

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE®  
EXAMINATION

“\*”Barcode Area”\*”  
Front Page Bar Code

08 MAY 2019 (p.m.)

FILL IN ALL THE INFORMATION REQUESTED CLEARLY IN CAPITAL LETTERS.

TEST CODE 

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SUBJECT AGRICULTURAL SCIENCE – Paper 02 (Single Award)

PROFICIENCY GENERAL

REGISTRATION NUMBER 

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SCHOOL/CENTRE NUMBER  

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NAME OF SCHOOL/CENTRE  

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CANDIDATE’S FULL NAME (FIRST, MIDDLE, LAST)  

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DATE OF BIRTH 

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SIGNATURE \_\_\_\_\_

“\*”Barcode Area”\*”  
Current Bar Code

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Sequential Bar Code

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FORM TP 2019046



TEST CODE **01203020**

MAY/JUNE 2019

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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01203020/MJ/CSEC 2019

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**SECTION I**

**Answer ALL questions in this section.**

**Write your answers in the spaces provided in this booklet.**

1. (a) Farmer George cultivates vegetable crops on his half-acre organic farm, which is situated on a hillside, and obtains water from a river that runs below his farm.

(i) Define the term ‘organic farming’.

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**(2 marks)**

(ii) State ONE disadvantage of organic farming.

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**(1 mark)**

(iii) Explain ONE way in which Farmer George’s organic farm can benefit the environment.

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**(2 marks)**

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- (b) Farmer George recently rented Farmer Mary a plot of land adjacent to his farm to establish a vegetable plot. Farmer Mary uses genetically modified seeds, pesticides and artificial fertilizers to grow her crops. Farmer George has applied for organic certification for his farm and his application was denied.

Using information from the scenario above, suggest THREE reasons why Farmer George’s application was denied.

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**(3 marks)**

- (c) The Minister of Agriculture in Country A is asking the government for an increase in the budgetary allocation for agriculture.

Suggest TWO reasons the minister could use to justify the request for an increase in the budgetary allocation for agriculture.

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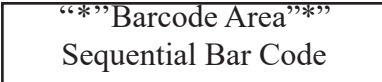
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**(2 marks)**

**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. (a) (i) Define the term ‘vegetative propagation’.

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**(1 mark)**

- (ii) State ONE vegetative propagation method used to produce banana plants.

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**(1 mark)**

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(b) Farmer Wayne wants to plant a plot of cassava. The extension officer visits his farm and advises him that proper primary tillage is important in cassava production.

(i) Suggest TWO reasons why proper primary tillage is important in preparing soil for planting cassava.

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**(2 marks)**

(ii) Other than tillage, state ONE land preparation method that Farmer Wayne must use in preparing his plot of land to plant the cassava crop.

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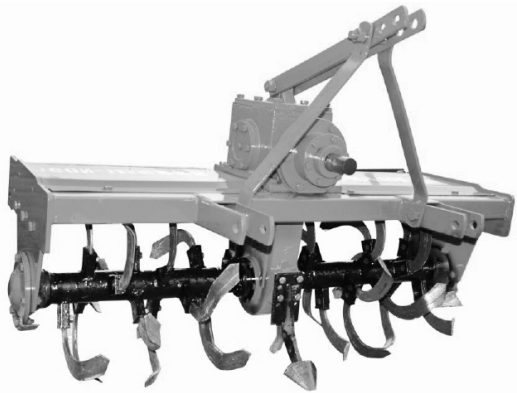
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- (c) Mrs Brown wants to expand her hot pepper farm. The extension officer advises her that she should use mechanical land preparation methods instead of manual methods. Figure 1 shows two implements that are used for tillage.



**Implement A**



**Implement B**

**Figure 1. Tillage implements**

- (i) Normally, Mrs Brown would use a fork to perform primary tillage manually. Which of the implements, A or B, could she use for primary tillage? State ONE reason in support of your choice.

Implement ..... (1 mark)

Reason .....  
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DO NOT WRITE IN THIS AREA

- (ii) Suggest TWO advantages and ONE disadvantage of using machinery in land preparation.

Advantages .....

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Disadvantage .....

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**(3 marks)**

**Total 10 marks**

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4. (a) Farmer Steve cultivates tomatoes on clayey soil. He observes that during harvest in the rainy season, the fruits have cracks and splitting skins. The extension officer visits his farm and identifies that too much water is the cause of the problem.

