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JANUARY 2025

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

HUMAN AND SOCIAL BIOLOGY

Paper 02 – General Proficiency

2 hours

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READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of SIX questions in TWO sections.
2. Answer ALL questions.
3. Do NOT write in the margins.
4. Write your answers in the spaces provided in this booklet.
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.**

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SECTION A

Answer ALL questions.

1. (a) (i) Define the term 'balanced diet'.

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(2 marks)

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(ii) Identify the component in a balanced diet that CANNOT be digested.

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(1 mark)

(iii) Anorexia and bulimia are two common eating disorders.

State ONE similarity and ONE difference between anorexia and bulimia.

Similarity

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Difference

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(3 marks)

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(b) Figure 1 and Figure 2 show the nutrition facts labels of two snacks, A and B. Study the information provided in each label and answer the questions that follow.

Nutrition Facts

Serving Size	**3 sections (116 g)**
Amount Per Serving	
Calories	**135**
	% Daily Values*
Total Fat 0.56 g	**1%**
Saturated Fat 0.137 g	**1%**
Trans Fat	
Polyunsaturated Fat 0.106 g	
Monounsaturated Fat 0.209 g	
Cholesterol 0 mg	**0%**
Sodium 4 mg	**0%**
Total Carbohydrate 35.19 g	**13%**
Dietary Fibre 3.7 g	**13%**
Sugars 30.64 g	
Protein 1.06 g	
Vitamin D 0.00 mg	**0%**
Calcium 21 mg	**2%**
Iron 0.27 mg	**1%**
Potassium 323 mg	**7%**
Vitamin A 79 mg	**9%**
Vitamin C 57.3 mg	**64%**

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2 000 calories a day is used for general nutrition advice.

Figure 1. Snack A

Nutrition Facts

Serving Size	**3 sections (43 g)**
Amount Per Serving	
Calories	**230**
	% Daily Values*
Total Fat 14.00 g	**18%**
Saturated Fat 8.000 g	**40%**
Trans Fat 0.000 g	**0%**
Cholesterol 10 mg	**3%**
Sodium 35 mg	**2%**
Total Carbohydrate 26.00 g	**9%**
Dietary Fibre 0.0 g	**0%**
Sugars 34.00 g	
Protein 2.00 g	
Vitamin D 0.000 g	**0%**
Calcium 0.000 g	**0%**
Iron 0.000 g	**0%**
Potassium 0.000 g	**0%**

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2 000 calories a day is used for general nutrition advice.

Figure 2. Snack B

(i) Suggest which of the two snacks, A or B, is the healthier option.

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(1 mark)

(ii) State FOUR reasons to justify your response in (b) (i).

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(4 marks)

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(c) In the Caribbean, it is recommended that individuals consume a diet consisting of foods from each of the six Caribbean food groups.

(i) Recommend TWO Caribbean food groups from which a labourer should consume higher amounts in order to ensure good health.

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(2 marks)

(ii) State ONE reason for EACH recommendation made in (c) (i).

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(2 marks)

Total 15 marks

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2. (a) (i) State the difference between 'excretion' and 'elimination'.

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(2 marks)

(ii) Other than the kidney, name the TWO excretory organs in the body and state ONE excretory product from EACH named organ.

Organ .....

Excretory product .....

Organ .....

Excretory product .....

(4 marks)

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(b) Figure 3 shows a diagram of a nephron of a kidney.

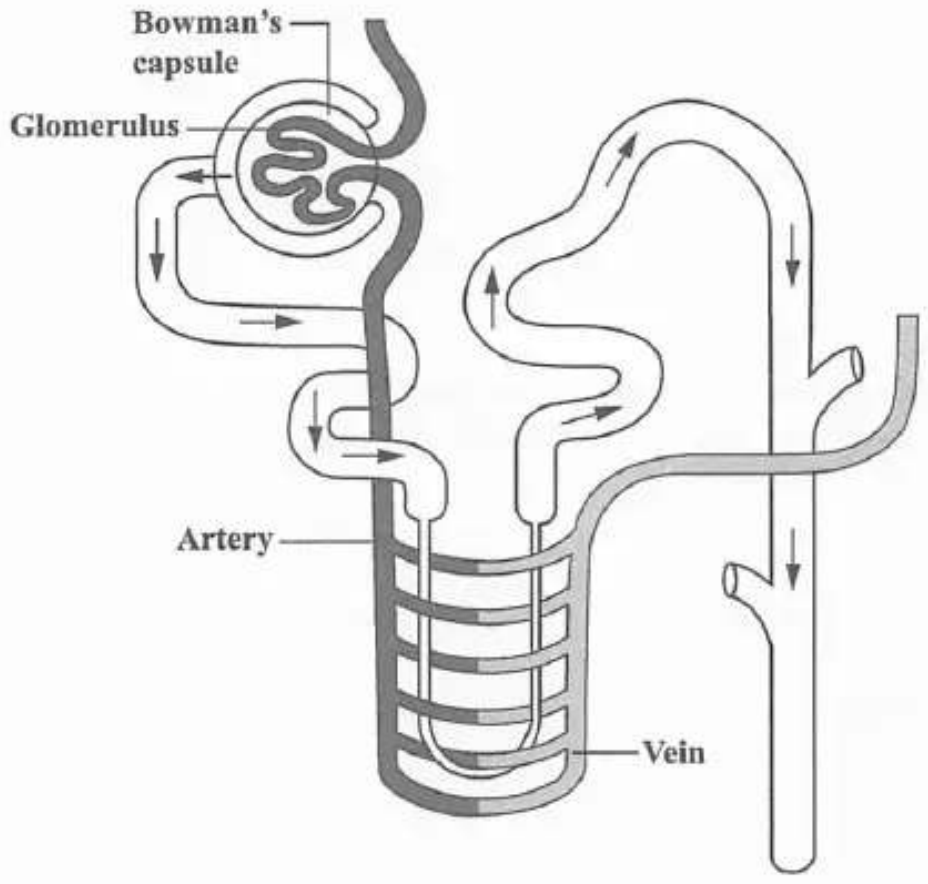


Figure 3. Nephron of a kidney

Blood is filtered from the glomerulus and the filtrate enters the Bowman's capsule.

List, **in the correct order**, the FOUR structures after the Bowman's capsule through which the filtrate will pass as urine is being formed.

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(3 marks)

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(c) Table 1 shows the concentration of three substances found in the filtrate and urine of a healthy individual.

TABLE 1: CONCENTRATION OF THREE SUBSTANCES FOUND IN THE FILTRATE AND URINE OF A HEALTHY INDIVIDUAL

Substance	Concentration (g/cm^3)	
	Filtrate in Bowman's Capsule	Urine
Urea	0.5	15.0
Glucose	4.0	0.0
Protein	0	0

(i) Explain why glucose is found in the filtrate but not in the urine.

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(4 marks)

(ii) Explain why protein is found in neither the filtrate nor the urine.

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(2 marks)

Total 15 marks

3. (a) State TWO ways in which genetic variation occurs in living organisms.

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(2 marks)

(b) Complete the following paragraph by inserting the correct word from the list of words provided below.

disadvantageous	**artificial selection**	**parents**	**natural selection**
generation	**adapt**	**favourable**	**yield**

The process where organisms with ..... traits are more likely to reproduce is called ..... . These traits are passed to the next ..... . Over time this process allows organisms to ..... to their environment. **(4 marks)**

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(c) Figure 4 shows a picture of five children with different characteristics.



Figure 4. Five different children

(i) Identify TWO examples of continuous variation that can be observed in Figure 4.

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(2 marks)

(ii) Identify the example of discontinuous variation in Figure 4.

