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C A R I B B E A N E X A M I N A T I O N S C O U N C I L

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

AGRICULTURAL SCIENCE (Single-Award)

General Proficiency

Paper 02

2 hours

READ THE FOLLOWING INSTRUCTIONS 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 is worth 4 marks. Each question in Section II is worth 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.

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SECTION I

Answer ALL questions in this section.

Write your answers in the spaces provided in this booklet.

1. (a) Distinguish between 'Good Agricultural Practices' (GAP) and 'Hazard Analysis Critical Control Point' (HACCP).

GAP _____

_____

HACCP _____

_____

(2 marks)

(b) Choose the correct words from the words in brackets to complete the following sentence.

(human resources, services, money, goods, animals)

The CARICOM Single Market and Economy enables free movement of _____, capital, _____ and labour across member states in the Caribbean. **(2 marks)**

Total 4 marks

2. (a) Identify TWO advantages of keeping farm records.

_____

_____

(2 marks)

(b) Farmer Jane's labour record for three casual labourers is shown in Table 1. Advise Farmer Jane on TWO bits of information lacking in this record.

TABLE 1: LABOUR RECORD

Activity	Number of Days	Total Cost ($)
Land clearing	5	300
Planting	7	100
Pruning	2	100
Fertilizing and Harvesting	20	200
Total Labour Cost		**700**

_____

_____

_____

_____

(2 marks)

Total 4 marks

3. (a) A bag of fertilizer is labelled 8 : 16 : 24.

(i) What type of fertilizer does this represent?

_____

(1 mark)

(ii) Calculate the nitrogen to phosphorus ratio in this fertilizer.

(1 mark)

(b) Mr John produces compost on his farm by placing waste plant material in a heap, turning it regularly and adding water to maintain moist conditions. `Despite his effort the composting period takes about six months.

Suggest ONE way by which Mr John can reduce the composting period and give a reason for your answer.

_____

_____

(2 marks)

Total 4 marks

4. (a) A farmer wants to make a seedbed to sow his spinach seeds.

Identify TWO secondary tillage implements that he could use in preparing this seedbed.

_____

_____

(2 marks)

(b) Farmer Kahn grows genetically modified papaya on his farm.

Suggest TWO advantages of using genetically modified plants.

_____

_____

(2 marks)

Total 4 marks

5. (a) (i) State ONE function of the gizzard during digestion in poultry.

_____

(1 mark)

(ii) Name ONE material that can be added to a poultry diet to aid the function stated in (i) above.

_____

(1 mark)

(b) A student notices that rabbits are eating their own soft faeces at night and thinks that they are sick. Explain to the student TWO benefits of this habit to the rabbits.

_____

_____

(2 marks)

Total 4 marks

6. (a) What is meant by the term 'balanced ration'?

_____

_____

(2 marks)

(b) Table 2 shows information on the label of two poultry feeds.

TABLE 2: CONSTITUENTS OF TWO POULTRY FEEDS

Constituent	Feed A (%)	Feed B (%)
Crude protein (min.)	20.0	23.0
Crude fat (min.)	4.0	2.5
Crude fibre (max.)	3.0	3.0
Phophorus (min.)	0.6	0.6
Calcium (min.)	0.7	0.9

(i) Which of the two feeds is BETTER suited for broiler birds at 4–6 weeks of age?

_____

(1 mark)

(ii) Explain why fibre is an important component in BOTH feeds.

_____

(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) Farmer Mungal has been producing lettuce for five years and has recently started to produce it organically. Next to Farmer Mungal's plot, Suriya grows tomato which she frequently sprays with **inorganic** pesticides.

(i) Explain what is meant by 'organic farming'.

_____

_____

(2 marks)

(ii) State ONE way in which organic farming is likely to INCREASE farm income.

_____

(1 mark)

(iii) Advise Farmer Mungal of TWO reasons why he may NOT obtain organic certification for his lettuce farm.

_____

_____

(2 marks)

(b) Ms Zoe operates a one-hectare farm on which she cultivates cauliflower and eggplant to supply to a hotel. Sales to the hotel have been good and she is seeking to further expand production by another hectare. She employs seven casual labourers.

(i) Identify the type of budget that Ms Zoe needs to assist her in making the decision to expand her farm.

_____

(1 mark)

(ii) Table 3 shows the projected income and expenditure for Ms Zoe's two-hectare farm.

TABLE 3: PROJECTED INCOME AND EXPENDITURE FOR THE TWO-HECTARE FARM

	Cauliflower	**Eggplant**	**Total ($)**
Income ($)	3000	1000	4000
Total Variable Cost ($)	1600	1500	3100
Profit/Loss ($)	1400	–500	900

a) Based on the information given, give TWO reasons why Ms Zoe should expand her production to two hectares.

