TEST CODE **01230020**

FORM TP 2010084

MAY/JUNE 2010

CARIBBEAN EXAMINATIONS COUNCIL

SECONDARY EDUCATION CERTIFICATE EXAMINATION

INTEGRATED SCIENCE
(Single-Award)

General Proficiency

Paper 02

2 hours

READ THE FOLLOWING DIRECTIONS CAREFULLY.

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

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

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

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

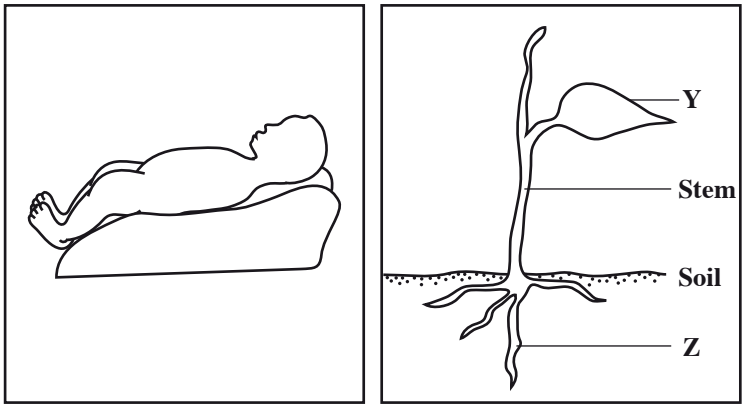
Copyright © 2009 Caribbean Examinations Council ®
All rights reserved.

SECTION A

Answer ALL THREE questions.
(Suggested time: 60 minutes)

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

1. In the diagram below, Figure 1A shows a sleeping child and Figure 1B a growing plant.



A. Sleeping child **B. Growing plant**

Figure 1. Two organisms

(a) State ONE reason for the transport system in the

(i) child _____
(1 mark)

(ii) plant. _____
(1 mark)

(b) Name TWO processes that are responsible for the movement of water at Y and Z in Figure 1B.

_____

_____
(2 marks)

(c) On the diagram above, use THREE arrows in EACH case to show how

(i) blood is circulated through the child's body in Figure 1A **(3 marks)**

(ii) water moves into and out of the plant in Figure 1B. **(3 marks)**

(d) Name the organ that pumps blood through the human body.

_____

(1 mark)

(e) On Figure 1A, place a point G at the possible centre of gravity of the sleeping child. **(1 mark)**

(f) Draw an arrow at G to show the direction of gravity on the body. **(1 mark)**

(g) State TWO features of the circulatory system that allow the blood to move from the child's leg to the heart.

_____

_____

_____

(2 marks)

Total 15 marks

2. Figures 2 and 3 show a dining room before and after dinner.



Figure 2. Before dinner



Figure 3. After dinner

(a) Name TWO household pests that may be present in the dining room if it is habitually left overnight as in Figure 3 and give a reason for the presence of these pests.

Pest 1: _____

Pest 2: _____

Reason: _____

_____

_____

_____

(3 marks)

(b) Describe ONE way in which the pests named in (a) affect humans.

_____

_____

_____

(2 marks)

(c) Give TWO methods for controlling household pests.

_____

_____

(2 marks)

(d) Mosquitoes are carriers of dengue fever in many Caribbean Countries. Figure 4 shows the Smiths' backyard. Identify ONE object which may encourage the breeding of mosquitoes.

