FORM TP 2016153



TEST CODE **02207020**

MAY/JUNE 2016

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN ADVANCED PROFICIENCY EXAMINATION®

BIOLOGY

UNIT 2 - Paper 02

2 hours 30 minutes

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

- 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.

Ē

- 4. You may use a silent, non-programmable calculator to answer questions.
- You are advised to take some time to read through the paper and plan your answers.
- 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.

Copyright © 2014 Caribbean Examinations Council All rights reserved.

SECTION A

Answer ALL questions.

Write your answers in the spaces provided in this booklet.

1.	(a) Figure 1 is an incomplete, detailed	rawing of a section of a dicotyledonous leaf.
•		

Figure 1. Section of a dicotyledonous leaf

Source: htpp://www.tutornext.com/biology

- (i) Complete the drawing in Figure 1 to accurately show palisade cells and a vascular bundle. [4 marks]
- (ii) Use annotated labels to identify and describe the cells labelled I and II. Write your answers in the space designated in Figure 1. [4 marks]

(b) Figure 2 is a flowchart outlining how nitrogen is cycled in ecosystems.

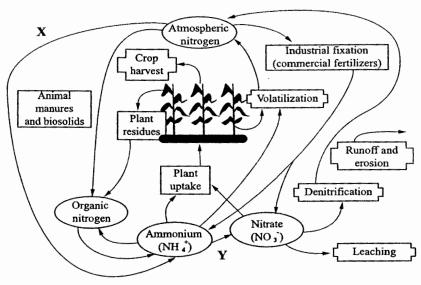


Figure 2. The nitrogen cycle

Source: http://www.virginiacrops.com

(i)	Name the processes labelled ${\bf X}$ and ${\bf Y}$, and for EACH process give a brief description.
	Process X:
	Process Y:
,	[4 marks

(ii)

ķ

With reference to Figure 2, comment on ONE major human activity which has had an impact on global nitrogen cycling .		7	S
		7 3	15.4
		2 2	¥ Z
		3 13	ME
		DONOT WRITE IN THIS AKE	DO NOT WRITE IN THIS AREA
) 00	Š
		7	₹.
		SARI	SMR
[3 marks]			7.7
Total 15 marks	\$	DO NOT WRITE IN THIS ARE.	DO NOT WRITE IN THIS MRE
	0 cc	TWR	FWR
		0 > 0	ONO
	100 100 100 100 100 100 100 100 100 100	٩	٩
		₹.	4
		ARE	ARE
	66 66 66 66 66 66 66	THI	THIS
		TEIN	VE IV
	100 100 100 100 100 100 100 100 100 100	T WRITE IN THIS ARE	GWRATE IN THIS ARE
		~ 1	7.5

(a) Adult human haemoglobin samples are exposed to different concentrations (partial pressures) of oxygen. The amount of oxygen that combines with each sample is expressed as the percentage saturation of haemoglobin with oxygen, as shown in Table 1.

TABLE 1: SATURATION OF HAEMOGLOBIN WITH OXYGEN

Partial Pressure of Oxygen (kPa)	Saturation of Haemoglobin With Oxygen (%)
0	0
1	6
2	22
3	41
4	57
5	71
6	81
7	87
8	. 91
10	94
. 12	96
14	98

(i)

Data adapted from Biology Unit 2 for CAPE Examinations 2011, Ramesar et al, p. 127

On the grid provided on page 9, plot a line graph of saturation of haemoglobin

	at various partial pressures of oxygen.	[4 marks]
(ii)	With reference to the shape of the graph, describe observed changes i of oxygen by haemoglobin as the oxygen concentration increases.	
		•••••

GO ON TO THE NEXT PAGE

[2 marks]

Comment on the significance of this response for oxygen transport in the bady.
[2 marks]

(b) Figure 3 is a photomicrograph of a section through the medulla of the kidney of a mammal.

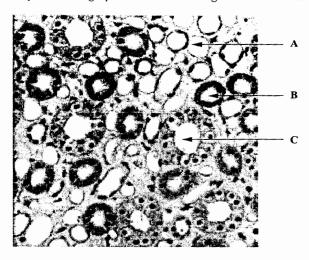


Figure 3. Section of a mammalian kidney

Source: http://quizlet.com/5351362/urinary-and-reproductive-histology-flash-cards/

(i)	Identify the regions of the nephron labelled A, B and C.		
	A:	•	
	B:		
	C:		
	[3 mark		

(ii)

Outline the process of urea formation and suggest a reason why urea in the formation of nitrogenous waste is produced in mammals.
· · · · · · · · · · · · · · · · · · ·
[4 marks

Total 15 marks

(a) Table 2 is an incomplete comparison of humoral and cell-mediated immunity.
 Complete Table 2 by writing the answers in the relevant spaces.

