

**CARIBBEAN EXAMINATIONS COUNCIL**

**REPORT ON CANDIDATES' WORK IN THE  
SECONDARY EDUCATION CERTIFICATE EXAMINATION**

**JUNE 2006**

**AGRICULTURAL SCIENCE  
(SINGLE AWARD)**

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**AGRICULTURAL SCIENCE (SINGLE AWARD)**

**GENERAL PROFICIENCY EXAMINATIONS  
JUNE 2006**

**GENERAL COMMENTS**

The Caribbean Examinations Council offered Agricultural Science (Single Award) General Proficiency Examination for the fourteenth year in 2006. The rationale for this offering in the area of agriculture is to make agricultural education available to a larger group of the secondary school population than is presently catered for by the Double Award. This increased exposure is desirable for improving attitudes to agriculture, promoting agriculture as a business, encouraging larger numbers of school leavers to enter fields related to agricultural endeavours, and for sustainability in selected agricultural commodities in the CARICOM region.

The examination is conducted with the assumption that there is compulsory exposure to the subject during the first three years of secondary education and a careful and systematic study of the requirements of the syllabus during the fourth and fifth years.

The 2006 examination was designed to provide a comprehensive test of candidates' knowledge and skills in all dimensions of the syllabus, such as:

- (a) knowledge and understanding of the content of the syllabus
- (b) fundamentals of Agricultural Science
- (c) ability to make precise links between Agricultural Science theory and practice
- (d) ability to perform a selected range of general agricultural skills from the core and the chosen option
- (e) ability to communicate knowledge and understanding in the approach to answering the questions and solving problems.

Candidates can choose from two options: Option A – Crops and Soils (C&S), Option B – Animal Science (AS). Candidates choose an option at the beginning of the first year and complete the SBA component for that option during the two years. They are examined on the core of the syllabus and write an essay paper based on the previously chosen option.

The Examining Committee is satisfied that the objectives of the examination were satisfactorily met and that the results reflect a valid discrimination among candidates, on the basis of their abilities to deal with the content of the syllabus.

**Form of the Examination**

The examination comprised three written papers as described briefly below and a School-based Assessment (SBA) component.

- (a) Paper 01 Sixty Multiple Choice items under the Knowledge and Comprehension Profile dimension and based on objectives on the core of the syllabus.
- (b) Paper 02 Ten compulsory structured questions based on the objectives in the core of the syllabus under the two profile dimensions – Knowledge and Comprehension, and Use of Knowledge

- (c) Paper 03 Four essay-type questions set on each option: candidates are required to answer three questions from the option chosen. These were also tested under the Knowledge and Comprehension, and Use of Knowledge profiles.
- (d) SBA Candidates were assessed on a number of skill objectives, preparation of a Farm Diary and compilation of Farm Records.

## SPECIFIC COMMENTS

### PAPER 01

This paper consisted of 60 multiple-choice items distributed over the five units in the core of the syllabus.

### PAPER 02

#### Question 1

This question tested the candidates' knowledge of the benefits of increased food production and the negative impact of agricultural development in their country.

In Part (a), candidates' responses suggested that this question was clearly understood. One noticeable area of concern in the responses was that a significant number of candidates confused "factors of production" with "benefits of production".

Part (b) of the question proved a little more challenging. Most candidates, while identifying factors adversely affecting the development of agriculture in their country, were unable to properly discuss the factors identified.

Candidates who attempted the (b) part of the question responded poorly, while a substantial percentage of them did not respond.

#### Question 2

This question tested candidates' knowledge: (i) of farm income and how it is classified (ii) to precisely define a simple agricultural economics concept (iii) at interpreting information provided on a graph and (iv) of principles governing marketing of agricultural produce. The response to this question was good.

#### Question 3

This was a two-part question. Part (a), focused on simple equipment and machines used in every day agricultural activities. Candidates were provided with a list of agricultural equipment and machines and asked to match these equipment and machines to the agricultural activity for which they are used. This part of the question was generally well done, however some common incorrect responses indicated that some candidates did not properly interpret the question.

Part (b) of the question tested candidates' knowledge of the use and maintenance of milking machines for milking cows. Candidates' responses to this part of the question were also generally good.

#### **Question 4**

Part (a) tested candidates' knowledge of Caribbean soil types and factors affecting soil fertility.

This part of the question was generally well done. The majority of candidates scored high marks in this part of the question.

Part (b) of the question required candidates to discuss planting requirements necessary for the successful germination of beans. Some candidates provided confused responses to this part of the question in that they discussed the requirements for successful germination of beans.

#### **Question 5**

This question tested the candidates' knowledge and comprehension of the effects of weeds on plant growth as well as their understanding of the advantages and disadvantages of chemical weed control.

