CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

08 MAY 2019 (p.m.)

M 1 9 0 1 2 0 2 0 2 0

FILL IN ALL THE INFORMATION REQUESTED CLEARLY IN CAPITAL LETTERS.

TEST CODE | 0 | 1 | 2 | 0 | 2 | 0 | 2 | 0 |

SUBJECT AGRICULTURAL SCIENCE – Paper 02 (Double Award)

769

PROFICIENCY GENERAL

REGISTRATION NUMBER | | | | | | | | | | |

SCHOOL/CENTRE NUMBER					

NAME OF SCHOOL/CENTRE

A001

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

DATE OF BIRTH | D | D | M | M | Y | Y | Y | Y |

SIGNATURE _____



DO NOT
WRITE ON
THIS PAGE

FORM TP 2019043

TEST CODE 01202020

MAY/JUNE 2019

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

AGRICULTURAL SCIENCE (Double Award)

Paper 02 – General Proficiency

2 hours

769

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.**

A001

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

Copyright © 2018 Caribbean Examinations Council
All rights reserved.

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'.

.....

.....

.....

.....

(2 marks)

(ii) State ONE disadvantage of organic farming.

.....

.....

.....

.....

(1 mark)

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

.....

.....

.....

.....

.....

.....

.....

(2 marks)

GO ON TO THE NEXT PAGE

769

A001

DO NOT WRITE IN THIS AREA

(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.

.....

.....

.....

.....

.....

.....

.....

.....

.....

(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.

.....

.....

.....

.....

.....

.....

(2 marks)

Total 10 marks

769 A001

2. (a) (i) Define the term 'value chain'.

.....

.....

.....

.....

(2 marks)

(ii) State ONE **major** difference between a 'supply chain' and a 'value chain'.

.....

.....

.....

.....

(1 mark)

(b) Farmers in Mount Dew have been the only suppliers of yams in their area for over 10 years. Recently, they have been complaining that the price of their yams has been reduced by 50 per cent over the past year.

(i) Suggest THREE reasons for the reduction in the price of the yams.

.....

.....

.....

.....

.....

.....

.....

.....

.....

(3 marks)

(ii) Suggest ONE way in which the farmers of Mount Dew could get better prices for their yams.

.....

.....

.....

(1 mark)

(c) Suraj is unemployed and wants to start rearing livestock to earn an income, even though he has never reared livestock before. Suraj has no land on which to establish his livestock farm. He has identified a nearby plot of land belonging to his neighbour who lives overseas, which he can use to rear his livestock. Suraj has not determined the size of his operations, the cost or type of livestock he wants to rear. He is advised by his friend to visit the Agricultural Development Bank to apply for a loan to purchase the livestock.

Considering the scenario above, advise Suraj of THREE challenges that he may encounter in trying to obtain a loan.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(3 marks)

Total 10 marks

DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA
769
A001

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'.

.....

.....

.....

.....

(1 mark)

769

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

.....

.....

(1 mark)

A001

DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA

(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.

.....

.....

.....

.....

.....

.....

(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.

.....

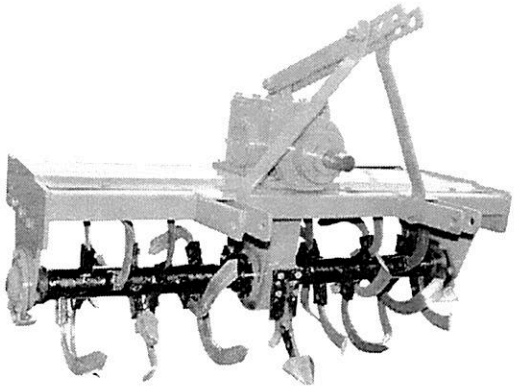
.....

.....

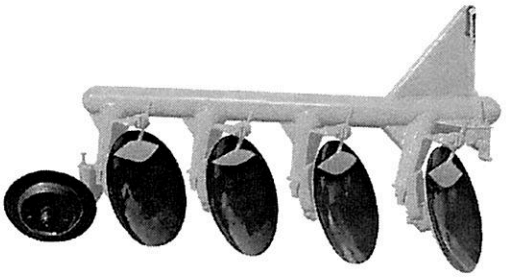
(1 mark)

DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA
A001 769

(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 .....

.....

.....

.....

(1 mark)

769

A001

DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA

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

Advantages .....

.....

.....

.....

.....

.....

Disadvantage .....

.....

.....

.....

.....

(3 marks)

Total 10 marks

DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA
A001 769

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.

.....

.....

.....

.....

.....

.....

(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_1 Generation.

(i) Complete Table 1 to show the genotype of the F_1 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.

