

FORM TP 2017156



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MAY/JUNE 2017

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN ADVANCED PROFICIENCY EXAMINATION®

BIOLOGY

UNIT 2 – Paper 032

ALTERNATIVE TO SCHOOL-BASED ASSESSMENT

2 hours

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of THREE questions. Answer ALL questions.
2. Write your answers in the spaces provided in this booklet.
3. Do NOT write in the margins.
4. You may use a silent, non-programmable calculator to answer questions.
5. You are advised to take some time to read through the paper and plan your answers.
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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Answer ALL questions.

Write your answers in the spaces provided in this booklet.

1. (a) Figure 1 is an electron micrograph of a transverse section of a leaf cell from a dicotyledonous plant showing an organelle in close proximity to the cell wall (CW), and containing structures labelled X and Y. (Scale bar = 1 μm)

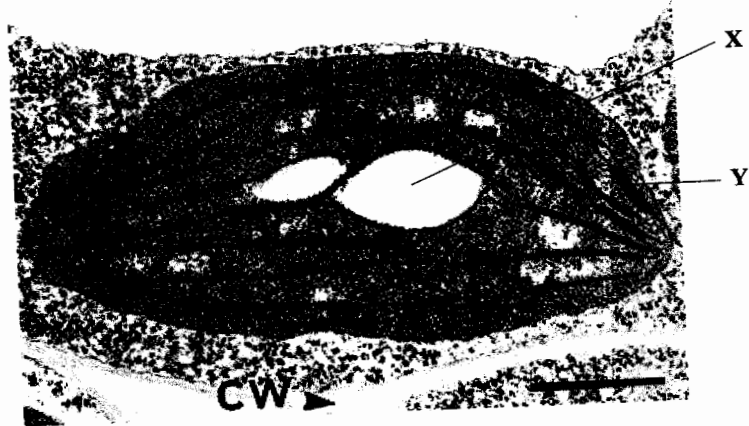


Figure 1. Electron micrograph of a transverse section of a leaf cell showing an organelle

Source: http://plantsinaction.science.uq.edu.au/edition1/files/fig1.07_0.jpg

- (i) Identify the structures labelled X and Y in Figure 1.

X:

Y: [2 marks]

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- (ii) **In the space below**, do a detailed drawing of the organelle in Figure 1, and use label lines to identify **TWO other** structures of the organelle.

[4 marks]

- (iii) Calculate the length of the structure labelled X. **Show your working.**

[2 marks]

- (iv) State the role of the structures labelled X and Y.

X:

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Y:

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[2 marks]

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- (b) Figure 2 illustrates an athlete's oxygen consumption over time in response to exercise. The exercise begins at Time A and ends at Time B, while C and D are the oxygen demands during exercise and at rest, respectively.

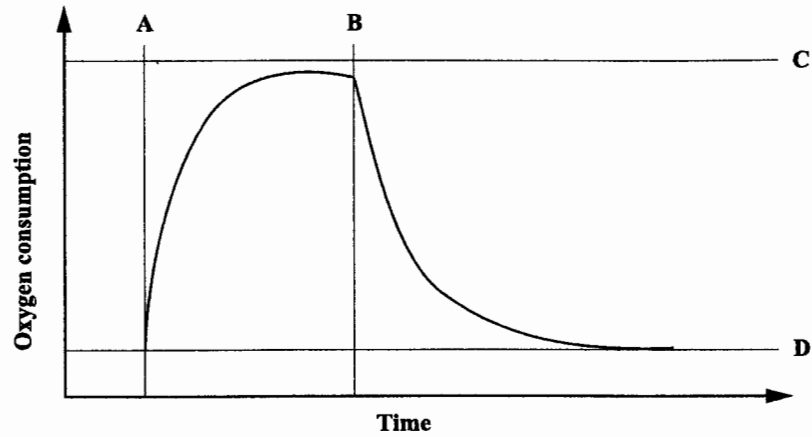


Figure 2. Oxygen consumption over time in response to exercise

- (i) Shade the areas in Figure 2 that correspond to oxygen deficit and repayment of the oxygen debt. Label the shaded areas appropriately. [2 marks]
- (ii) Compare the respiratory reactions that occur during oxygen deficit in animals and in yeast.

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[4 marks]
Total 16 marks
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2. (a) Figure 3 is a diagram of a model used to demonstrate the pressure (or mass) flow theory of translocation in plants. A differentially permeable membrane surrounds the porous structures labelled H and L. To start the demonstration, sucrose solutions of high and low concentrations are placed within H and L, respectively. A dye is also added to the solution in H.

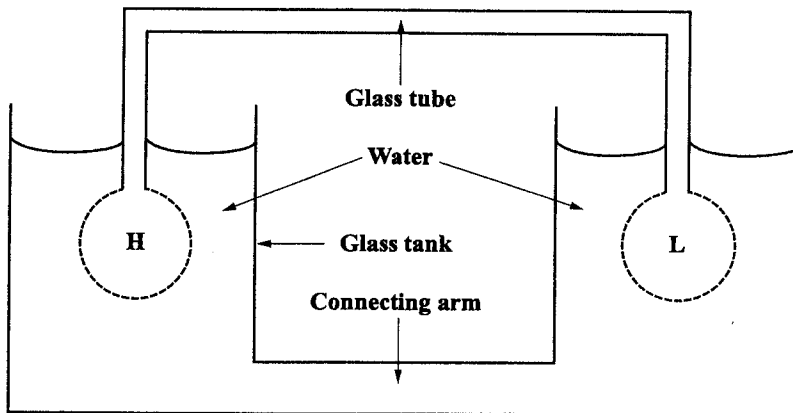


Figure 3. Diagram of a model used to demonstrate the pressure (or mass) flow theory

- (i) On Figure 3, use arrows with annotations to show the net movement of water and/or sucrose solution for EACH of the following:
- Across the differentially permeable membrane at H
 - Across the differentially permeable membrane at L
 - Through the glass tube
 - Through the connecting arm of the glass tank
- [4 marks]
- (ii) Suggest a reason for placing a dye in the sucrose solution at H.

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[1 mark]

- (iii) