TEST CODE **01230020**

FORM TP 2007100

MAY/JUNE 2007

CARIBBEAN EXAMINATIONS COUNCIL

SECONDARY EDUCATION CERTIFICATE EXAMINATION

INTEGRATED SCIENCE
(Single-Award)

General Proficiency

Paper 02

2 hours

READ THE FOLLOWING DIRECTIONS CAREFULLY

1. You MUST use this answer booklet when responding to the questions. For EACH question, write your answer in the space indicated and return the answer booklet at the end of the examination.

2. This test is divided into TWO sections. Each contains THREE questions. You should answer ALL SIX questions.

3. You are advised to spend about one hour on each section.

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

Copyright © 2006 Caribbean Examinations Council ®
All rights reserved.

SECTION A

You should answer ALL THREE questions.
(Suggested time: 60 minutes)
You are advised to spend about 20 minutes on EACH question.

1. (a) Table 1 shows the increase in height over a twelve-week period of the stems of two bean plants, A and B, that grew from dry seeds. The seeds were planted in two different locations.

TABLE 1: HEIGHT OF STEMS

Week	Height (cm)	
	Plant A	Plant B
0	0	0
2	10	5
4	30	15
6	50	21
8	80	32
10	90	45
12	90	45

(i) Using the data in Table 1 and **the same axes** on the grid provided in Figure 1, plot TWO graphs to compare the increase in height of the two bean plants over the twelve-week period. **(5 marks)**

TITLE: _____

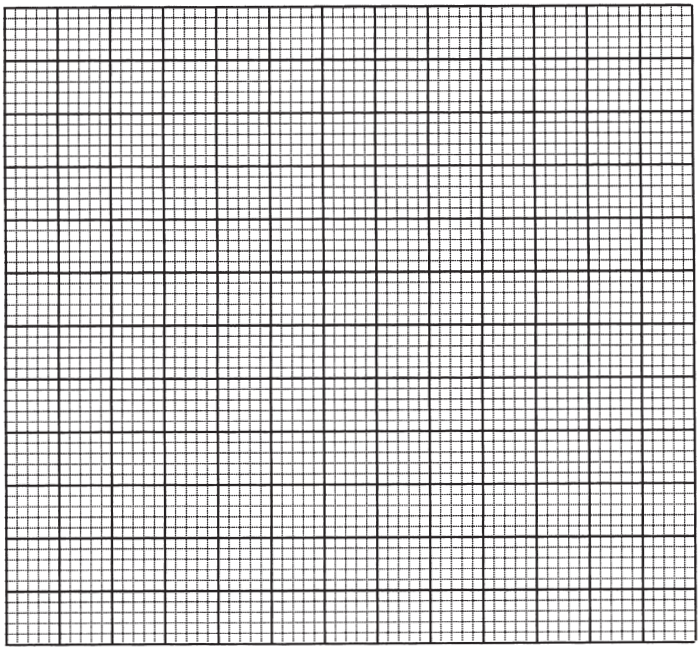


Figure 1.

(ii) Write an appropriate title above your graph in Figure 1. **(1 mark)**

(b) (i) After how many weeks did Plant B stop increasing in height?

_____

(1 mark)

(ii) Which of the two plants shows the faster rate of growth?

_____

(1 mark)

(iii) State TWO conditions that might cause the faster rate of growth in the plant selected in (b) (ii) above.

_____

_____

(2 marks)

(iv) How would ONE of the conditions you mentioned in (b) (iii) above cause an increase in the rate of growth?

_____

_____

(1 mark)

(c) Figure 2 is a diagram of a bean seedling.

(i) Label Parts A and B on the diagram.

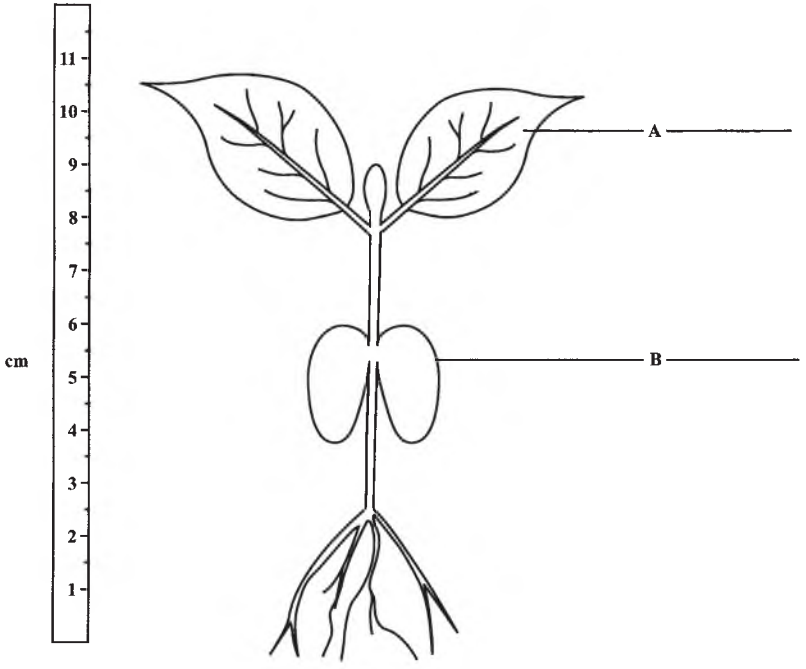


Figure 2. A bean seedling

(2 marks)

(ii) Using the ruler at the left side of the diagram in Figure 2, measure and record the length of the stem.

Length of stem: _____

(2 marks)

Total 15 marks

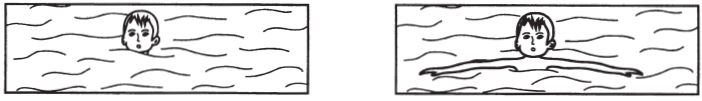
2. (a) Name the TWO water-safety devices which make it easier for a person to float in the sea or in the pool.

_____

_____

(2 marks)

(b) The pictures, A and B, in Figure 3 show a learner floating in two different types of water.



A **B**

Figure 3. Learner floating

(i) In which picture, A or B, in Figure 3, is the learner floating in sea water?

_____

(1 mark)

(ii) Give ONE reason for your answer in (b) (i) above.

_____

(1 mark)

(c) Swimming is an aerobic activity. What does 'aerobic' mean?

_____

(1 mark)

(d) During a competition meet, two swimmers were disqualified for using unethical performance enhancement techniques. One of these techniques was blood boosting.

(i) Name ONE other technique used for performance enhancement.

_____

(1 mark)

(ii) Explain how ANY ONE of the techniques in (d) above could increase the performance of the swimmers.

_____

_____

_____

_____

_____

(2 marks)

(iii) Why are the techniques considered to be unethical?

_____

_____

_____

_____

(1 mark)

(iv) Suggest to the swimmers TWO ways in which they can improve their performance without using unethical techniques.

_____

_____

(2 marks)

(v) Name ONE food nutrient which should be part of the swimmer's diet.

_____

(1 mark)

(vi) Give ONE reason for your answer in (d) (v) above.

_____

_____

(1 mark)

(e) The swimmers are advised not to eat a heavy meal before a race.

Explain why this advice is given.

_____

_____

_____

_____

(2 marks)

Total 15 marks

3. (a) (i) What is a 'hormone'?

_____

_____

(1 mark)

(ii) Give TWO examples of hormones.

_____

_____

(2 marks)

(b) Joseph, a male patient, and Karen, a female patient, are consulting a doctor for problems which they are having with their endocrine systems. Joseph's urine is tested for the presence of glucose. The result is positive. Karen is 18 years old but has not yet developed breasts and has not yet had a menstrual period.

(i) For EACH patient, state which secretory/endocrine organ has malfunctioned and is causing the symptom(s). Explain why each patient is experiencing the particular symptom(s).

Joseph's malfunctioning organ is his _____ .

Reason for symptoms: _____

_____

_____

(3 marks)

Karen's malfunctioning organ is her _____ .

Reason for symptoms: _____

_____

_____

(3 marks)

(ii) To control his symptoms, Joseph must decrease the intake of ONE food nutrient.

Suggest which food nutrient must be decreased.

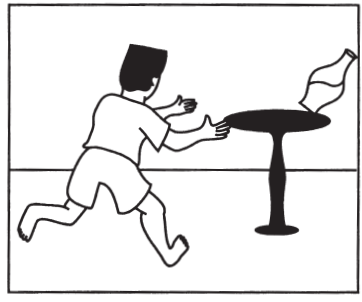
_____

(1 mark)

(c) Figure 4 shows two responses of the nervous system.