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(1 mark)

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4. (a) Study the equation below and answer the questions that follow.

$$6H_2O + 6CO_2 \xrightarrow{\text{light}} C_6H_{12}O_6 + 6O_2$$

(i) Name the process represented by the equation above.

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(1 mark)

(ii) State the function of the process represented by the equation above.

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(1 mark)

(iii) Identify the cell organelle in which the process represented by the equation above occurs.

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(1 mark)

(iv) Identify the pigment responsible for capturing light in the process shown in the equation above.

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(1 mark)

(v) State the name of EACH of the products shown in the equation above.

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(2 marks)

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(b) Explain how EACH of the products shown in the equation **on page 13** is critical to the survival of other organisms.

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(4 marks)

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(c) An agricultural engineer is developing two different varieties of sweet potato, A and B, as shown in Figure 5 and Figure 6.

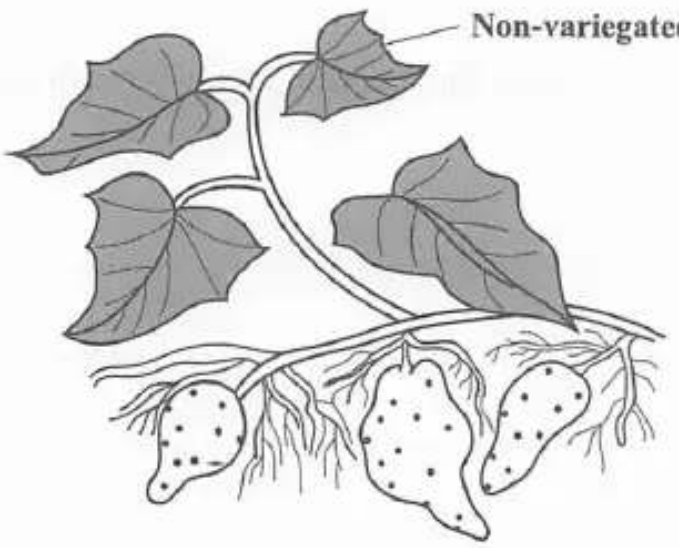


Figure 5. Variety A

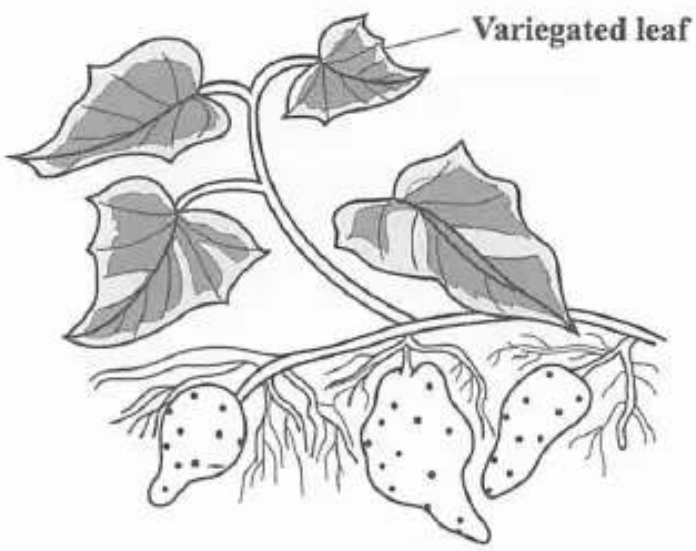


Figure 6. Variety B

(i) Explain which variety, A or B, is likely to produce a greater yield of sweet potato.

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(4 marks)

(ii) Suggest the test the engineer would have to conduct to confirm the major food group found in the sweet potatoes.

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(1 mark)

Total 15 marks

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SECTION B

Answer ALL questions.

5. During the rainy season, governments are very concerned about the spread of vector-borne diseases.

(a) Define the term 'vector'.

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(2 marks)

(b) (i) Name ONE mosquito-borne disease that is common in the Caribbean.