_____

_____

(2 marks)

b) Assuming that the price received for her produce will not change, advise Ms Zoe of TWO ways by which she could improve the profitability of her farm.

_____

_____

(2 marks)

(c) Ms Zoe has recently acquired a handheld tractor that costs $1000. Assuming a rate of depreciation of 10% per annum, calculate the value of the tractor after five years. **Show all your working**.

[Depreciation = cost × % depreciation × number of years
Value = cost – depreciation]

(2 marks)

Total 12 marks

8. (a) A farmer planted a cabbage crop which he harvested after six weeks. The harvested cabbages were immediately placed in a crocus bag and transported in an open-tray truck to the market. The farmer was unable to sell the majority of his cabbages because of poor quality.

(i) Explain the difference between harvest and postharvest operations.

Harvest _____

_____

Postharvest _____

_____

(2 marks)

(ii) Identify TWO harvest or TWO postharvest practices which contributed to the poor quality cabbages and suggest appropriate measures to overcome them.

Practice _____

_____

Solution _____

_____

Practice _____

_____

Solution _____

_____

(4 marks)

(b) The farmer observes that after ploughing and rotavating the soil on his land, it becomes powdery and the particles are easily blown away by the wind.

Explain THREE environmentally friendly soil-management practices which could be used to correct this problem.

_____

_____

_____

_____

_____

_____

(6 marks)

Total 12 marks

9. (a) A landless goat farmer allows his goats to graze in a nearby communal pasture of local grasses.

State TWO advantages and ONE disadvantage of this method of grazing.

Advantages _____

_____

Disadvantage _____

_____

(3 marks)

(b) The farmer is also rearing layer birds for table eggs. He uses the piece of equipment shown in Figure 1.

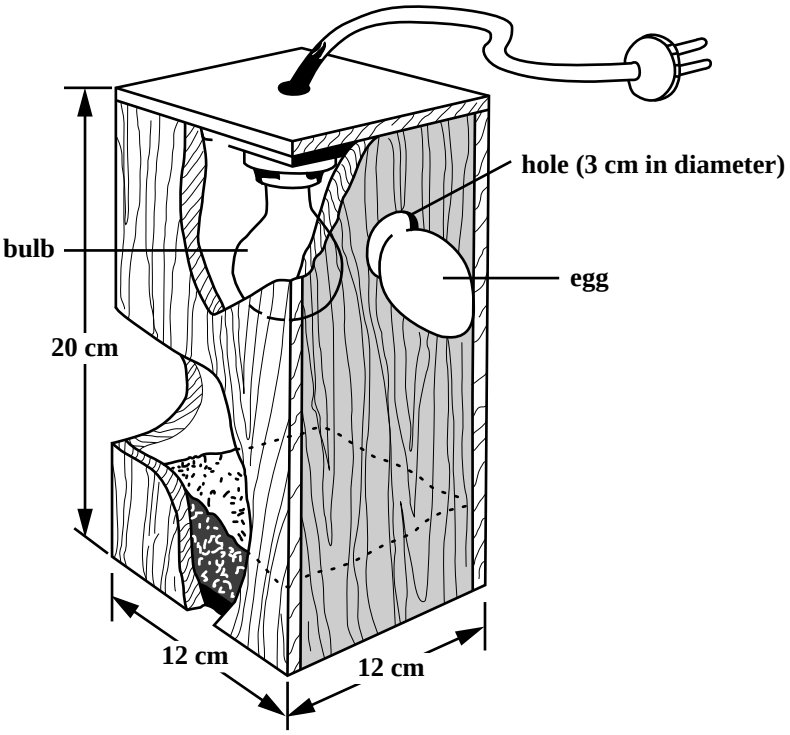


Figure 1. Equipment used in rearing layer birds

(i) Identify the piece of equipment shown in Figure 1.

_____

(1 mark)

(ii) Explain how this piece of equipment is used to separate fertile eggs from infertile eggs.

_____

_____

(2 marks)

GO ON TO THE NEXT PAGE

(c) A beekeeper notices that a new queen with many worker bees emerges from the hive and forms a swarm on a nearby tree.

(i) Suggest THREE reasons why the bees have swarmed.

_____

_____

_____

(3 marks)

(ii) Explain ONE management practice that the beekeeper could adopt to prevent swarming.

_____

_____

(2 marks)

(iii) Suggest ONE advantage of swarming to the beekeeper.

_____

(1 mark)

Total 12 marks

END OF TEST

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