TEST CODE **01203020**

FORM TP 2012043

MAY/JUNE 2012

CARIBBEAN EXAMINATIONS COUNCIL

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 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. (a) Identify the agricultural career associated with EACH of the following:

(i) A person who advises farmers on crop and livestock management

_____

(1 mark)

(ii) A person who treats diseases in livestock

_____

(1 mark)

(b) A biotechnologist predicts that in the near future the Caribbean region will be faced with severe food shortages. Suggest ONE way in which biotechnology can improve

(i) crop production

_____

_____

(1 mark)

(ii) livestock production.

_____

_____

(1 mark)

Total 4 marks

2. Figure 1 shows the demand and supply curves for sorrel in the Caribbean.

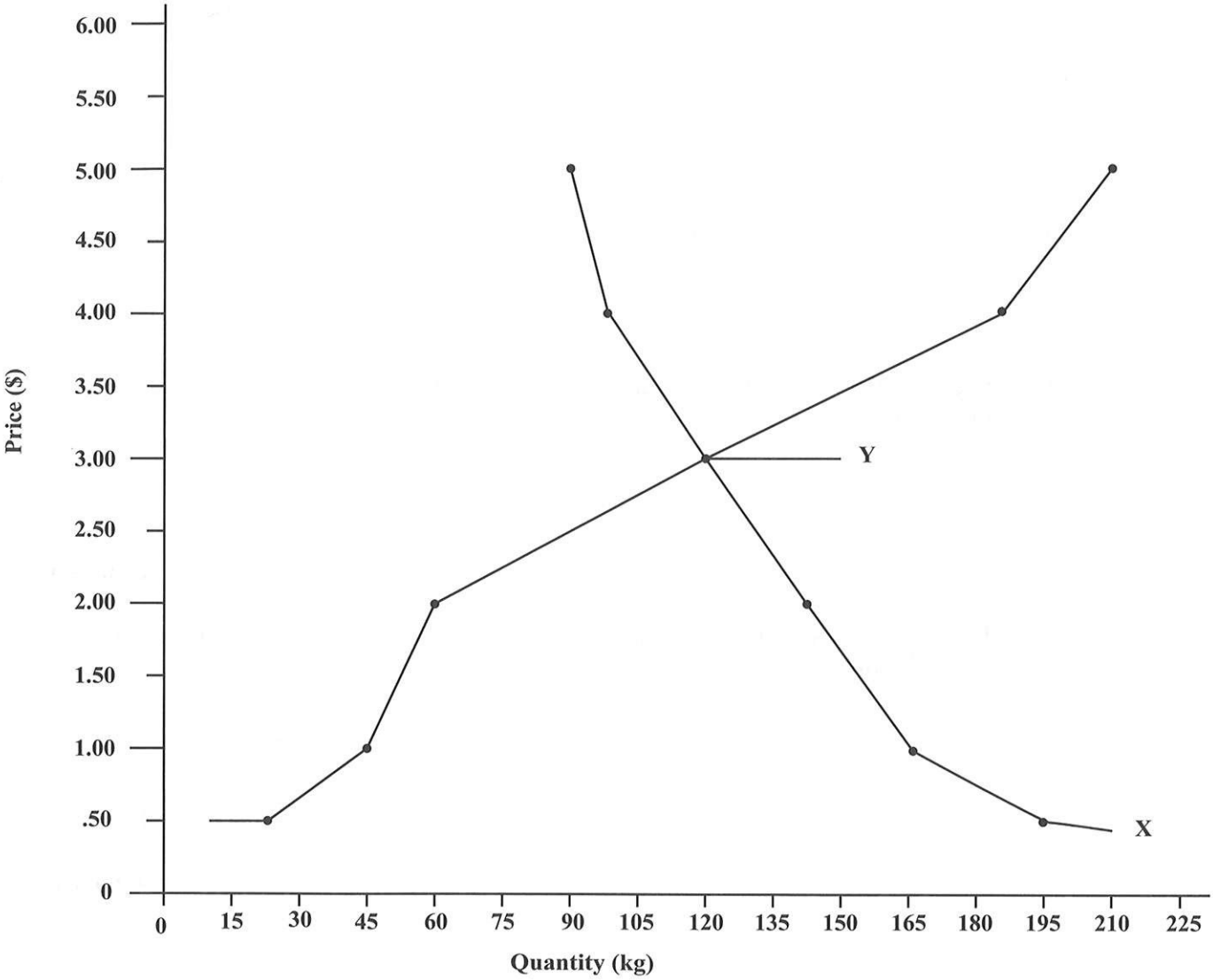


Figure 1. Demand and supply curves for sorrel

(a) Identify X and Y in Figure 1.

X _____

Y _____

(2 marks)

(b) A farmer observes over the years that in January there is an oversupply of sorrel on the market. Suggest TWO strategies that the farmer can use to make money from his surplus sorrel crop.

(i) _____

(ii) _____

(2 marks)

Total 4 marks

GO ON TO THE NEXT PAGE

