FORM TP 2015086

TEST CODE **01230020**

MAY/JUNE 2015

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

INTEGRATED SCIENCE
(Single Award)

Paper 02 – General Proficiency

2 hours 30 minutes

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of SIX questions in TWO sections.
2. Section A consists of FOUR questions. Answer ALL questions. Write your answers in the spaces provided in this answer booklet. Section A is worth 70 marks.
3. Do NOT write in the margins.
4. Section B consists of TWO questions. Answer ALL questions. Write your answers on the pages provided at the end of each question. Section B is worth 30 marks.
5. You may use a silent, non-programmable calculator to answer questions.
6. 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**.
7. **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.**

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

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SECTION A

Answer ALL FOUR questions.

1. Daniella and her family live on a very large farm. When Salisha visits the farm they go exploring to collect the smooth round pebbles found in the small stream running down the forested hillside. They notice that the water in the small ponds on the flat sandy fields dry up before similar ponds on the clayey hillside.

(a) (i) Give ONE reason why the ponds on the hillside dry up slower than those on the flat fields.

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(1 mark)

(ii) State TWO possible effects on the farm of cutting down the forest on the hillside.

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(2 marks)

(iii) Daniella recorded the following table in her journal.

TABLE 1: PREDATOR – PREY RELATIONSHIPS

Predator	Prey
Small birds	Insects, spiders and fruits
Hawks	Mice, small birds and seed-eating birds
Snakes	Mice, frogs and seed-eating birds
Insects	Leaves
Spiders	Insects
Mice	Seeds and fruits
Seed-eating birds	Grass seeds
Frogs	Insects

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Use the data from Table 1 to complete the food web in Figure 1 by drawing a MAXIMUM of **14** arrows in the appropriate places. **(4 marks)**