State THREE cultural practices Famer Steve can use to address the problem of excess water in the soil.

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(3 marks)

- (b) Neela is a plant breeder who wants to breed a red stem celery plant. To achieve this, she crosses two plants with the Rr gene for red stem colour. The offspring of this cross is called the F<sub>1</sub> Generation.

- (i) Complete Table 1 to show the genotype of the F<sub>1</sub> Generation.

**TABLE 1: RESULTS OF CROSS**

Gametes	R	r
R	.....	.....
r	.....	.....

(2 marks)

- (ii) Calculate the percentage of plants that will be heterozygous for red stem colour.

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(1 mark)

GO ON TO THE NEXT PAGE

- (c) Genetic engineering is used to produce crops such as extended shelf life tomatoes.

Explain TWO ways in which farmers can benefit from growing genetically modified crops.

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**(4 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. Figure 2 shows Farmer John's animals feeding on forage.



**Figure 2. Farm animals feeding on forage**

- (a) (i) Identify the method being used to feed forage to the animals.

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**(1 mark)**

- (ii) State ONE advantage and ONE disadvantage of using the method shown in Figure 2 to feed forage to animals.

Advantage .....

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Disadvantage .....

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**(2 marks)**

- (iii) Suggest TWO reasons why it is important for Farmer John to include forage when feeding his animals.

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**(2 marks)**

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(b) A farmer who practises rotational grazing observes that parasite infestation is well controlled in his cattle.

(i) Suggest THREE ways in which rotational grazing helps to control the level of parasite infestation.

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**(3 marks)**

(ii) During the rainy season, it is easier for farmers to obtain forage to feed their animals. However, in the dry season many farmers experience difficulty finding high quality forage to feed their animals.

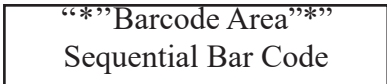
Suggest TWO methods farmers can implement in order to conserve forage for use in the dry season.

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**(2 marks)**

**Total 10 marks**

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6. Farmer Telly wants to increase the size of his dairy herd but finds it very costly to rear bulls. He is advised by the extension officer to make use of the artificial insemination (AI) services provided by the Ministry of Agriculture in his area.

(a) (i) State TWO reasons why Farmer Telly is encouraged to use artificial insemination as a method of breeding in his dairy enterprise.

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(2 marks)

(ii) State ONE problem Farmer Telly might encounter in using artificial insemination in his dairy enterprise.

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(1 mark)

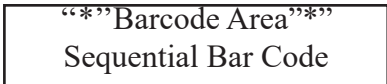
(b) After using the artificial insemination services provided by the Ministry of Agriculture, Farmer Telly observed that none of his cows conceived.

Suggest THREE possible reasons why none of the cows conceived.

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(3 marks)

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(c) Farmer Zoe placed a batch of eggs in an incubator to hatch. After 21 days, she noticed that none of the eggs hatched.

(i) Suggest TWO possible reasons why the eggs did not hatch.

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**(2 marks)**

(ii) Upon closer examination of the eggs, the shells were observed to be thin and cracked. Explain ONE reason for this observation.

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**(2 marks)**

**Total 10 marks**

**END OF TEST**

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

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## CANDIDATE'S RECEIPT

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### INSTRUCTIONS TO CANDIDATE:

1. **Fill in all the information requested clearly in capital letters.**

TEST CODE: 

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SUBJECT: AGRICULTURAL SCIENCE (Single Award) – Paper 02

PROFICIENCY: GENERAL

REGISTRATION NUMBER: 

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FULL NAME: \_\_\_\_\_  
**(BLOCK LETTERS)**

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

2. **Ensure that this slip is detached by the Supervisor or Invigilator and given to you when you hand in this booklet.**
3. **Keep it in a safe place until you have received your results.**
- 

### INSTRUCTION TO SUPERVISOR/INVIGILATOR:

Sign the declaration below, detach this slip and hand it to the candidate as his/her receipt for this booklet collected by you.

I hereby acknowledge receipt of the candidate's booklet for the examination stated above.

Signature: \_\_\_\_\_  
Supervisor/Invigilator

Date: \_\_\_\_\_