.....

(1 mark)

GO ON TO THE NEXT PAGE

769

A001

DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA

(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.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(4 marks)

Total 10 marks

769

A001

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.

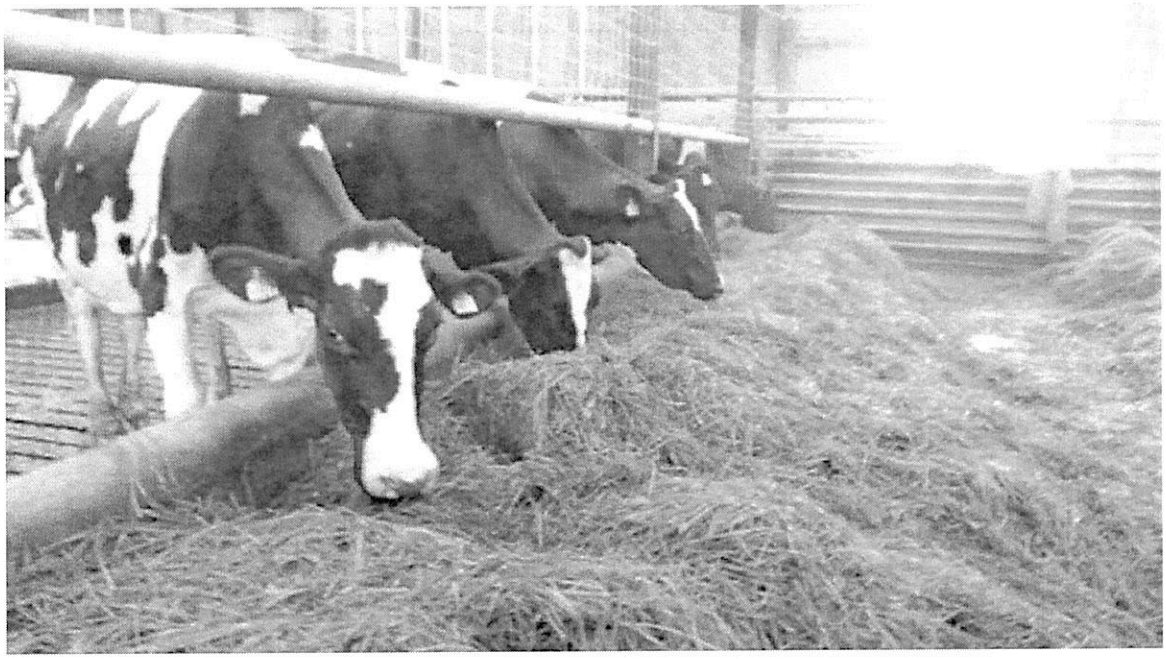


Figure 2. Farm animals feeding on forage

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

.....

.....

(1 mark)

769

A001

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

Advantage .....

.....

.....

Disadvantage .....

.....

.....

(2 marks)

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

.....

.....

.....

.....

.....

.....

(2 marks)

769

A001

(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.

.....

.....

.....

.....

.....

.....

.....

.....

.....

(3 marks)

769

(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.

.....

.....

.....

.....

.....

.....

(2 marks)

A001

Total 10 marks

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.

.....

.....

.....

.....

.....

(2 marks)

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

.....

.....

.....

.....

(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.

.....

.....

.....

.....

.....

.....

.....

(3 marks)

GO ON TO THE NEXT PAGE

769 A001

(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.

.....

.....

.....

.....

.....

.....

.....

(2 marks)

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

.....

.....

.....

.....

.....

.....

.....

(2 marks)

Total 10 marks

END OF TEST

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

EXTRA SPACE

If you use this extra page, you MUST write the question number clearly in the box provided.

Question No. ☐

769

A001

EXTRA SPACE

If you use this extra page, you MUST write the question number clearly in the box provided.

Question No. ☐

769

A001

EXTRA SPACE

If you use this extra page, you MUST write the question number clearly in the box provided.

Question No. ☐

769

A001

EXTRA SPACE

If you use this extra page, you MUST write the question number clearly in the box provided.

Question No. ☐

769

A001



DO NOT
WRITE ON
THIS PAGE

CANDIDATE'S RECEIPT

INSTRUCTIONS TO CANDIDATE:

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

TEST CODE: | 0 | 1 | 2 | 0 | 2 | 0 | 2 | 0 |

SUBJECT: AGRICULTURAL SCIENCE (Double Award) – Paper 02

PROFICIENCY: GENERAL

REGISTRATION NUMBER: | | | | | | | | | | |

769

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.

A001

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

Signature: _____
Supervisor/Invigilator

Date: _____