FORM TP 2005046

MAY/JUNE 2005

CARIBBEAN EXAMINATIONS COUNCIL

SECONDARY EDUCATION CERTIFICATE EXAMINATION

BIOLOGY

Paper 02 - General Proficiency

$1\frac{1}{2}$ hours

- 1. Candidates MUST attempt ALL the questions on this paper.
- Candidates 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.

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You should NOT spend more than 30 minutes on Question 1.

1. In studying a particular habitat, a group of students finds the distribution of organisms shown in Table 1 below:

Organism	Number/10 quadrat throws	
Mole crickets	18	
Herbivorous bug	22	
Butterfly	18	
Grasses and herbs	230	
Praying mantis	6	
Lizard	1	
Ants	65	

TABLE 1: ORGANISMS FOUND IN THE HABITAT UNDER STUDY

(a) (i) In the space provided below, construct a pie chart to show the relative proportions of the organisms the students found occupying the habitat.



(4 marks)

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	(ii)	What is the advantage of using a pie chart to represent the data in Table 1?		
		(2 marks)		
	(iii)	Identify another means besides a table and pie chart to represent the data in Table 1.		
		(1 mark)		
	(iv)	Identify TWO carnivores from the data contained in Table 1 and the pie chart .		
		(2 marks)		
(b)	(i)	From the organisms the students find in the habitat, identify a food chain with at least FOUR organisms.		
		(2 marks)		
	(ii)	Suggest TWO long-term effects on the habitat, if a pair of flycatchers (insect- eating birds) suddenly enter the habitat under study.		

(2 marks)

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(c) In another study undertaken by the same group of students, they find Specimens A to D represented in Figure 2 below. The students claim that the specimens belong to the same group.

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Figure 2. Specimens students find in the second study

 Identify TWO features shown in the drawings that can be used to classify the specimens.

(2 marks)

(ii) In the space provided below, accurately draw Specimen B twice the size shown in Figure 2. State the magnification of your drawing.

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(d)	The students observe that a particular species of plant in the original study area occurs
	in two varieties, one with completely green leaves and the other with leaves that are
	mainly red. The students suggest that the green variety is a more efficient plant than the
	red variety and therefore wish to compare the rates at which they would photosynthesise.
	They propose a hypothesis and decide on an investigation to test that hypothesis.

(i) Based on the students' observation, suggest a hypothesis for the investigation.

	(2 mar
Describe the invo suggested in (d) (method you would	estigation you would undertake to test the hypothesis y (i). Include in your description the apparatus, materials a ld use.
Apparatus and Ma	aterials:
Method:	
	(4 mark
State TWO enviro	onmental factors that affect the rate of photosynthesis.
	(2 mark
Write an equation hesis.	to adequately represent the processes involved in photosy
Write an equation hesis.	to adequately represent the processes involved in photosy

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(a) Figure 3 below shows the location of selected glands in the female human body.



Figure 3. Selected glands of the female human body

- Label Figure 3 to show the position of THREE glands that produce hormones involved in growth and development in humans. (3 marks)
- (ii) Complete the table below to identify and give the role of the hormones of growth and development produced by the glands you located in (a) (i).

Gland	Growth & development hormone produced	Role of hormone	
1.			
2.			
3.			

(6 marks)

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(i) a) Identify ONE other type of gland in the human body.

(1 mark)

b) Give ONE example of the type of gland you identified in (b) (i) a) above.

(1 mark)

 Give ONE similarity and ONE difference between endocrine glands and the type of gland identified in (b) (i).

Similarity: _____
Difference: _____

(2 marks)

- (c) If the gene for insulin production is transferred from a human pancreatic cell to a certain bacterium, it produces human insulin within the bacterium.
 - (i) Give the name of the process of transfer of the gene.
 - (ii) State ONE advantage of the process you mentioned in (c) (i) above.

(3 marks)

Total 16 marks

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3.	Figur	e 4 belo	ow shows the basic plan of t	wo flowers, Flowers 1	and 2.		
				1			
	(Flower 1		Flower 2		
	Figure 4. Two types of flowers						
	(a)	(i)	Name the parts of Flower	s 1 and 2, labelled I to	V, in Figure 4 above.		
			I	IV			
			п	V			
			III		(5 marks)		
		(ii)	The flower structures labe structures.	lled in Figure 4 are som	etimes referred to as 'essential'		
		80	Suggest ONE reason for t structures.	he use of the term 'ess	ential' to describe the labelled		
					(2 marks)		
	(b)	(i)	Identify the pollinating ag	ent for EACH flower i	n Figure 4.		
			Flower 1:				
			Flower 2:	-	(2 marks)		

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Characteristics in Flower 1:	
Characteristics in Flower 2:	
ander in the second	
	111

(c) In the space provided below, draw in outline TWO simple diagrams to represent the shape of the fruit EACH flower is likely to produce.

Fruit of Flower 1

Fruit of Flower 2

(2 marks)

Total 15 marks

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 Some seedlings are transplanted onto garden beds and the changes in their mass are noted over a period of time. The changes are recorded in the graph below.

		IV	
3	Mass/ grams	m	
		п	
		1 (
		Time/ weeks	
		Figure 5. Change in mass of seedlings	
(a)	Describe the	changes taking place at stages II and IV.	
	Stage II:		
	-		
	Stage IV:		
			(4 marks)
(b)	Identify TWC	D mineral salts found in garden soil and explain the role of EAG	CH salt.
	Mineral salt 1:	1	
	Role:		
	Mineral salt 2	· · ·	
	Deles		
	Kole:		(4 marks)

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- (c) During their life cycle plants may store large amounts of excess food.
 - (i) Explain TWO advantages to the plant of storing food in its seeds.

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5. Figure 6 below shows the inheritance of earlobe size in a human family.

(1 mark)

(iii) Give ONE reason for the importance of variation among living things.

Identify the type of variation involved in the inheritance of earlobe size in

Family member 6:

humans shown in Figure 6 above.

(1 mark)

(3 marks)

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(ii)

There are various blood group systems, but the one most commonly used is the ABO (b) system. Account for the fact that in the ABO system, although there are FOUR different blood groups in existence, only THREE alleles determine these blood groups. (3 marks) (c) Name ONE inherited disease. (1 mark) How do the treatment and control of an inherited disease differ from the treatment and (d) control of a deficiency disease? Treatment: Control: (4 marks) Total 13 marks

END OF TEST