



CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN ADVANCED PROFICIENCY EXAMINATION®

AGRICULTURAL SCIENCE

UNIT 2 – Paper 02

2 hours 30 minutes

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of SIX questions in TWO 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 to answer questions.
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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SECTION A

Answer ALL questions.

1. An elderly farmer passes on his estate to his grandson and advises him to keep the trees. The cocoa trees are old and shaded by *Immortelle* trees and the estate is on sloping land that receives high rainfall but the soil becomes dry during the dry season. The young man wants to increase the profitability of the estate by converting a part of the land to vegetable production and by replanting new cocoa trees on the remaining portion.

(a) Explain the potential effects that land clearing for vegetable production can have on EACH of the following:

(i) Water supply on the farm

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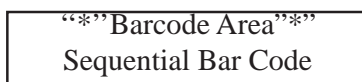
[2 marks]

(ii) Water supply in downhill off-farm locations

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(c) State THREE environmental benefits of having cocoa and *Immortelle* trees on the land.

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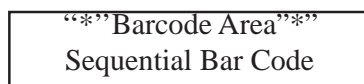
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2. The government of a Caribbean country is considering boosting food and nutrition security by encouraging increased production of small ruminants as a source of protein. Two major decisions that have to be made are the breed of the animals and the selection of the feed.

(a) (i) Recommend TWO tropical meat breeds of sheep for the Caribbean.

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[2 marks]

(ii) Explain TWO reasons why the tropical breeds are more suitable for the Caribbean than temperate breeds.

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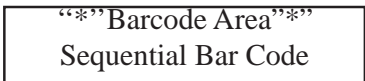
[2 marks]

(b) If the decision is made to develop hybrids from tropical sheep breeds for meat production, briefly explain THREE traits on which their selection should be based.

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- (c) Select a locally grown forage for dairy goats, and give TWO reasons for this selection.

Forage

Reason

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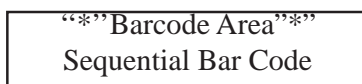
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3. In several schools in the Caribbean, there is interest in implementing school-feeding programmes in which schools contribute a portion of the food. This might be easier to achieve in schools in rural areas.

(a) (i) Identify THREE animal species that can be used as micro-livestock in rural schools.

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[3 marks]

(ii) Explain TWO factors that may impact on the suitability of urban schools for micro-livestock propagation.

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[4 marks]

(iii) Explain ONE advantage and ONE disadvantage, from a consumer perspective, of using micro-livestock as a food source for the school-feeding programmes.

Advantage

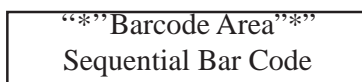
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Disadvantage

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(b) An aquaculture farmer's income is below expectations because the mean harvestable size per fish is low. The ponds are stocked with a suitable population of both male and female fish, there are no disease problems and the level of nutrition is adequate. An Extension Officer advises the farmer to use sperm sexing.

(i) What is meant by 'sperm sexing'?

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[1 mark]

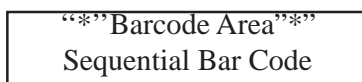
(ii) Explain how sperm sexing could increase the harvestable size of the fish.

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SECTION B

Answer ALL questions.

4. Figure 1 shows the levels of different pollutants in the atmosphere.

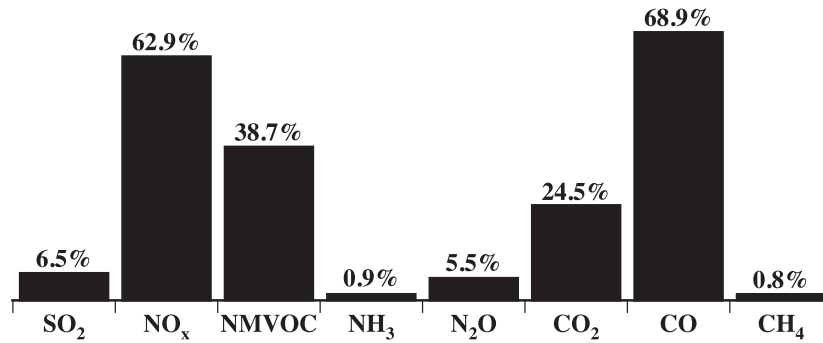


Figure 1. Levels of different pollutants in the atmosphere

Identify by name SO₂, NO_x, NMVOC, NH₃ and CO₂. Describe the sources of these pollutants and their effect on the air quality.

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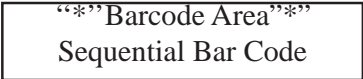
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5. Farmer Clark has 200 beef cattle on a Caribbean island. The change of the season has caused his cattle to lose muscle mass. He fears that animals may soon begin to die. Farmer Clark has a strict extensive production system. He is also concerned that he may have difficulty marketing the thin cattle.

(a) Explain why the cattle are most likely losing muscle mass.

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[3 marks]

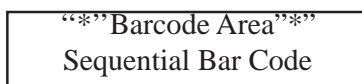
(b) Suggest TWO ways in which Farmer Clark could increase the marketability of his beef, and TWO socio-economic factors that could affect marketability.

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- (c) Susann is producing minced chicken. Suggest FIVE critical control points where hazards could occur in the process.

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[5 marks]

Total 15 marks

END OF TEST

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

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