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CANDIDATE PLEASE NOTE
You must sign below and return this booklet
with the Answer Sheet. Failure to do so may
result in disqualification.

TEST CODE 02207010

FORM TP2010142

MAY/JUNE 2010

CARIBBEAN EXAMINATIONS COUNCIL
ADVANCED PROFICIENCY EXAMINATION
BIOLOGY - UNIT 2

Paper 01

90 minutes

11 JUNE 2010 (a.m.)

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This test consists of 45 items. You will have 90 minutes to answer them.
2. In addition to this test booklet, you should have an answer sheet.
3. Do not be concerned that the answer sheet provides spaces for more answers than there are items in this test.
4. Each item in this test has four suggested answers lettered (A), (B), (C), (D). Read each item you are about to answer and decide which choice is best.
5. On your answer sheet, find the number which corresponds to your item and shade the space having the same letter as the answer you have chosen. Look at the sample item below.

Sample Item

Which of the following is NOT a form of energy storage?

- (A) ATP
- (B) Lipid
- (C) Alcohol
- (D) Lactic acid

Sample Answer

(A) (B) (C) (D)

The best answer to this item is "ATP", so answer space (A) has been shaded.

6. If you want to change your answer, erase it completely and fill in your new choice.
7. When you are told to begin, turn the page and work as quickly and as carefully as you can. If you cannot answer an item, omit it and go on to the next one. Your score will be the total number of correct answers.
8. You may do any rough work in this booklet.
9. Figures are not necessarily drawn to scale.

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

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- (b) State ONE way in which the apparatus in Figure 1 on page 2 could be modified to determine the effect of temperature on the oxygen uptake by germinating peas.

[1 mark]

- (c) Figure 2 below is a simplified diagram of the Krebs cycle and the preceding reactions.

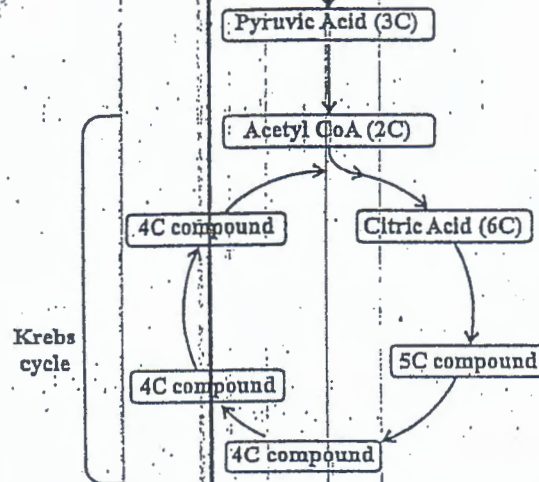


Figure 2. Krebs cycle

- (i) On Figure 2, label EACH of the following stages with the letter .
- a) C to indicate decarboxylation reactions
 - b) H to indicate dehydrogenation reactions. [5 marks]
- (ii) State EXACTLY where the Krebs cycle occurs in a cell.

[1 mark]

- (iii) Briefly explain the role of NAD in the Krebs cycle, in relation to energy production.

[2 marks]

Total 15 marks

2. (a) State FOUR structural features of xylem vessels.

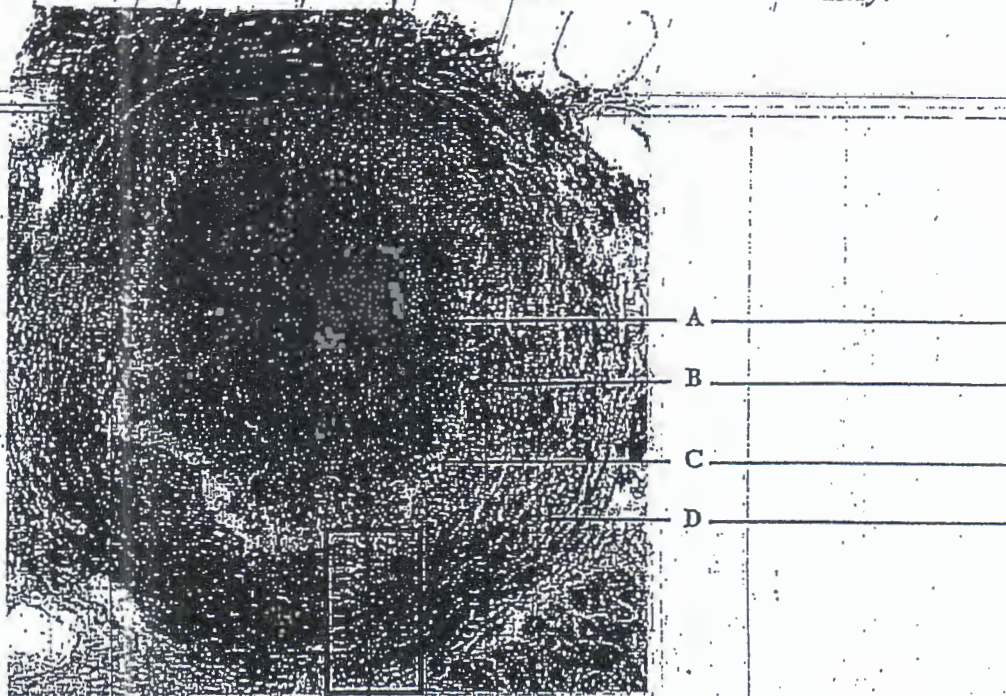
- (i) annular
- (ii) scalariform
- (iii) bordered
- (iv) tracheids

[4 marks

(b) Xylem vessels play an important role in the conduction of water and mineral salts in plants. Using THREE of the features listed at (a), explain how EACH feature facilitates the conduction of water and mineral salts in plants.

[3 marks

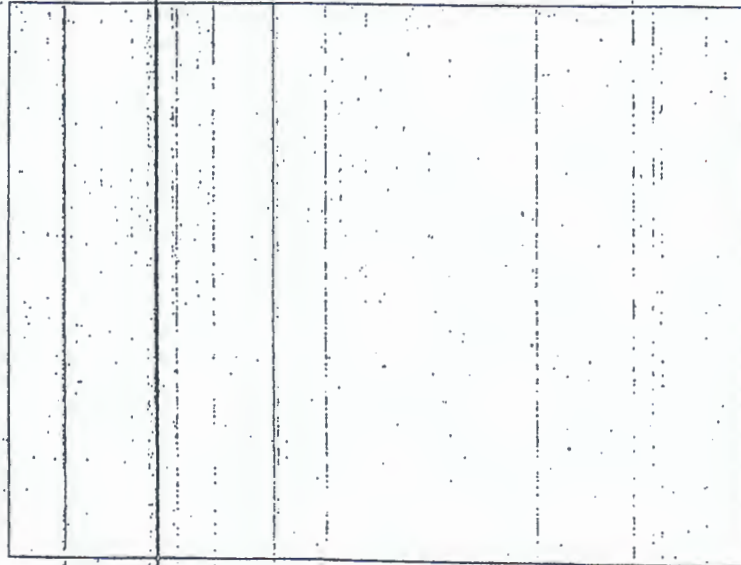
(c) Figure 3 below is a cross-section of a mammalian muscular artery.



Box A

Figure 3. Cross-section of a mammalian artery.

- (i) Identify the tissues labelled A, B, C and D. Write your answers in Figure 3. [2 marks]
- (ii) In the box provided below, draw a plan diagram to show the distribution of the major tissues of the artery wall in Box A in Figure 3. Make your drawing twice the size of Box A.



[5 marks]

(iii) The photograph in Figure 3 on page 5 has been magnified 100 times. What is the ACTUAL width of the artery wall in the region of Box A?

[1 mark]

Total 14 marks

3. A survey was conducted among the residents of a large metropolitan city in order to assess the use of psychoactive substances. Twelve hundred persons responded. The data that was collected is presented in Table 1.

TABLE 1. USE OF PSYCHOACTIVE SUBSTANCES

Substance	Number of Users		
	Males	Females	Total
Alcohol	450	420	870
Tobacco	380	310	690
Cannabis	80	25	105
Tranquilizers	10	20	30
Stimulants	15	10	25
Total	935	785	1720

Figure 4 below shows an incomplete bar chart of the data in Table 1.

