

Write your answers in the spaces provided in this booklet.

7. (a) Table 2 is an example of an incomplete breeding record of a doe. Three of the headings are missing.

TABLE 2: BREEDING RECORD OF A DOE

	Buck Used		**Number of Offspring Born Alive**	**Number of Offspring Died**		**Number Weaned**

Complete the record by inserting the following headings in the correct order in Table 2.

- Date doe kindled
- Date mated
- Date weaned

(3 marks)

(b) Farmer Raj grows corn and rears goats. Table 3 shows the financial accounts for his mixed farm enterprise.

TABLE 3: FINANCIAL ACCOUNT

Item	Money ($)
Goats sold	250 000
Replacement does	55 000
Housing and equipment	100 000
Farm operator salary	20 000
Cost of corn seeds	5 000
Subsidy on land preparation	10 000
Feed costs	50 000
Sale of corn	50 000
Casual labour	10 000

(i) Using the information in Table 3, list the variable costs and the fixed costs.

Variable Costs · $

Fixed Costs $

(3 marks)

(ii) Calculate the gross income and the net income. **Show all your working.**

Gross income

Net income

(4 marks)

(iii) State whether or not the farmer's business is successful. Explain your answer.

.....

.....

.....

(2 marks)

Total 12 marks

8. (a) (i) State TWO effects that the overuse of fertilisers may have on the environment.

.....

.....

(2 marks)

(ii) State ONE benefit of mulching.

.....

(1 mark)

(b) A farmer cultivates a leafy vegetable crop and a root crop on flat land. Compare the cultivating practices (similarities and differences) of these TWO crops under the following headings:

(i) Land preparation

(ii) Fertiliser application

(iii) Harvesting and post-harvest handling

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(9 marks)

Total 12 marks

9. (a) Name a meat breed for EACH of the following classes of livestock:

(i) Pig .....

(ii) Goat .....

(iii) Rabbit .....

(3 marks)

(b) An Agricultural Science student carried out an experiment over a four-week period to evaluate the performance of rabbits on a forage diet and on a concentrate diet. Table 4 shows the results of the experiment.

TABLE 4: FEEDING EXPERIMENT ON RABBITS

Week	Average Weight of Rabbit on a Forage Diet (kg)	Average Weight of Rabbit on a Concentrate Diet (kg)
1	0.4	0.4
2	0.5	0.6
3	0.9	1.2
4	1.2	1.4

(i) On which of the diets, forage or concentrate, did the rabbits gain MORE weight?

.....

(1 mark)

(ii) Calculate the increase in average weight of the rabbits on the concentrate diet, from one week to four weeks.

(1 mark)

(iii) At the end of four weeks, an average of 4.2 kg of feed was consumed by each rabbit. Calculate the Feed Conversion Ratio (FCR) on the concentrate diet, using the data in Table 4 on page 12.

(2 marks)

(iv) Explain the importance of Feed Conversion Ratio in livestock production.

. . . . . .

. . . . . .

(2 marks)

(c) One rabbit in the experiment showed the following signs:

- Frequent shaking of its head
- Scabs in its ear
- A foul-smelling substance oozing from the ear

Suggest the likely cause of this condition and state TWO methods for controlling it.

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(3 marks)

Total 12 marks

END OF TEST