A



B

Figure 4. Two responses of the nervous system

(i) What is a 'reflex action'?

_____

_____

(1 mark)

(ii) In which of the pictures, A or B, in Figure 4 is a reflex action MOST likely occurring?

_____

(1 mark)

(iii) Give ONE reason for your choice in (c) (ii).

_____

_____

_____

_____

(2 marks)

(iv) Name the sense organ being used in the response at B in Figure 4.

_____

(1 mark)

Total 15 marks

SECTION B

You should answer ALL THREE questions.
(Suggested time: 60 minutes)

You are advised to spend about 20 minutes on EACH question.

4. (a) State TWO chemical and TWO physical properties of water.

Chemical properties:

_____

_____

_____

(2 marks)

Physical properties:

_____

_____

_____

(2 marks)

(b) (i) Name TWO processes which the local water company uses to purify the water to ensure that clean water reaches the homes.

Process 1: _____

Process 2: _____

(2 marks)

(ii) How does EACH process mentioned in (b) (i) help to purify the water?

Process 1: _____

Process 2: _____

(2 marks)

(c) Figure 5 shows a section of a riverside. Beside it is a small farming area and a factory. The farmers often find dead fish near the river bank.

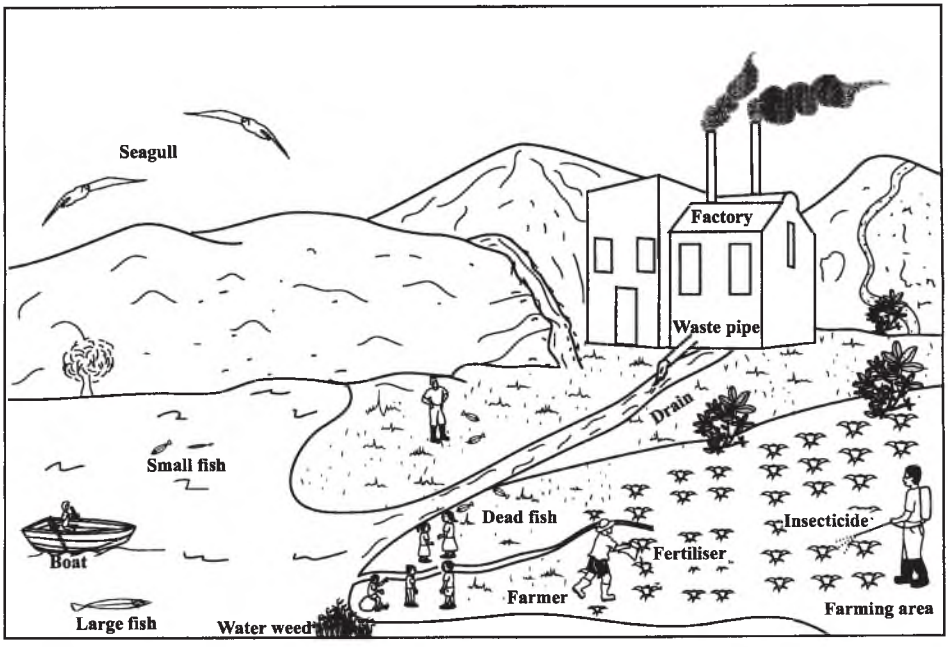


Figure 5. Riverside

(i) Use FOUR of the organisms shown in Figure 5 to draw a food chain.

(2 marks)

(ii) Identify ONE activity on the farm shown in Figure 5 that could have a negative effect on the river.

_____

_____

(1 mark)

(iii) How does the activity mentioned in (c) (ii) above result in the negative effect?

_____

_____

_____

(1 mark)

(iv) Identify ONE activity of the factory shown in Figure 5 that could have a negative effect on the river.

_____

_____

(1 mark)

(v) How does the activity mentioned in (c) (iv) above result in the negative effect?

_____

_____

(1 mark)

(d) Why should the dead fish NOT be collected and sold?

_____

_____

_____

(1 mark)

Total 15 marks

5. (a) A bimetallic strip and a frame are presented in Figure 6.

The bimetallic strip is made of two different metals, A and B, riveted together. When the bimetallic strip is heated, A expands more than B.

In the frame provided in Figure 6, draw what the strip would look like when heated. Label A and B on your diagram.



Bimetallic strip

Diagram of the heated bimetallic strip

Figure 6.