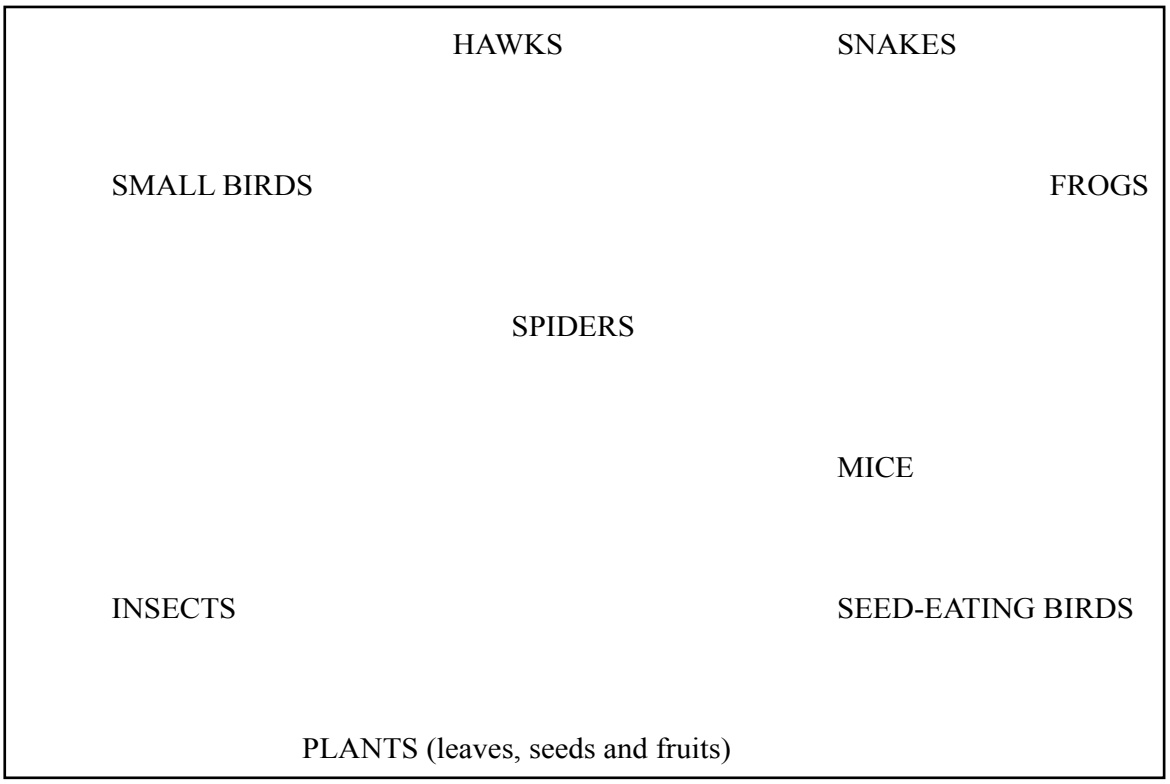


Figure 1. Food web

(iv) Name ONE herbivore, ONE carnivore and ONE omnivore in Table 1.

Herbivore .....

Carnivore .....

Omnivore .....

(3 marks)

(b) Plants make their own food and all living things use food to meet their energy needs.

(i) Name the process used by living things to obtain energy.

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(1 mark)

(ii) Name the process by which plants make food.

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(1 mark)

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(iii) Write a word equation for the process by which plants make food.

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(2 marks)

(iv) Name ONE form in which plants use nitrogen present in the soil.

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(1 mark)

(c) Samples of soil are taken at intervals in a straight line, across the fields 1–7 of the farm, from the lower limestone areas to the clay hill. The following is a table of the pH of the soil samples.

TABLE 2: pH OF SOIL SAMPLES ACROSS THE FARM

Field	1	2	3	4	5	6	7
pH of Soil Sample	8.2	7.6	7.0	6.5	6.0	5.4	5.0

(i) On the grid in Figure 2 on **page 5**, using the scales provided, plot a graph to represent the data in Table 2. **(4 marks)**

(ii) Draw on the graph the best straight line to show the trend. **(2 marks)**

(iii) Label the axes on the graph. **(1 mark)**

(iv) Suggest an appropriate title for the graph.

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(1 mark)

(v) If corn grows best in a neutral pH, use the graph to determine which is the most suitable field to be used as a corn field.

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(1 mark)

(vi) Use the graph to determine which field would be best for growing citrus plants which flourish in acidic soils.

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(1 mark)

