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FORM TP 2008095

MAY/JUNE 2008

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.

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SECTION A

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

1. Three individuals, Samantha, Susan and Sharon, often carry out the activities depicted in Figure 1. Study Figure 1 and answer the questions which follow.

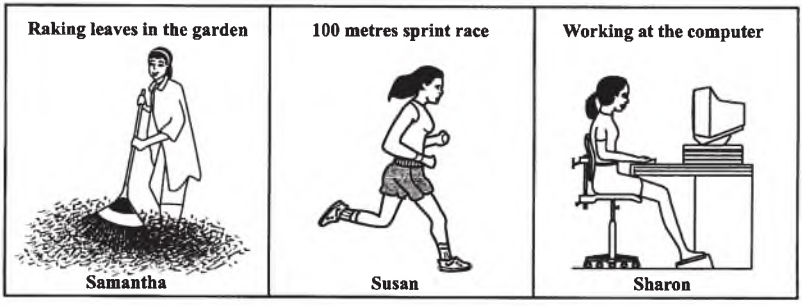


Figure 1. Working and sporting activities

(a) In the space provided below, sequence the individuals in order of the energy required by the individual's body when performing the activity depicted in Figure 1 for the same duration.

Most energy required ⟶ Least energy required

Individuals: _____ _____ _____

(2 marks)

(b) In which activity in Figure 1 would the individual have the **highest** breathing rate?

_____

(1 mark)

(c) Describe the chest movement expected during the activity to indicate the difference in breathing rate of EACH individual in Figure 1. Refer to the structures of the respiratory system in your response.

Samantha:

Breathing rate – _____

Chest movement – _____

(2 marks)

GO ON TO THE NEXT PAGE

Susan:

Breathing rate – _____

Chest movement – _____

(2 marks)

Sharon:

Breathing rate – _____

Chest movement – _____

(2 marks)

(d) (i) State ONE difference between 'aerobic' and 'anaerobic' respiration.

_____

_____

(1 mark)

(ii) In which activity in Figure 1 does anaerobic respiration play a significant role?

_____

(1 mark)

(iii) Why might anaerobic respiration be necessary for this activity?

_____

_____

(1 mark)

(iv) In Table 1, insert TWO likely differences between the air inhaled and exhaled by Susan during her activity shown in Figure 1.

TABLE 1. DIFFERENCES BETWEEN SUSAN'S INHALED AND EXHALED AIR

Inhaled air	**Exhaled air**

(2 marks)

(e) With reference to Susan's activity, give a reason for ONE difference in the inhaled and exhaled air.

Reason: _____

_____

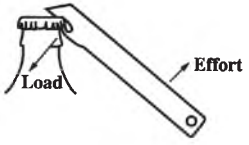
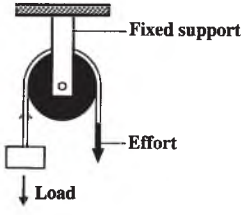
_____

(1 mark)

Total 15 marks

2. (a) Table 2 refers to simple machines. Complete Table 2 by describing the machine as a **pulley, lever or inclined plane** and state how the machine makes work easier.

TABLE 2: SIMPLE MACHINES

Machine	Type of Simple Machine	Ease in Work
		
		

(4 marks)

(b) Figure 2 shows four different classes of levers labelled A, B, C and D. Study Figure 2 and answer the questions which follow:

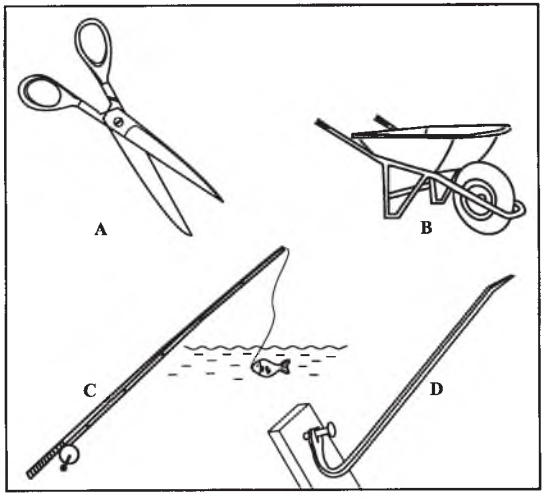


Figure 2. Different classes of levers

(i) Which lever is

a) second order? _____
(1 mark)

b) third order? _____
(1 mark)

(ii) Label lever D in Figure 2 to show the positions of the fulcrum (F), effort (E) and load (L). **(1 mark)**

(c) Figure 3 is a graph showing the performance of a simple machine. The mechanical advantage of the machine was measured for different loads. Study Figure 3 and answer the questions which follow.