(2 marks)

(b) A bi-metallic strip is used in the thermostat of an electric iron as shown in Figure 7. Metal A expands more than Metal B for the same change in temperature.

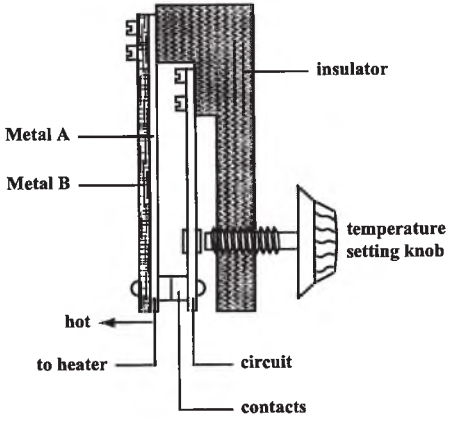


Figure 7. Thermostat of an electric iron

(i) What is a 'thermostat'?

_____

(1 mark)

(ii) Table 2 presents two stages explaining how the thermostat shown in Figure 7 works.

Complete Table 2 by writing the effect of EACH action indicated on the flow of electric current through the iron.

TABLE 2: HOW THE THERMOSTAT WORKS

Action	Effect
As current flows through the iron, the bimetallic strip is heated.	
The iron and strip cool down.	

(4 marks)

(c) (i) The hot iron is placed on a metal rest at one end of the ironing board and the metal becomes hot.

Suggest the method by which heat is transferred from the iron to the metal rest.

Method of transfer: _____

(1 mark)

(ii) The wax of an unlit candle standing near, but not touching the hot iron or metal rest, becomes soft.

Suggest the method by which heat is transferred from the iron to the candle wax.

Method of transfer: _____

(1 mark)

(d) What is meant by 'ventilation'?

_____

_____

(2 marks)

(e) During the rainy season, a family keeps all of their windows and doors closed for several days, resulting in poor ventilation of the house. The inside of the house has been recently painted.

Some of the negative effects they experienced are indicated in Table 3.

(i) Complete Table 3 to show the **specific** cause of EACH effect of poor ventilation.

TABLE 3: EFFECT AND CAUSE OF EFFECT

Effects Noticed	Possible Cause
Increased levels of mould and mildew	
Headaches	
Allergies/Respiratory problems	

(3 marks)

(ii) State ONE way in which the ventilation in the room might be improved.

_____

_____

(1 mark)

Total 15 marks

6. (a) What is a 'force'?

_____

_____

_____

(1 mark)

(b) Define EACH of the following:

(i) Gravitational force _____

_____

_____

(1 mark)

(ii) Frictional force _____

_____

_____

(1 mark)

(c) A student wishes to find the mass of a mango but there is no balance available. Her friend tells her that she could use the pieces of apparatus listed below to find its mass.

Metre rule	String
200g mass	Large, strong nail

(i) Explain how the student might use the pieces of apparatus as set up in Figure 8 to find the mass of the mango.

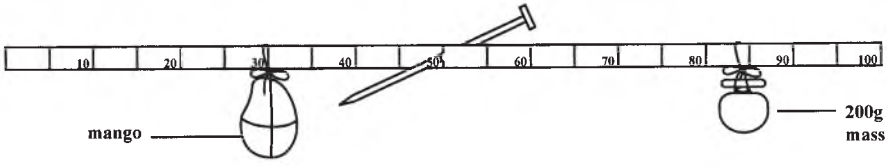


Figure 8. Finding mass of mango

_____

_____

_____

_____

_____

_____

_____

(4 marks)

(ii) How could the student use the results from (c) (i) above to find the mass of the mango?

_____

_____

_____

_____

(2 marks)

(d) What is a 'machine'?

_____

_____

(1 mark)

(e) The bottle opener in Figure 9 is a machine used in everyday life.

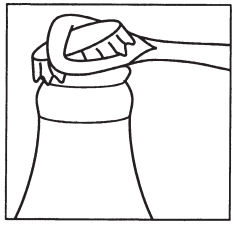


Figure 9. A simple machine

(i) Label Figure 9 to show the effort force (E), the fulcrum (F), and the load (L).
(3 marks)

(ii) Why is the bottle opener, used as shown in Figure 9, considered to be a machine?

_____

_____

(2 marks)

Total 15 marks

END OF TEST