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(1 mark)

(ii) Describe how the disease named in (b) (i) is transmitted.

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(2 marks)

(iii) State ONE sign **or** symptom of the disease named in (b) (i).

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(1 mark)

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(c) Compare and contrast the life cycle of a mosquito with that of a housefly.

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(5 marks)

(d) Recommend FOUR ways in which communities and governments can reduce the transmission of diseases by mosquitos and houseflies.

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(4 marks)

Total 15 marks

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6. Figure 7 shows various processes labelled A–E that occur in the water cycle.

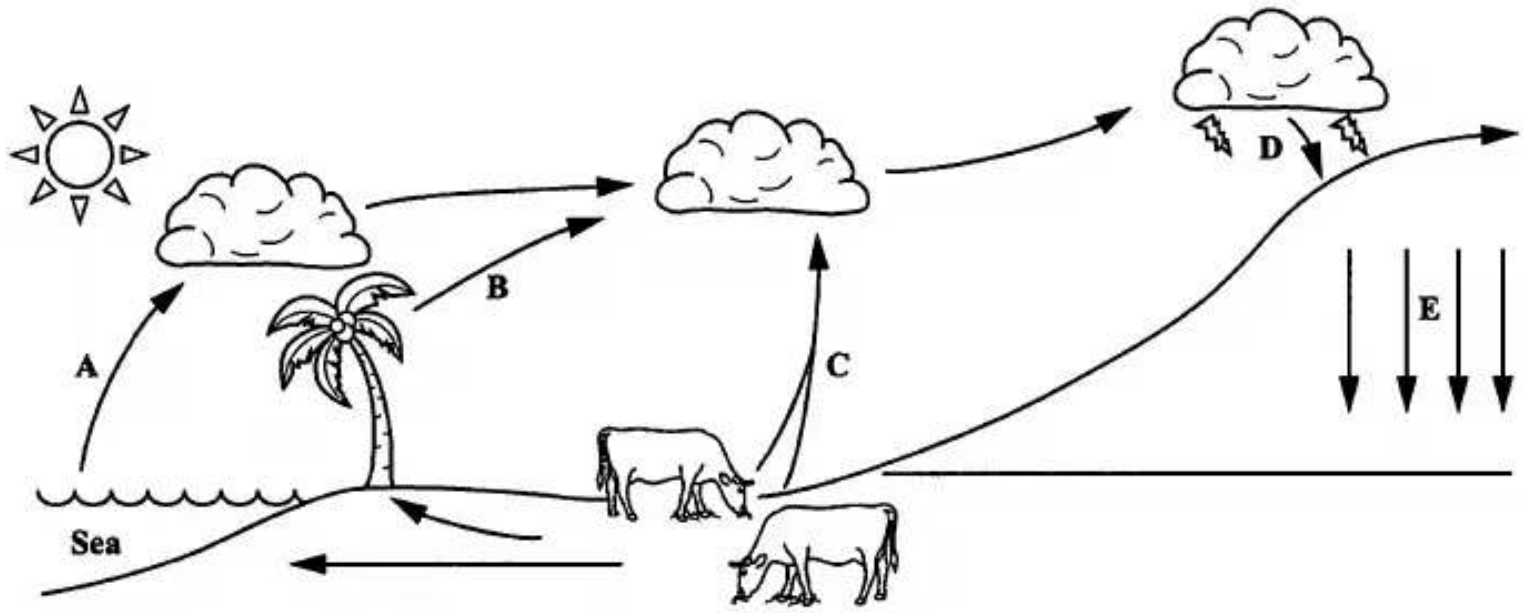


Figure 7. Water cycle

(a) Identify any THREE of the labelled processes in Figure 7. The letter labels must be included in your response.

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(3 marks)

(b) List THREE ways in which water can be purified in the home.

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(3 marks)

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(c) Figure 8 and Figure 9 are graphs which show sources of pollutants at two different locations, X and Y.

