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FILL IN ALL THE INFORMATION REQUESTED CLEARLY IN CAPITAL LETTERS.

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SUBJECT HUMAN AND SOCIAL BIOLOGY – Paper 02

PROFICIENCY GENERAL

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CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE®
EXAMINATION

HUMAN AND SOCIAL BIOLOGY

SPECIMEN PAPER

Paper 02 – General Proficiency

2 hours

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

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

1. Figure 1 illustrates the processes occurring in the carbon cycle.

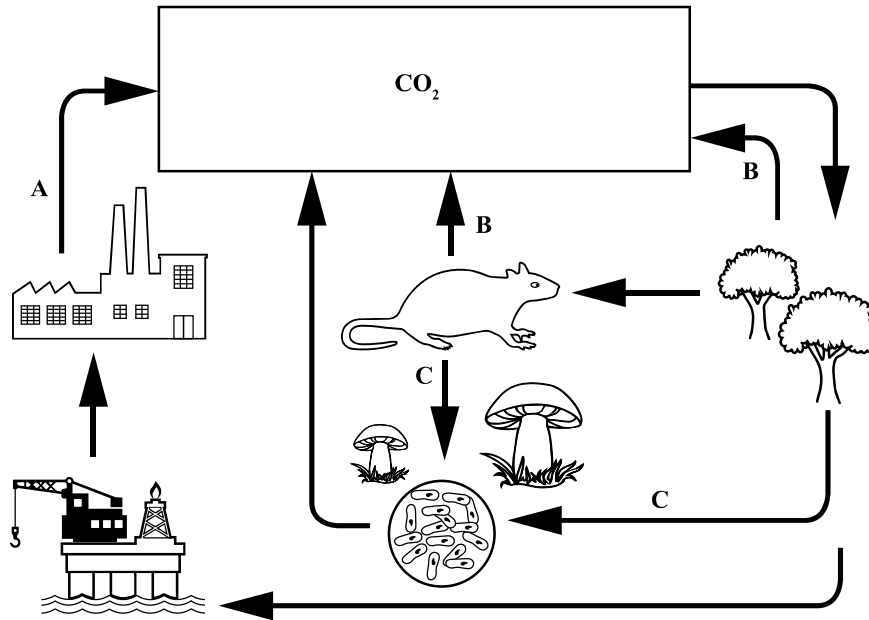


Figure 1. Carbon cycle

- (a) Identify EACH of the processes occurring at A, B and C.

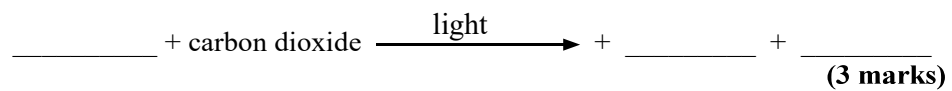
A

B

C

(3 marks)

- (b) Carbon dioxide is removed from the atmosphere during the process of photosynthesis. Complete the following equation by inserting the missing reactant and products of photosynthesis.



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- (c) Figure 2 shows the changes in the hurricane intensity index (which accounts for hurricane frequency, duration and strength) and sea surface temperatures over time.

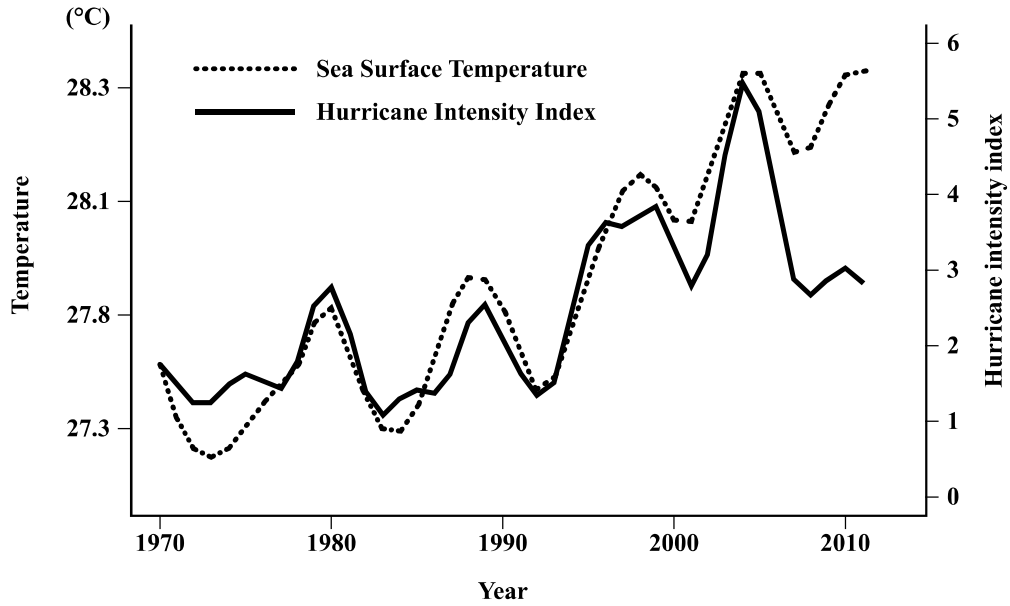


Figure 2. Changes in hurricane intensity index

- (i) State the relationship between sea surface temperature and the intensity of hurricanes.

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(2 marks)

- (ii) Explain how increasing levels of carbon dioxide could contribute to more intense hurricanes.

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(3 marks)

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Figure 3 illustrates an energy-inefficient kitchen.



Figure 3. Energy-inefficient kitchen

- (d) The burning of fossil fuels to produce electricity contributes to atmospheric carbon dioxide.

Suggest TWO ways in which the kitchen in Figure 3 could be made more energy-efficient. Give ONE reason for EACH way suggested.

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(4 marks)
Total 15 marks

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2. (a) (i) Define the term 'blood pressure'.

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(2 marks)

(ii) Differentiate between the terms 'systole' and 'diastole'.

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(2 marks)

(iii) Karen has a blood pressure reading of 120/80. Identify which number in the reading is the systole.

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(1 mark)

(iv) State ONE **modifiable** risk factor for high blood pressure.

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(1 mark)

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- (b) Peter's diet consists of fruits, grains, nuts and vegetables. James smokes heavily but is very careful with his diet and eats no meat. John has a diet that is rich in fats and processed foods.

Table 1 shows the blood pressure readings of Peter, James and John.

TABLE 1: BLOOD PRESSURE READINGS

Peter	James	John
120/80	140/90	225/160

- (i) Explain why James' blood pressure is lower than John's blood pressure, even though James smokes heavily.

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(4 marks)

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- (ii) Since both James and John have elevated blood pressures, the doctor recommended that each of them do a fitness test which involves a stepping exercise. James and John exercised for four minutes and the changes in their heart rates per minute were recorded in Table 2.

TABLE 2: HEART RATES OF JAMES AND JOHN

Time/Minute	Heart Rate/Beats per minute	
	James	John
0	60	80
1	60	90
2	80	140
3	95	156
4	120	170
5	90	160
6	80	140
7	60	90

Describe the changes in John’s heart rate.

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(2 marks)

- (iii) State how the changes in John’s heart rate differ from those of James’ heart rate.

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(1 mark)

- (iv) Explain why John’s heart rate did NOT return to its basal rate and suggest ONE lifestyle change that he could make to improve his cardiac function.

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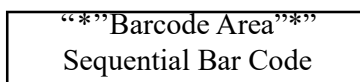
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3. (a) Our foods are made up of macronutrients and micronutrients, both of which are necessary for good health.

(i) Name ONE macronutrient and ONE micronutrient found in foods.

Macronutrient

Micronutrient

(2 marks)

(ii) Identify ONE element that is common to ALL macromolecules.

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(1 mark)

(iii) Name ONE healthy macronutrient food source that provides energy for the body.

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(1 mark)

(b) Benita and Benny are both concerned about their weight. Benny eats large amounts of food and then attempts to forcibly get it out of his system. Benita eats a minimal amount of food, but when she looks in the mirror, she sees a fat person.

(i) Define the term 'malnutrition'.

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(2 marks)

(ii) Name the eating disorders that Benita and Benny have.

Benita

Benny

(2 marks)

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- (iii) Benny wants to become a professional basketball player. Explain TWO effects his eating disorder could have on his body, thereby affecting his ability to take part in this sport.

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(4 marks)

- (iv) Benita wants to start a family but her menstrual period is irregular. Explain why Benita will MOST likely find it difficult to conceive.