_____

(1 mark)

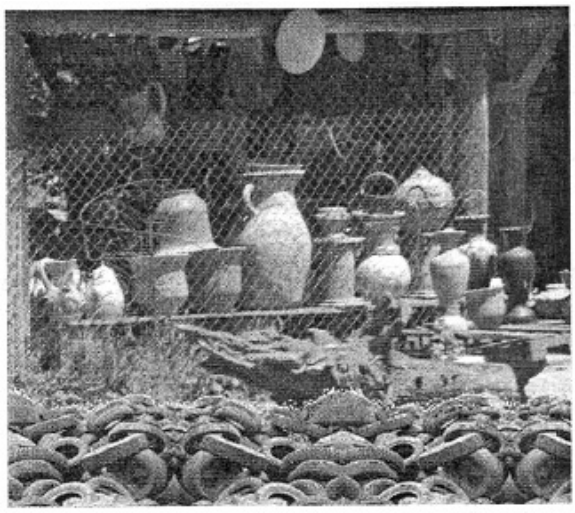


Figure 4. The Smiths' backyard

(e) There is no medicine to treat the virus that causes dengue fever. Suggest ONE way that the Smiths may assist in reducing the incidence of dengue fever.

_____

_____

(1 mark)

(f) Name TWO **other** diseases spread by mosquitoes.

_____

_____

(2 marks)

(g) Water from rainfall is collected from the roof in containers. Name TWO impurities that may be present in this water.

_____

_____

(2 marks)

(h) Suggest TWO ways by which Mrs. Smith can make the water collected in the containers safe for drinking.

_____

_____

(2 marks)

Total 15 marks

3. Sophia hopes to become a member of the national swimming team. Her coach encourages her to do weightlifting, aerobics and running.

(a) (i) What is the effect of weightlifting on the muscles of the body?

_____

(1 mark)

(ii) Suggest ONE benefit of aerobics and running that CANNOT be gained from weightlifting.

_____

_____

(1 mark)

(b) (i) The coach has recommended that Sophia eats more lean meats, peas, rice and sweet potatoes. What are the TWO food groups in her new diet?

_____

_____

(2 marks)

(ii) State ONE function of EACH of the food groups named in (b) (i) above.

_____

_____

_____

_____

(2 marks)

(c) Give ONE reason for EACH of the following:

(i) Sophia breathes faster when she is running.

_____

_____

(1 mark)

(ii) Sophia's heart beats faster when she exercises.

_____

_____

(1 mark)

(d) (i) Sophia's father, Mr. Pierre, decides to support her by joining in her exercises. Name ONE physical factor, other than fitness, which he must consider. Give ONE reason for your answer.

_____

_____

(2 marks)

(ii) After one month, the amount of fat around Mr. Pierre's waist decreased. Explain how this fat was used by his body.

_____

_____

(2 marks)

(e) Some athletes take performance enhancement drugs such as steroids which may result in their disqualification and ban from competition. What are THREE possible negative effects on Sophia's body if she uses steroids?

_____

_____

_____

_____

_____

(3 marks)

Total 15 marks

SECTION B

Answer ALL THREE questions.
(Suggested time: 60 minutes)

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

4. Figure 5 shows FOUR members of a group, Jeany, Sueling, Sammy and Fred, on a stage rehearsing for a concert.

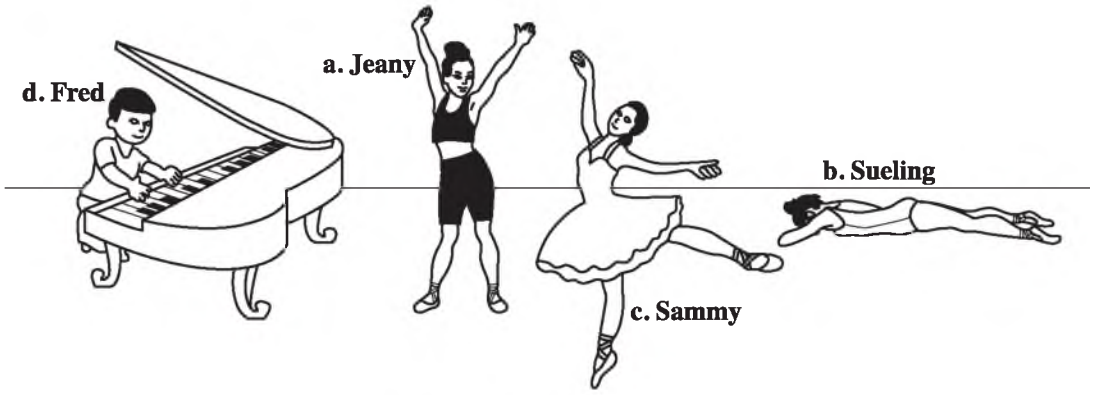


Figure 5. Members on stage

(a) Identify the group member with the MOST stable equilibrium and state TWO reasons for your answer.

Group member: _____

(1 mark)

Reasons: _____

_____

_____

(2 marks)

(b) Complete rows (i), (ii) and (iii) in Table 1 to show the correct stimulus, sense organ or major coordinating role during the rehearsal.

TABLE 1: STIMULUS, SENSE ORGAN AND COORDINATING ROLE

	Stimulus	Sense Organ	Major Coordinating Role
(i)	_____	Eye	Seeing others and objects to avoid collisions.
(ii)	Sound	Ear	_____
(iii)	Movement	_____	_____

(4 marks)

GO ON TO THE NEXT PAGE

(c) Energy occurs in different forms and is used in different ways. To carry out their activities, each group member requires energy. Explain how energy is obtained and used in producing their movements.

_____

_____

_____

_____

(2 marks)

(d) Label parts L and M on Figure 6, the internal structure of the eye shown below.

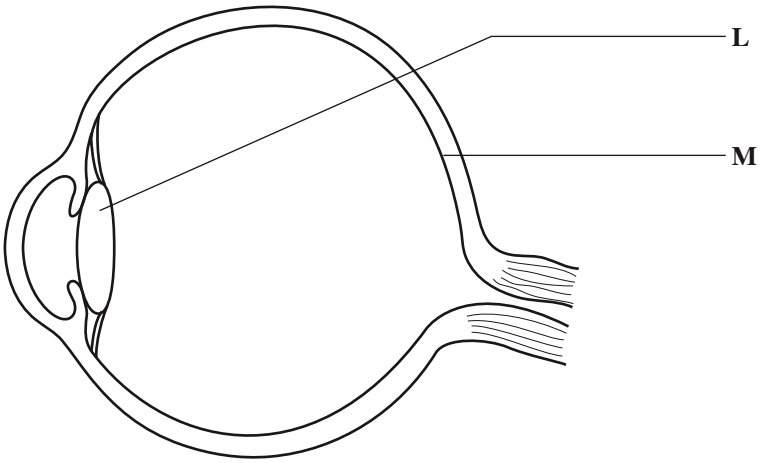


Figure 6. The internal structure of the eye

(2 marks)

(e) Jenny's grandmother holds the newspaper at arm's length when reading it.

(i) What is the most likely cause of this condition?

_____

(1 mark)

(ii) State TWO ways of correcting this defect.

_____

_____

(2 marks)

(f) While preparing for her examinations, Jenny has been reading late into the night. What is ONE precaution that she can take to prevent damage to her eyes?

_____

(1 mark)

Total 15 marks

5. Figure 7 shows the analog electricity meter of a household on 30 June 2008.

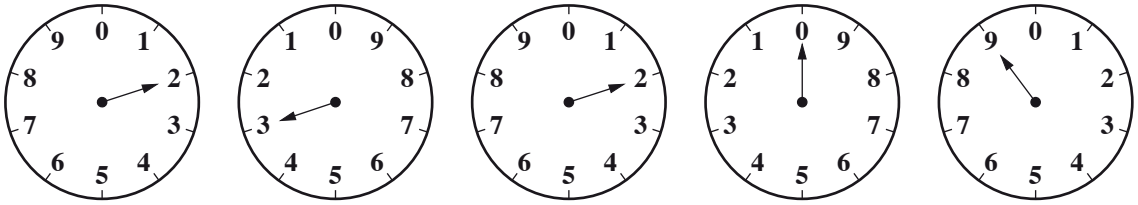


Figure 7. Diagram of an analog electricity meter

(a) (i) What is the function of an electricity meter?