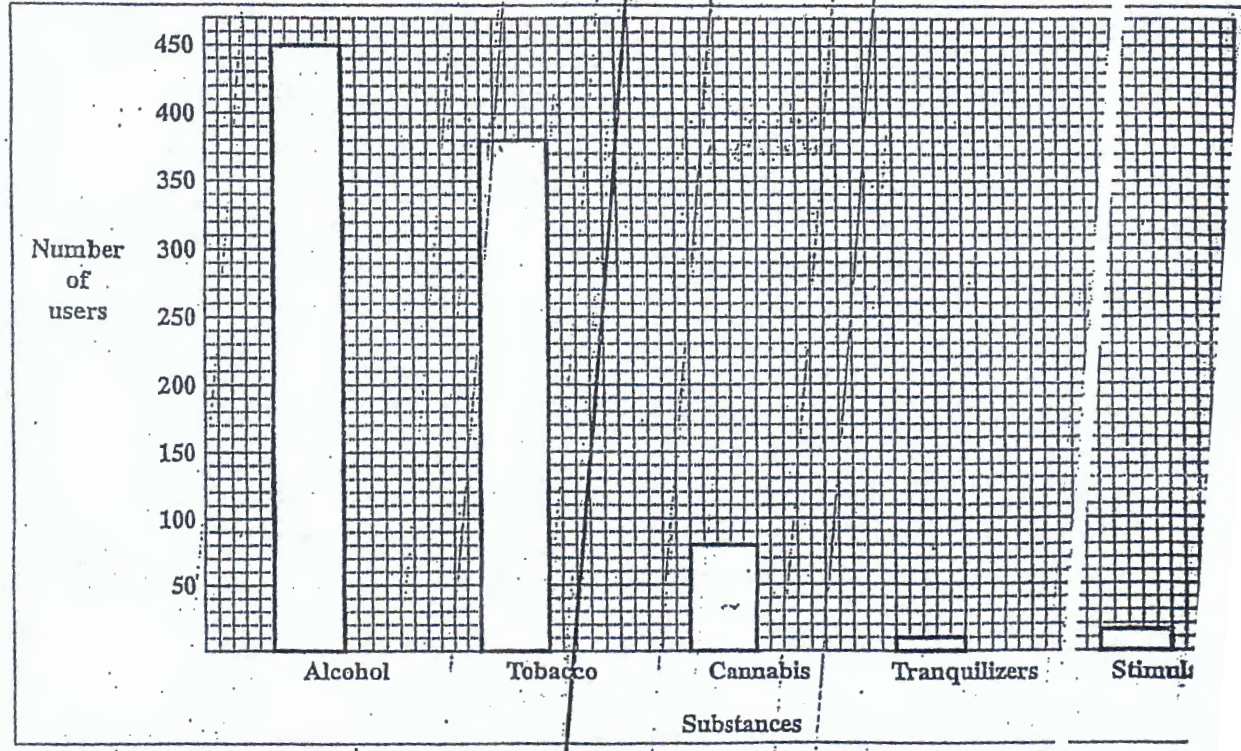


Figure 4. Bar chart

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(a) (i) Complete the bar chart shown in Figure 4 to show the data collected on the female users. [3 marks]

(ii) State THREE significant trends in relation to the use of psychoactive substances that are demonstrated by the data.

Four horizontal lines for writing the answer to question (a)(ii).

[3 marks]

(b) (i) Explain how consistent use of alcohol affects the liver. Your answer should include TWO points.

Four horizontal lines for writing the answer to question (b)(i).

[4 marks]

(ii) State ONE way consistent use of alcohol during pregnancy can adversely affect the foetus.

One horizontal line for writing the answer to question (b)(ii).

[1 mark]

(c) Although a large number of persons reported using these psychoactive substances, it cannot be concluded that their use constitutes either a health or social risk. Suggest, with an explanation, TWO other kinds of data that could be collected and used to make this determination.

Four horizontal lines for writing the answer to question (c).

[4 marks]

Total 15 marks

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SECTION B

Answer ALL questions. You must write your answers in the answer booklet provided.

4. (a) Distinguish between the terms 'ecosystem' and 'ecological niche'. [4 marks]
- (b) Explain why energy is said to flow through, and not cycle, as it is transferred within an ecosystem. [4 marks]
- (c) (i) Using examples, explain the difference between the terms 'in situ' and 'ex situ' as they relate to biological conservation. [3 marks]
- (ii) The population of many species of large mammals can be preserved by the use of zoological parks. Discuss TWO challenges associated with the use of zoological parks for the maintenance of biodiversity. [4 marks]

Total 15 marks

5. (a) (i) The external environment of animals is constantly changing, while the internal environment remains fairly constant. Explain how hormones contribute to the maintenance of this fairly constant internal environment. [5 marks]
- (ii) Ethene gas speeds up the ripening of fruits. Suggest TWO other ways in which ethene plays a regulatory role in plants. [2 marks]
- (b) A nephron consists of distinct sections, each of which serves a different function. Collectively, these sections ensure that urine is formed by a process of ultra-filtration and selective re-absorption and secretion.
- (i) Distinguish between 'ultra-filtration' and 'selective re-absorption' in relation to urine formation. [2 marks]
- (ii) The proximal convoluted tubule is responsible for the process of selective re-absorption. With reference to THREE structural features of the proximal convoluted tubule, discuss how it is ideally suited to this function. [6 marks]

Total 15 marks

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morbidity is an incidence of ill health.

(a) Diabetes has become a major contributor to morbidity, mortality and adult disability in the Caribbean.

(i) State ~~THREE~~ key features of diabetes. [3 marks]

(ii) Suggest TWO factors which are thought to be responsible for the increase in diabetes in the Caribbean. [4 marks]

(b) Distinguish between 'natural' and 'artificial immunity'. [4 marks]

(c) Define the term 'monoclonal antibodies' and THREE benefits of the use of monoclonal antibodies in the diagnosis of diseases. [4 marks]

Total 15 marks.

END OF TEST