Total 25 marks

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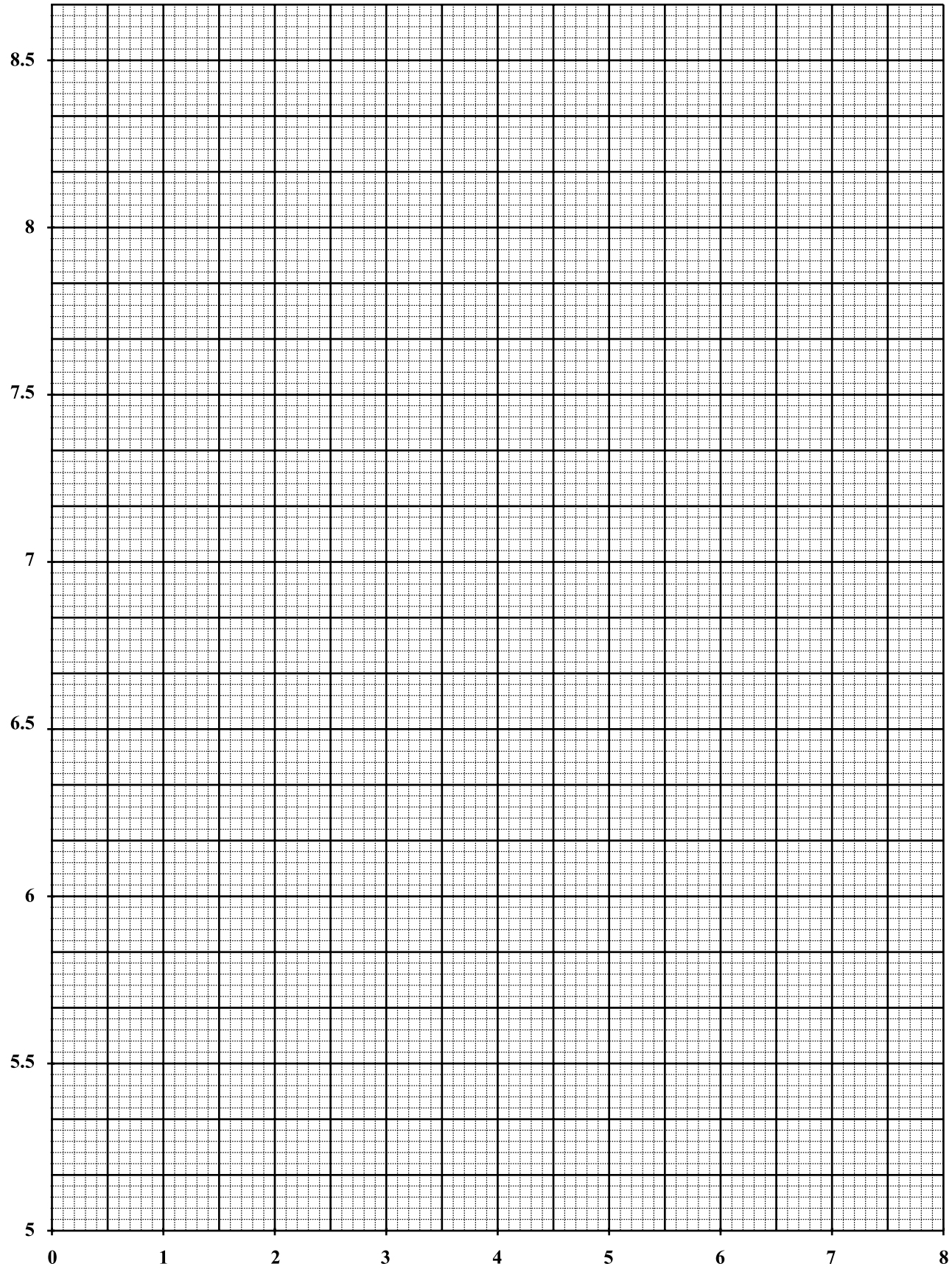


Figure 2.

2. (a) Distinguish between 'excretion' and 'egestion'.

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(2 marks)

(b) Figure 3 is a diagram showing excretory structures of the human body.

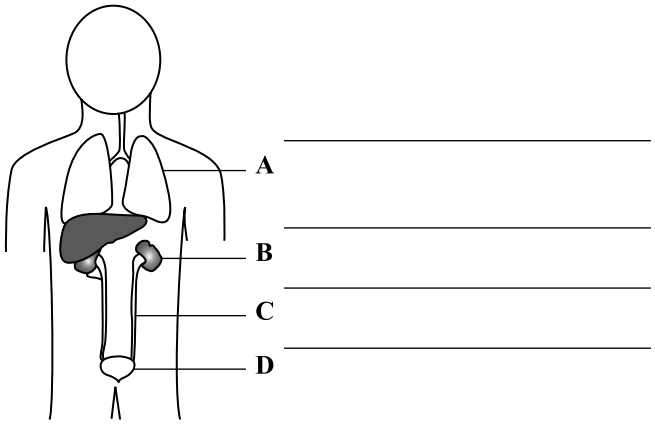


Figure 3. Excretory structures of the human body

(i) Identify the structures labelled **A**, **B**, **C** and **D** in Figure 3. Write your answers in the spaces provided. **(4 marks)**

(ii) State the function of the part labelled D in Figure 3.

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(1 mark)

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(c) Figure 4 shows Mr Boodoo at work in his backyard. The arrows show the direction of water flow in a stream that passes through his property.