3. Farmers Ramesh and Leela have land in the same agricultural area. Soil tests indicate that the soil from Ramesh's plot has a pH of 4.5 and the soil from Leela's plot has a pH of 6.5.

(a) What is meant by the term 'pH'?

_____

(1 mark)

(b) On whose plot of land is the soil MORE acidic?

_____

(1 mark)

(c) Suggest ONE reason that may account for the difference in soil pH between the two plots of land.

_____

_____

(1 mark)

(d) Recommend ONE soil management practice that can be used to increase the productivity of acidic soils.

_____

_____

(1 mark)

Total 4 marks

4. A soil scientist conducts an experiment to determine the effect of burning on soil erosion. The data obtained from the study are presented in Table 1.

TABLE 1: THE EFFECT OF BURNING ON SOIL EROSION

Treatment	Soil Erosion (tonnes per hectare)
No burning	5
Burning for 10 minutes	15
Burning for 30 minutes	25

(a) What is meant by the term 'soil erosion'?

_____

_____

(1 mark)

(b) What is the relationship between burning and soil erosion as indicated in Table 1?

_____

_____

(2 marks)

(c) Name ONE soil management practice that can be used to reduce soil erosion.

_____

(1 mark)

Total 4 marks

5. Your agricultural science class is responsible for rearing 100 broiler chicks.

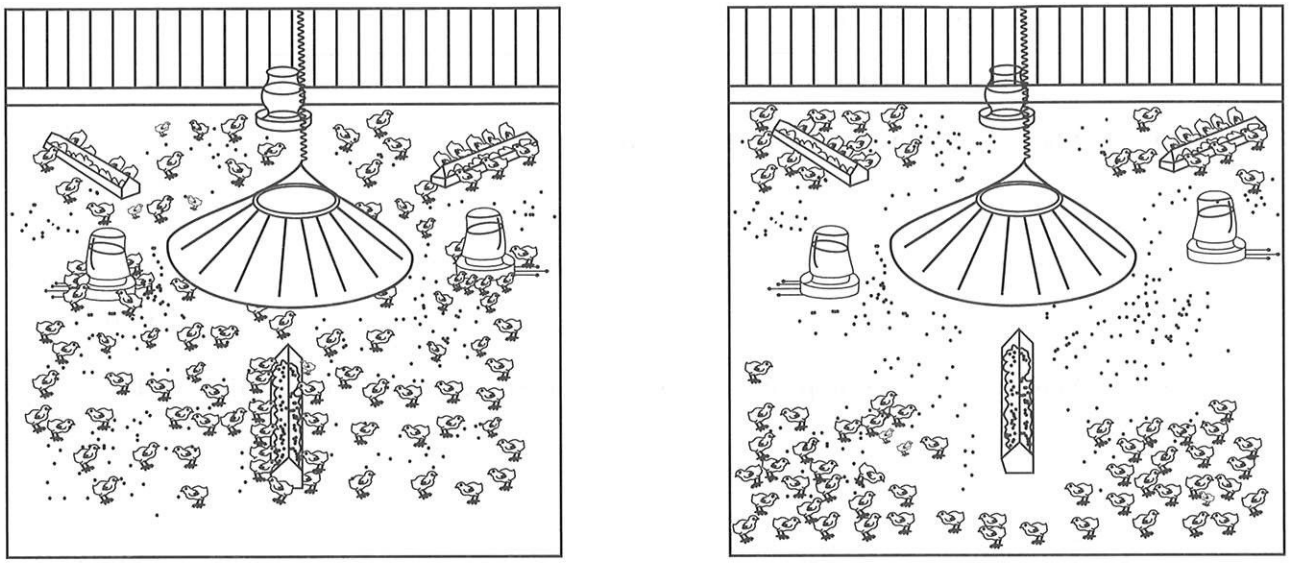
(a) Name the ration that is fed to the chicks at