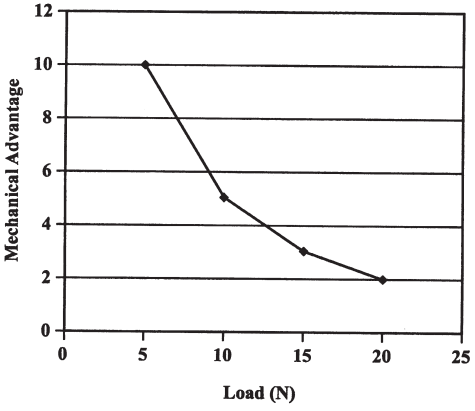


Figure 3. Graph showing mechanical advantage versus different loads

(i) From Figure 3, estimate the mechanical advantage for a load of 5N.

_____

(1 mark)

(ii) Calculate the effort applied for the load of 5 N.

(2 marks)

(iii) Describe the trend shown by the graph in Figure 3.

_____

_____

(2 marks)

(iv) Suggest a reason for this trend.

_____

_____

(1 mark)

(d) Poor maintenance practices may cause damage to machines and affect their efficiency. For the situation described below, suggest the effect on the machine and on its function.

Maya used a pair of scissors and forgot them by the sink in the kitchen.

(i) Effect on scissors:

_____

(ii) Effect on function of scissors:

_____

(2 marks)

Total 15 marks

3. People in a Caribbean country awoke to loud rumblings and saw red hot lava being emitted into the air.

(a) What natural disaster could have caused this?

_____

(1 mark)

(b) What is lava?

_____

_____

_____

_____

(2 marks)

(c) Many persons migrated from the area where the lava was emitted.

Suggest TWO possible reasons for this migration.

(i) _____

_____

(ii) _____

_____

(2 marks)

(d) State TWO precautions that the residents may adopt to protect themselves.

(i) _____

_____

(ii) _____

_____

(2 marks)

(e) Meteorologists in surrounding Caribbean islands have indicated that the dust present in the air of their countries came from the nearby natural disaster. Describe how this could have happened.

_____

_____

_____

_____

(2 marks)

(f) Suggest TWO ways in which the natural disaster can economically benefit the country in the long term.

(i) _____

_____

(ii) _____

_____

(2 marks)

(g) List TWO other natural disasters that have affected the Caribbean.

_____

_____

_____

(2 marks)

(h) List TWO features or environmental impacts of ONE of the natural disasters listed in (g) above.

_____

_____

_____

(2 marks)

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. Figure 4 shows Jerry playing a hop-scotch game. This game requires Jerry to place only one foot in a box where there is one box and one foot in each of two boxes when there are two boxes at the same level.

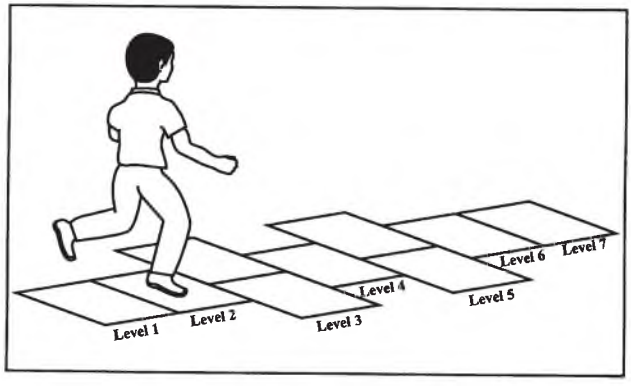


Figure 4. Hop scotch game

(a) Describe the role of EACH of the structures below in assisting Jerry to sucessfully jump from Levels 1 to 7 indicated in Figure 4.

(i) Brain:_____

_____

(2 marks)

(ii) Eyes:_____

_____

(2 marks)

(iii) Muscles:_____

_____

(2 marks)

(iv) Semi-circular canals:_____

_____

(2 marks)

(b) (i) At which level(s) of the game is Jerry likely to be MOST stable?