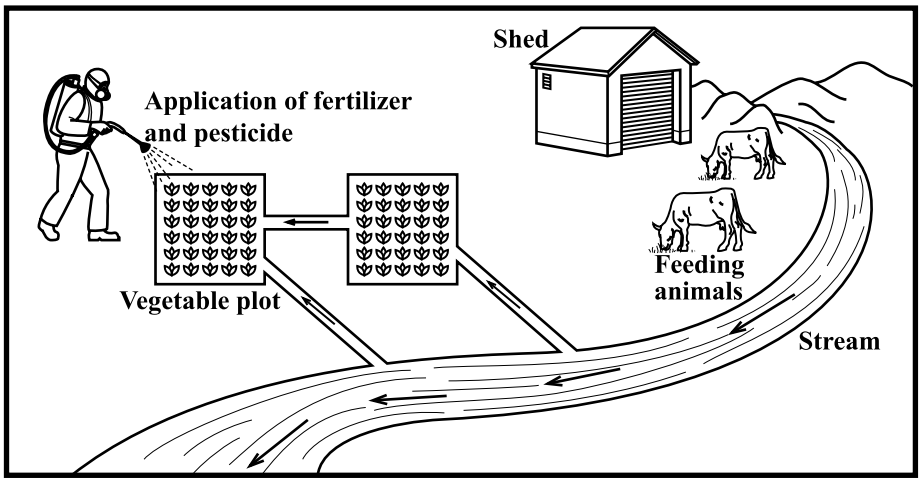


Figure 4. Mr Boodoo at work in his backyard

(i) Identify ONE excretory product that is likely to be present in the atmosphere of Mr Boodoo's backyard.

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(1 mark)

(ii) Identify ONE excretory product that is likely to be present in the soil of Mr Boodoo's backyard.

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(1 mark)

(iii) State ONE disadvantage and ONE advantage of the excretory product named in (ii) above.

Advantage .....

(1 mark)

Disadvantage .....

(1 mark)

(iv) Explain how the water from the stream may be made safe for drinking.

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(4 marks)
Total 15 marks

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3. (a) (i) Define the term 'force'.

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(1 mark)

(ii) State TWO effects of a force on a body.

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(2 marks)

(iii) What is the unit of force?

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(1 mark)

(b) Friction is an example of a force. Explain what is meant by a 'frictional force'.

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(1 mark)

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(c) Frank decides to investigate the effects of friction on a toy car. First he applied a force of 100 N to a toy car on a horizontal surface, and observed how far it travelled. Then he oiled the axles as shown in Figure 5. He then applied a force of 100 N to the same car on the same horizontal surface, and observed how far the car travelled.

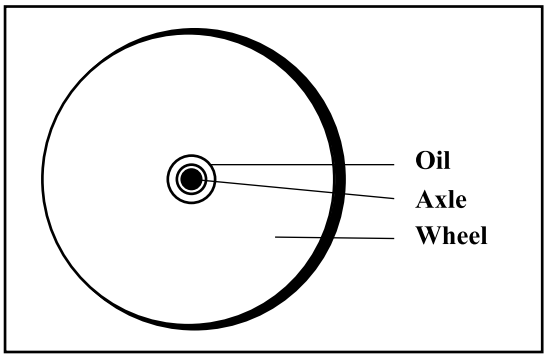


Figure 5. Diagram to show the axle after oiling

The following data was obtained.

TABLE 3: RESULTS TO SHOW DISTANCE TRAVELLED

State of Axle	Distance Travelled (m)
Without oil	20
With oil	50

(i) State ONE variable that is held constant during the experiment.

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(1 mark)

(ii) Explain why the car was able to travel further when the axle was oiled.

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(2 marks)

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(iii) From the experiment on **page 9**, state ONE advantage of friction and ONE disadvantage of friction.

Advantage

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(1 mark)

Disadvantage

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(1 mark)

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(d) Frank normally parks his car on a slope. He replaces his car tyres with taller ones and the car topples over when he parks as shown in Figure 6.