Responses to this question were fairly well done, with most candidates demonstrating an above average understanding of weeds and their effects on crop growth, as well as chemical weed control.

#### **Question 6**

This question tested candidates' knowledge of disease, causative agents, symptoms, affected crops and methods of controlling pest and disease.

Most candidates displayed competence on the parts of the question that dealt with methods of controlling pests and diseases. However, candidates found it challenging to name the pest and disease and name the crops affected by the disease.

Some common incorrect responses to the symptoms of nematode disease were fungus, earthworm, blight and virus.

#### **Question 7**

Candidates were required to:

- define the concepts "Feed Conversion Ratios" and "Balanced Ration"
- identify management information provided by the "Feed Conversion Ratio"
- select the group of animals with the best "Feed Conversion Ratio" from a given set of groups and
- explain the economic importance of the "Feed Conversion Ratio".

Generally candidates' responses to this question were very poor. Candidates displayed a lack of understanding of the specific technical content tested. In conclusion therefore, it is necessary that agriculture content must be reinforced by practical activities and thorough observations during candidates' instructional exercise.

#### **Question 8**

The question was a three-part question in which Parts (a) and (b) intended to test candidates' knowledge of aquaculture (fish farming) and Part (c) tested candidates' knowledge on care of broiler chicks.

Generally, the responses to the question were good especially Parts (b) and (c).

Part (a) was not very well done because many candidates confused the concept of "aquaculture" with "apiculture".

### **Question 9**

This question provided candidates with a diagram of a poultry house. Part (a) of this question required the purpose of the house. Parts (b) and (c) tested candidates' basic knowledge on the roof of the house and Part (d) tested candidates' knowledge of the importance of the foot bath.

The question was a high response question indicating that candidates found the question interesting and generally provided correct responses.

Part (a) of the question proved most challenging to the candidates and there was general confusion as to the purpose of the house and the most suitable roof for broiler house.

### **Question 10**

Candidates were asked to define and differentiate the popular animal science terms namely: gestation, parturition, oestrus and oestrous cycle. Part (b) tested candidates' practical knowledge based on their experiences in the laboratory Candidates were requested to name the food or feed fed; their observation and the results achieved after particular food tests were carried out in the laboratory.

Part (b) was fairly done with a high percentage of the candidates correctly responding to the question.

Part (a) was very poorly answered: oestrous cycle was confused with oesophagus, digestion and excretion; gestation was confused with digestion, fertilization and castration; parturition was confused with weaning.

## **PAPER 03**

### **OPTION A – Crops and Soils**

### **Question 1**

Part (a) of this question tested candidates knowledge of photoperiodism, and required them to give examples of plants which respond to it. Part (b) of the question asked candidates to describe two methods of fertilizer application to crops and for each method to give an example of crops to which fertilizer is applied. In Part (c) candidates were asked to explain three methods by which organic manure improves soil fertility; three ways in which soil fertility may be affected by waterlogged conditions and three benefits of applying lime to soil.

This was a high response question which candidates answered satisfactorily. In Part (a) of the question candidates' knowledge of photoperiodism was limited and candidates were unable to give a proper explanation. As a result examples cited were roughly guess work with correct example limited to sorrel.

It is evident that agricultural terms and examples need revisiting and candidates must be provided with the situation to understand and obtain relevant concepts.

Part (b) of the question was also well answered, as candidates were aware of fertiliser application. However, candidates experienced some difficulties in the identification of examples, especially when fertiliser was applied by the broadcasting method. This could be because as candidates did not understand the various application techniques to which they referred.

In Part (c), candidates failed to explain how soil fertility may be affected by waterlogged conditions. Many candidates confused waterlogged conditions with irrigation of crops. However, most candidates knew the benefits of organic manure in improving soil fertility, for example, by increasing soil water holding capacity, aeration of the soil and so on. In the case of the benefits of applying lime to soil many candidates were only aware that the application of lime improved soil acidity and very few knew that lime supplied calcium ions to the soil.

### **Question 2**

This question tested candidates' knowledge of vegetative propagation. Candidates were first required to list techniques used in the vegetative propagation of ornamental plants and then to describe advantages of vegetative propagation. The second part of the question asked candidates to advise to a farmer on inadequacies in (i) land preparation and (ii) selection and treatment of planting materials as they applied to the farmer who experienced poor yield for her yam crop.

Candidates had no difficulty in identifying the techniques required for vegetative propagation of anthuriums. Similarly, most candidates were able to give at least one advantage of vegetative propagation.