(i) two weeks of age _____

(ii) five weeks of age. _____

(2 marks)

(b) Figure 2 shows brooding of one-day-old chicks in two different situations.



Situation A **Situation B**

Figure 2. Broiler chicks in a brooder

Suggest a reason for the difference in the way the chicks are distributed in A and in B.

A: _____

_____

B: _____

_____

(2 marks)

Total 4 marks

6. (a) State TWO advantages of artificial insemination (AI) in farm animals.

_____

_____

(2 marks)

(b) A farmer wants to produce goats during the months of October to December. His Extension Officer advises him to use oestrus synchronisation or artificial insemination. His advice to the farmer is based on the information in Table 2.

TABLE 2: NUMBER OF GOATS PRODUCED USING DIFFERENT REPRODUCTIVE TECHNIQUES

Reproductive Technique	Number of Goats Produced		
	October	November	December
Artificial insemination	70	100	130
Oestrus synchronisation	100	100	130

Which is the better reproductive technique for producing goats over the months of October to December? Give ONE reason for your answer.

_____

_____

_____

(2 marks)

Total 4 marks

SECTION II

Answer ALL questions in this section.

Write your answers in the spaces provided in this booklet.

7. (a) Define EACH of the following terms:

(i) Working capital

_____

_____

(ii) Fixed capital

_____

_____

(iii) Subsidy

_____

_____

(3 marks)

(b) The government of a Caribbean country has given a rural community a tractor to assist them in agricultural production.

(i) Suggest THREE benefits that the tractor will bring to the rural community.

_____

_____

_____

_____

_____

_____

(3 marks)

(ii) Suggest THREE additional incentives the government can provide to further improve agriculture in this community.

_____

_____

_____

(3 marks)

(c) Complete the loan application form below by writing THREE requirements that a farmer needs in order to qualify for a loan from a commercial bank.

Penny Pinchers Bank Ltd.
12 Hutton Street
Zanadu, W.I.

LOAN APPLICATION FORM

Name: Mr Work Dailey
Address: 21 Camp Road, St Catherine, Xanadu

Requirements

1. _____

_____

2. _____

_____

3. _____

_____

(3 marks)

Total 12 marks

8. (a) Briefly describe EACH of the following methods of controlling pests and diseases in agriculture:

(i) Manual

_____

_____

(ii) Mechanical

_____

_____

(iii) Chemical

_____

_____

(3 marks)

(b) CARDI has been informing farmers about white fly infestation on tomato production. They conducted an experiment on the use of sticky traps and insecticides on white fly control. Table 3 shows the results of the experiment.

TABLE 3: CONTROL OF WHITE FLY IN TOMATO PRODUCTION USING DIFFERENT METHODS

Control of White Fly	Sticky Trap	Insecticide	Sticky Trap and Insecticide
Number of dead white flies	1 000	4 000	5 100

(i) What THREE conclusions can be drawn from the information in Table 3?

_____

_____

_____

_____

_____

_____

(3 marks)

(ii) Suggest THREE OTHER methods that can be used to control white flies in tomato production.