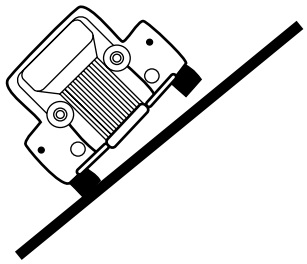


Figure 6. Car parked on slope

Explain the effect of changing the car tyres on:

(i) The centre of gravity of the body of the car

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(1 mark)

(ii) The stability of the body of the car

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(1 mark)

(e) (i) Frank's father was driving his new racing car at a fast speed on a wet and slippery track. He applied the brakes suddenly. Explain the role of the endocrine system as he performed this activity.

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(2 marks)

(ii) Name ONE system in the body, **other** than the endocrine system, that plays an important role in the situation in (e) (i).

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(1 mark)
Total 15 marks

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4. (a) (i) What is a microorganism?

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(1 mark)

(ii) State ONE way by which the growth of mould on bread may be reduced.

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(1 mark)

(b) Terrance wants to investigate the growth of mould on multigrain bread under different conditions. Figure 7 shows how the experiment was setup.

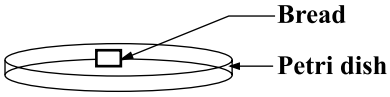
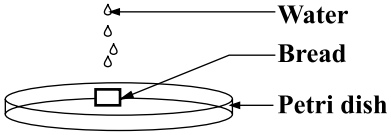
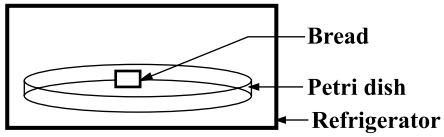
		
Bread left dry, in open air	**Bread moistened with 5 drops of water and left in open air**	**Bread left dry and placed in the refrigerator**

Figure 7. Experiment to investigate the growth of mould on bread

After one week the three pieces of bread were observed. Terrance noticed that the second piece of bread had the most mould followed by the first and finally the third.

(i) Name ONE microorganism that is used to make bread in the commercial industry.

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(1 mark)

(ii) Using the observations in the experiment, determine THREE conditions that are necessary for mould growth.

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(3 marks)

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(iii) What is the effect of refrigeration on mould growth?

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(2 marks)

(iv) State whether there will be any mould growth if Terrance conducts the experiment in a vacuum (no air). Explain your answer.

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(2 marks)

(c) Explain why it is not advisable for Terrance to eat bread that has mould growing on it.

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(1 mark)

(d) Name TWO methods that can be used to preserve foods.

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(2 marks)

(e) Bread is baked at temperatures that do not support mould growth. Explain why mould is MOST likely to grow on bread when it is exposed to the atmosphere.

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(2 marks)

Total 15 marks

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SECTION B

Answer BOTH questions.

5. (a) Mr Brown is a carpenter who plays cricket on weekends. He consumes a large quantity of ground provisions (yam, dasheen, potato) in his diet. Discuss the importance of this food choice to Mr Brown's work and weekend activity. **(3 marks)**

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(b) To ensure that his diet is suited for his activities, it is recommended that Mr Brown include other Caribbean food groups. Name THREE Caribbean food groups that should be included in his diet and explain the importance of these food groups. **(6 marks)**

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(c) In his job, Mr Brown often uses machines that are made of metals. Identify FOUR machines (tools) that are made of metals and discuss ONE factor that may reduce the efficiency of these machines (tools). **(6 marks)**

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Total 15 marks

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6. In the Caribbean, many people use vehicles which run on gasoline, diesel or natural gas. These come from petroleum which is obtained from wells drilled in the ground. Keshorn and his family returned home to the Caribbean after living in the United States of America. They brought an electric car with them.

(a) Explain how petroleum and coal are formed. **(5 marks)**

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(b) Keshorn's father would like to install a system where the sun's energy would be used to charge the batteries in the electric car. Describe TWO advantages and TWO disadvantages of using the solar energy. **(4 marks)**

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(c) Outline TWO negative effects on the local environment if the family uses a gasoline powered car. **(2 marks)**

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(d) State TWO alternative sources of energy, **other** than solar energy, that are easily available to Keshorn's father in the Caribbean and explain why these sources are considered readily available. **(4 marks)**

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Total 15 marks

END OF TEST

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

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