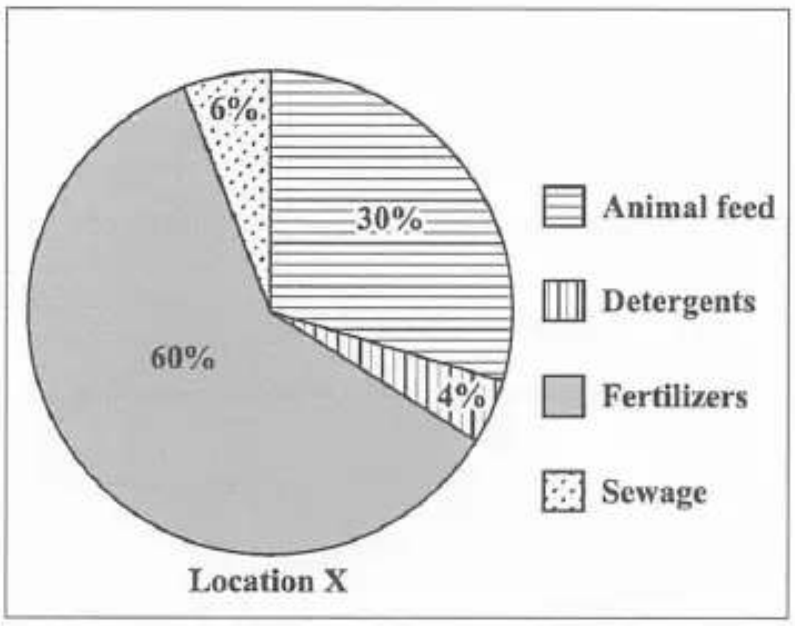


Figure 8. Source of pollutants at Location X

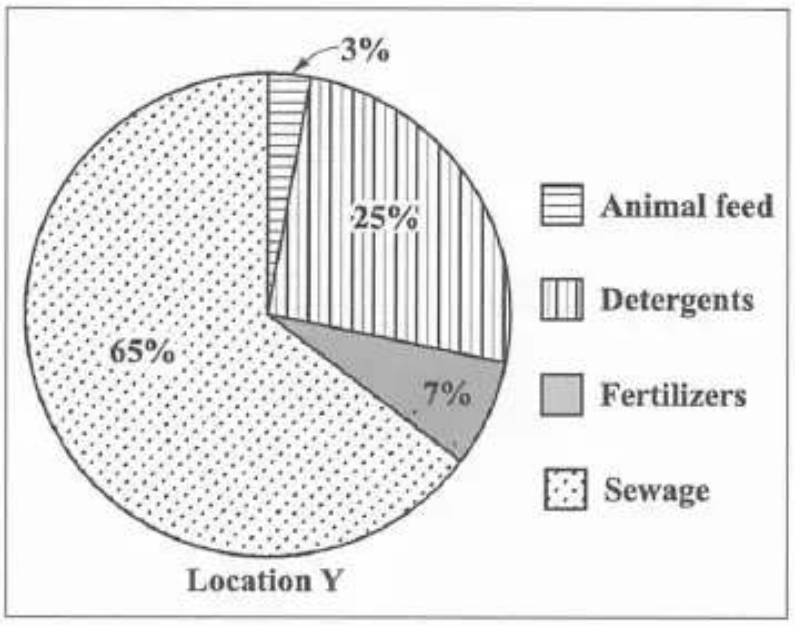


Figure 9. Source of pollutants at Location Y

(i) Suggest the type of land use that is occurring at Location X and Location Y.

Location X .....

Location Y .....

(2 marks)

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(ii) Explain TWO social and/or economic effects that can occur if the pollutants from Location X and Location Y were to enter the waterways.

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(4 marks)

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(iii) Recommend THREE strategies that could be employed to reduce the pollutants from Location X and Location Y.

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(3 marks)

Total 15 marks

END OF TEST

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

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