_____

_____

(1 mark)

(ii) What is the reading on the meter shown in Figure 7?

_____

(1 mark)

(iii) The reading of the meter on 01 June 2008 was 22 943 kWh. Calculate the amount of electricity used during the month of June.

(1 mark)

(iv) The power company determines that the cost of electricity is 70 cents for every kWh of energy used. Calculate the cost of electricity for the month of June.

_____

_____

_____

_____

(2 marks)

(b) Table 2 below lists the wattage of some household items.

TABLE 2: WATTAGE OF HOUSEHOLD ITEMS

Item	Wattage	Time Used per Day (hours)	Energy Consumption/ (kWh per day)
Toaster	800	2	1.6
Refrigerator	900	24	(a) _____
Light bulb	75	12	0.9
Fan	100	6	0.6
Computer	250	4	1.0
Electric kettle	1300	(b) _____	3.9

(i) Complete Table 2 to show the missing values at (a) and (b). **(2 marks)**

(ii) State THREE measures which the family of this household can implement to reduce energy consumption.

_____

_____

_____

_____

_____

(3 marks)

(iii) Which of the following is the most cost effective: using the fan for twelve hours instead of six hours OR using the toaster oven for two hours? Explain your answer.

_____

_____

_____

_____

_____

_____

(2 marks)

(c) Distinguish between a 'switch' and a 'fuse'.

_____

_____

_____

_____

_____

(1 mark)

(d) Some homes in the Caribbean are powered by solar energy. State the energy changes that take place in these homes when an electric toaster oven is used.

_____

_____

_____

_____

_____

(2 marks)

Total 15 marks

6. (a) Explain the concept of the conservation of linear momentum.

_____

_____

_____

_____

_____

_____

(2 marks)

(b) Figure 8 shows a trolley of mass 20 kg, moving at a speed of 2 metres per second (2m/s). The trolley collides with a stationary toy truck of mass 10 kg.

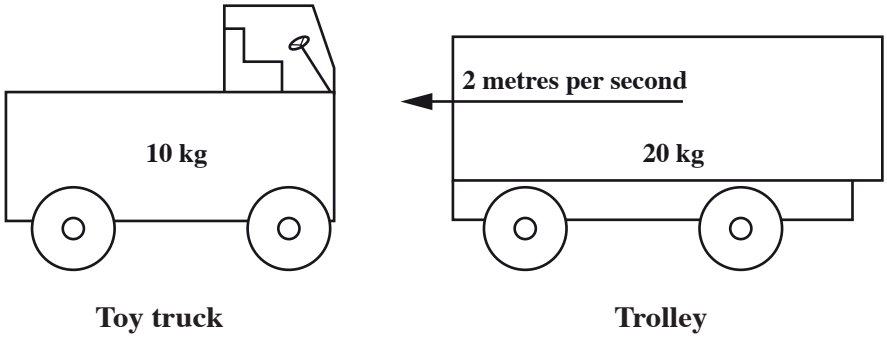


Figure 8. Diagram to show collision of a trolley with a truck

(i) State TWO possible results of this collision.

_____

_____

_____

_____

(2 marks)

(ii) Calculate the momentum of the truck if it was moving at a speed of four metres per second (4 m/s) towards the trolley.

_____

(1 mark)

(iii) State TWO possible results of the collision between the truck moving at the speed in (b) (ii) and the trolley.

_____

_____

_____

_____

_____

_____

(2 marks)

(c) (i) Define the term 'energy' and state the unit of energy.

Energy is

_____

The unit of energy is

_____

(2 marks)

(ii) What is the symbol for the unit of energy?

_____

(1 mark)

(d) State the forms of energy present (i) before, (ii) during and (iii) after the trolley collides with the stationary toy truck.

(i) Before

_____

_____

(ii) During

_____

_____

(iii) After

_____

_____

(3 marks)

(e) The toy truck possesses gravitational potential energy. Explain where this energy comes from.

_____

_____

_____

(2 marks)

Total 15 marks

END OF TEST