Part (b) was not well answered as most candidates responded using generalizations where specific advice was asked for in each case. The knowledge of land preparation techniques was adequate but there was marked inadequacy in the Use of Knowledge as it applied to the selection and treatment of planting materials.

### **Question 3**

In Part (a) of this question, candidates were asked to define the term 'land capability classes.' They were also required to list four land capability classes and describe one characteristic of each land capability class identified. In Part (b), candidates were asked to discuss three management practices that must be done during each of the following time periods: (i) January to May and (ii) June to September.

There was a satisfactory response to this question. Candidates were able to identify and/or describe the land capability classes. In a few cases candidates were confused by the term land capability classes.

On the other hand difficulties emerged among candidates to explain management practices that must be done especially for the period of June to September. Furthermore, candidates did not recognize specific crops best suited for a particular rainfall zone, and as such were unable to elaborate on the relevant associated practices for each rainfall zone.

The problem seemed to be one of comprehension. Candidates were unable to apply information which should have been adequately covered in the syllabus. The responses showed general confusion in farming practices to suit particular rainfall conditions.

### **Question 4**

Part (a) of this question required candidates to name four activities involved in the preparation of a seedbed for seedling production. Part (b) requested candidates to name two types of mediums used in the cultivation of anthuriums and to explain two benefits of the use of shade when cultivating anthuriums. In Part (c), candidates were required to discuss three types of insect damages and in Part (d), three ways in which farmers can reduce the use of chemical pesticides when cultivating crops.

The responses obtained from candidates were generally good. Parts (a) and (b) were widely known by candidates. Candidates were au courant with the activities involved in seedbed preparation and medium used in the cultivation of anthuriums and the benefit of shade in the cultivation of anthuriums.

Many candidates attempted Part (c) and the question was reasonably well answered with candidates correctly identifying methods of insect attacks as piercing and sucking; biting and chewing; boring and tunnelling. However, some very vague responses were received such as eating leaves and damaged stems.

## **OPTION B - Animal Science**

### **Question 1**

Part (a) (i) required candidates simply to define upgrading, culling and artificial insemination. Most candidates across the region were quite familiar with these terms and their performance was fair. Few candidates correctly gave the removal of unproductive animals as the definition for culling.

Part (b) of the question, which required candidates to name three breeds of dairy animals recommended for use in an artificial insemination programme was not very well done. Actually, candidates had difficulty in identifying at least one breed.

Part (c) (i) of the question required candidates to discuss three advantages to be derived from the use of artificial insemination. This part of the question was very well done. However, some candidates gave inappropriate disadvantages as it is expensive; poor heat detection meant that artificial insemination could not be done.

Part (c) (ii) required candidates to discuss three conditions necessary for the success of an artificial insemination programme. This part of the question was poorly answered as the candidates misinterpreted the question.

Overall candidates' performance on this question can be described as satisfactory.

### **Question 2**

Part (a) of the question provided a table with various classes of livestock. Candidates were required to indicate the length of gestation period of the animals. This part of the question proved challenging to some candidates. However, generally candidates' responses were mainly accurate.

Part (b) of the question was well done. This part of the question asked candidates to identify two characteristics of each grazing system used in rearing cattle in the Caribbean.

Part (c) of the question requested candidates to describe five principles governing the housing requirements for layers. Many candidates correctly stated the housing requirements for layers and their advice for rearing layers were accurate. However, some candidates did not read the question carefully and spoke about broiler production.

### **Question 3**

Parts (a) and (b) of the question required candidates to define the term 'apiculture' and to explain two ways in which bees are of economic importance to agriculture. This topic was very popular with candidates from around the region, not only did most answer the question, but most also answered it well.

Part (c) of the question required candidates to name three factors that must be considered in the marketing of honey. This was also a very popular question with the candidates. However, from the response given the question definitely posed the greatest difficulty for candidates. Many candidates even misinterpreted the question and discussed the production of honey.

Part (d) of the question concerned factors that must be considered in the selection of a site for the establishment of an apiary. Candidates were presented with a simple situation and were required to construct a response based on the situation presented. This topic was also popular with candidates and their performance in answering the question was average.

#### **Question 4**

The question required candidates to propose a model livestock industry which focuses on the production of healthy animals. The proposal should (i) outline two management practices considered critical to the health of animals and (ii) identify six signs that would suggest an animal is healthy. In Part (b), candidates were required to discuss five measures that can be used to improve the health of farm animals.

Part (a) of this question was done fairly well by candidates. Most candidates were able to identify sanitation, housing and feeding as important. Furthermore, candidates were very familiar with signs of ill-health and correctly listed weight loss, loss of appetite, diarrhoea, fever and constipation.

Part (b) of this question was done fairly well by candidates and many candidates were very familiar with this topic.