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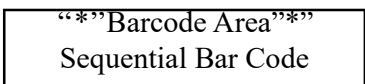
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(3 marks)

Total 15 marks

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4. (a) (i) State the location of the chromosomes in the cytoplasm of the cell during metaphase.

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(1 mark)

(ii) Explain why a chromosome resembles an 'X' during metaphase.

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(2 marks)

(b) Figure 4 is a pedigree that shows the inheritance of a genetic disorder.

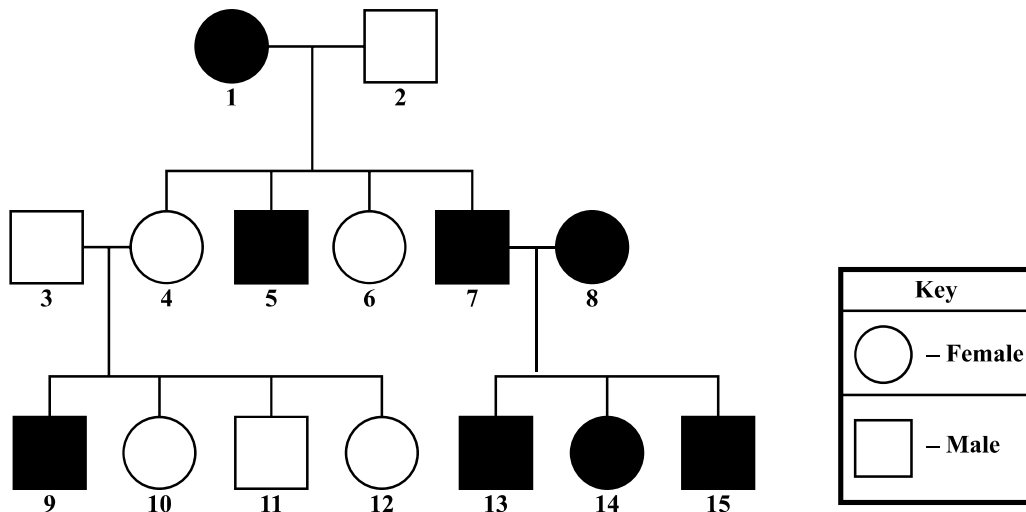


Figure 4. Pedigree of a genetic disorder

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- (i) Identify the type of inheritance illustrated in the pedigree in Figure 4.

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(1 mark)

- (ii) Identify, by number, ONE female in Figure 4 who has developed the disorder.

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(1 mark)

- (iii) State ONE **other** example of a genetic disorder that displays the type of inheritance depicted in Figure 4.

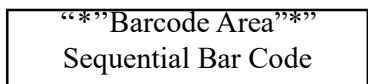
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(1 mark)

- (c) (i) Many Caribbean farmers are opting to use genetically modified seeds to grow their crops. As a result, native forms of crops are becoming rare.

Outline TWO reasons why native crops are becoming rare due to the overuse of genetically modified seeds.

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(4 marks)

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- (ii) State TWO reasons why a farmer would choose to plant genetically modified crops instead of native varieties.

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(2 marks)

- (iii) Only a few companies worldwide are producing genetically modified seeds. Usually the seeds from the previous crop do not grow and the farmer has to purchase more seeds for the next year's crop.

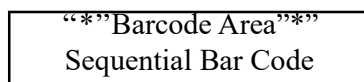
Suggest THREE ethical concerns, regarding genetically modified seeds, of which the people of the Caribbean should be aware.

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SECTION B

Answer ALL questions in this section.

5. Cancer is a very difficult disease to manage and often results in death.

(a) (i) Define the term 'cancer'.

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(2 marks)

(ii) Identify TWO organs in which cancer is **most** common in the Caribbean.

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(2 marks)

(iii) State TWO forms of treatment for **most** cancers.

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(2 marks)

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6. (a) (i) State TWO differences between a 'landfill' and a 'dump'.

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(4 marks)

(ii) State TWO disadvantages of disposing solid waste in a dump.

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(2 marks)

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- (ii) Ramco Tyres has been fined by the village council for the burning of tyres. The company appeals the fine on the basis that it is on the outskirts of the village and therefore its activities do not really affect the neighbouring community.

Suggest THREE ways in which the company's activities could negatively affect the village.

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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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