TABLE 2: COMPARISON OF HUMORAL AND CELL-MEDIATED IMMUNITY

Characteristic	Humoral Immunity	Cell-mediated Immunity
Cell type	B lymphocytes	
Mode of action	Antibodies circulating in serum (blood)	
Purpose		Primary defense against intracellular pathogens,tumour cells, graft rejection
Onset		Delayed type hypersensitivity

[4 marks]	
Explain why after a first infection with measles a person is unlikely to be reinfected.	(ii)
[3 marks]	

(b) Table 3 shows selected findings of a comparative analysis of student drug usex various Caribbean countries.

TABLE 3: AVERAGE AGE OF FIRST USE OF ALCOHOL BY GENDER

Country	Male	Female
Antigua and Barbuda	11.2	11.4
Barbados	10.9	10.9
Dominica	10.9	11.4
Haiti	13.2	12.8
Grenada	10.9	11.4
Guyana	11.9	12.3
Jamaica	11.2	12.2
Trinidad and Tobago	10.7	11.2

 $Source: http://www.cicad.oas.org/Main/pubs/StudentDrugUse-Caribbe {\color{red} {\bf =20}} 11.pdf$

(i)	Compare the overall average age of first use of alcohol by males will average age of first use by females across the region. Quote overall me in your comparison.	
		m arks

(ii)

Giving a brief explanation, suggest TWO major social consequences of adolescent		
abuse of alcohol in the Caribbean.	7	Ţ
abuse of alcohol in the Caribbean.	DO NOT WRITE IN THIS ARE	DO NOT WRITE IN THIS AREA
	190	\simeq
	-	-
	<u> </u>	
	Lu	L
		~
	2	\mathbf{Z}
	C.	S
	\sim	
	Š	7
	L	
	WRITE IN THIS AREA	2
		•
	60	O ₃
[4 marks]		
	-	
T 115		>
Total 15 marks		
•		14
	~	2
	2	Ž
	õ	Ó
	NO	Ş
	000	0 0
	DONOG	DO NOT WRITE IN THIS AREA
	DO VO	0000
	DO VOI	DOVO
	tow od	0000
	DONOI	0N 0Q
	DO NOT	0V 00
	towoa	OVOG
	tov oa	0V 00
	TE IN THIS AREA DO NOT	
	VRITE JIN THIS AREA	
	VRITE JIN THIS AREA	
		VOT WRITE IN THIS AREA DO NO

SECTION B

Answer ALL questions.

Write your answers in the spaces provided in this booklet.

4.	(a)	With reference to key steps, explain how the net production of high energy compounds is achieved in glycolysis.
		[6 marks]

	definition of biodiversity in your discussion.
	•
(ii)	
(ii)	[5 marks]
(ii)	[5 marks] Giving examples, distinguish between in situ and ex situ conservation methods.
(ii)	[5 marks]
(ii)	[5 marks] Giving examples, distinguish between in situ and ex situ conservation methods.
(ii)	[5 marks] Giving examples, distinguish between in situ and ex situ conservation methods.
(ii)	[5 marks] Giving examples, distinguish between in situ and ex situ conservation methods.
(ii)	[5 marks] Giving examples, distinguish between in situ and ex situ conservation methods.
(ii)	[5 marks] Giving examples, distinguish between in situ and ex situ conservation methods.
(ii)	[5 marks] Giving examples, distinguish between in situ and ex situ conservation methods.
(ii)	[5 marks] Giving examples, distinguish between in situ and ex situ conservation methods.
(ii)	[5 marks] Giving examples, distinguish between in situ and ex situ conservation methods.
(ii)	[5 marks] Giving examples, distinguish between in situ and ex situ conservation methods.

(b)

Myasthenia Gravis (MS) is an autoimmune disease in which the body's antibodies block and destroy the neurotransmitter receptors at neuromuscular junctions.	3
Explain the term 'neuromuscular junction' and using your knowledge of synaptic ransmission, explain why MS results in progressive weakening of the skeletal muscles.	DO NOT WRITE IN THIS ARE
Note: Full details of the sequence of events in synaptic transmission are NOT required.	≥
	28
	9
	Q
	3
	•
	2
	£
	Š
	3
	2000
[7 marks]	
Total 15 marks	

_6 .	(a)	Explain the mechanism by which the dengue fever virus multiplies within the body and the mode of transmission from person to person. Comment on how this knowledge can allow us to better prevent the transmission of the disease.	AREA	DO NOT WRITE IN THIS AREA
			<	2
			2	SI TE
			ž	2
			DONOT WRITE IN THIS AR	8
			oa	oq
			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
				ক
•			2	RE
			SIL	SH
•			2	Ž
		•	TE	J.
			DO NOT WRITE IN THIS ARE.	DO NOT WRITE IN THIS ARE
			Ş	VO.
			0	00
			# # # # # # # # # # # # # # # # # # #	
			R.	8
			THISARE	THIS ARE
				N TE
			2	131
ğ			3	WR
=			DO NOT WRITE	DO NOT WRITE!
÷			Š	00
		GO ON TO THE NEXT PAGE		

(b)

END OF TEST	Total 15 marks	
	[7 marks]	310333333333
		,
	······································	20100000
		00000000
		2000000
		101000000
		diddiddid
		20000000
·		
		- E3

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