_____

(1 mark)

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

_____

_____

(1 mark)

(c) When Jerry heard the barking of dogs he ran from Level 3 to Level 7 and away from the game.

(i) Which hormone was likely to have enabled this response?

_____

(1 mark)

(ii) Describe TWO possible effects of the hormone in (c)(i) above on Jerry's body.

_____

_____

(2 marks)

(d) Which hormone

(i) will promote the development of facial hair as Jerry matures?

_____

(1 mark)

(ii) is necessary to control the amount of glucose in Jerry's blood?

_____

_____

(1 mark)

Total 15 marks

5. A marine biologist identified the following organisms in a river flowing through a village: large fish, small animals and larvae, algae and small plants, and small fish.

(a) Draw a food chain showing the feeding relationships among all of the organisms identified above.

(2 marks)

(b) Which of the organisms listed in (a) above can be identified as producers?

_____

_____

(1 mark)

(c) Some chemicals from a nearby factory accidentally entered the river and killed the small animals and larvae. State TWO effects this would have on the organisms in the river.

_____

_____

_____

_____

_____

(2 marks)

(d) What are TWO methods that can be used by the villagers to catch fish in the river?

_____

_____

(2 marks)

(e) (i) Could the same method of fishing used by the villagers in the river, be used by fishermen in the deep sea?

_____

(1 mark)

(ii) Provide TWO reasons for your answer in (e)(i) above.

_____

_____

_____

_____

(2 marks)

(f) John, a young villager, caught two live, small fishes and placed them in a bottle and covered it.

(i) What will happen to the fish after a while?

_____

_____

(1 mark)

(ii) Suggest a reason for your response in (f)(i) above.

_____

_____

_____

_____

_____

(1 mark)

(g) The villagers living near a polluted river have to use its water for domestic purposes. Describe how the sun can be used for making the water safe.

_____

_____

_____

_____

_____

(3 marks)

Total 15 marks

6. (a) In relation to playing surfaces, define 'friction' and 'bounce'.

(i) Friction: _____

_____

_____

(1 mark)

(ii) Bounce: _____

_____

_____

(1 mark)

(b) The graph in Figure 5 shows a comparison of the bounce and friction of four playing surfaces, A, B, C and D. Study Figure 5 carefully and answer the questions which follow.

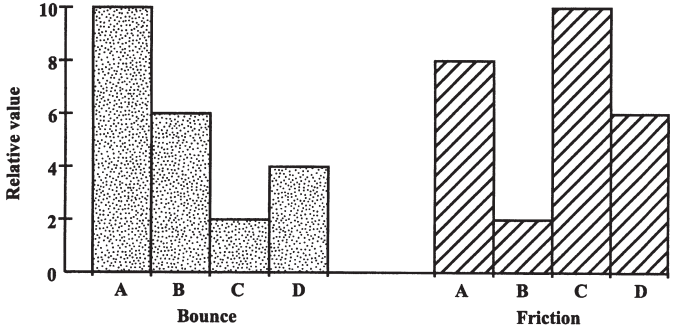


Figure 5. Properties of some playing surfaces

(i) Which of the surfaces, A, B, C or D, is the HARDEST?

_____

(1 mark)

(ii) Write a reason for your response in (i) above.

_____

_____

(2 marks)

(iii) Which of the surfaces, A, B, C or D, is the SMOOTHEST?

_____

(1 mark)

(iv) State a reason for your answer in (iii) above.

_____

_____

(2 marks)

(v) The materials used to make the four playing surfaces are wood, concrete, rubber and grass. From Figure 5, which of the surfaces, A, B, C or D, is likely to be rubber?

_____

_____

(1 mark)

(vi) Provide a reason for your answer in (v) above.

_____

_____

(2 marks)

(c) Figure 6 shows a footwear usually used for athletic sports. The materials used to make this shoe include cloth, plastic, leather and rubber.



Figure 6. Sport footwear

Study Figure 6 and complete Table 3 by inserting in the appropriate spaces the name of the shoe part (from Figure 6), the function of the shoe part and a suitable material for the shoe part.

TABLE 3: FEATURES OF A SPORT FOOTWEAR

Function of Shoe Part	Name of Shoe Part	Suitable Material for Shoe Part
Prevents skid		
	Midsole	

(4 marks)

Total 15 marks

END OF TEST