_____

_____

_____

(3 marks)

(c) A Livestock Officer decided to introduce a new forage legume from Africa into a Caribbean country. The legume seeds arrived at the airport but had to be destroyed by the Plant Quarantine Officer.

Suggest THREE possible reasons why the seeds had to be destroyed by the Plant Quarantine Officer.

_____

_____

_____

_____

_____

_____

(3 marks)

Total 12 marks

9. (a) Name THREE ingredients that can be used in making livestock feeds.

_____

_____

_____

(3 marks)

(b) A poultry farmer wants to know if rearing broilers on sand is better than rearing them on wood shavings litter. The effect of sand and wood shavings litter on feed conversion ratio (FCR) over four weeks is shown in Table 4.

TABLE 4: EFFECT OF SAND AND WOOD SHAVINGS LITTER ON FEED CONVERSION RATIO (FCR) IN BROILERS

Week	FCR on Sand	FCR on Wood Shavings Litter
1	1.0	1.0
2	1.5	1.5
3	2.5	2.0
4	3.0	2.5

Figure 3 represents the data in Table 4.

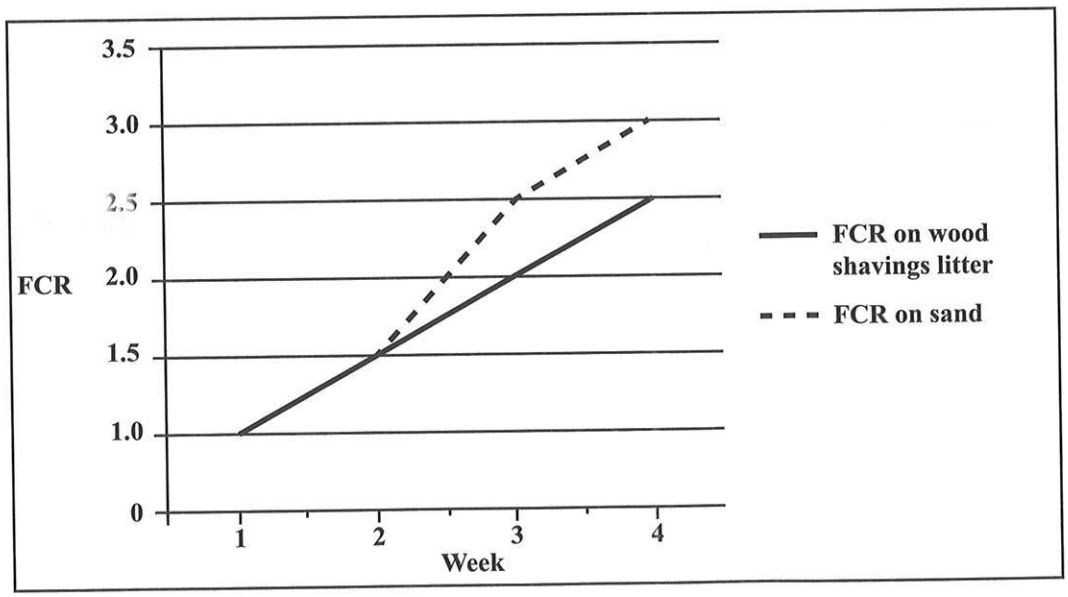


Figure 3. Effect of sand and wood shavings litter on FCR in broilers

(i) Calculate the average FCR over the four weeks on the sand and wood shavings litter systems.

Sand

Wood shavings litter

(2 marks)

(ii) Which is the better system of rearing broilers? Suggest ONE reason for your answer.

_____

_____

_____

(2 marks)

(iii) Explain ONE possible effect of EACH of the two systems on the health of the broilers.

_____

_____

_____

_____

(2 marks)

(iv) Suggest THREE OTHER management practices that can affect the performance of broilers up to market age.

_____

_____

_____

(3 marks)

Total 12 marks

END OF TEST

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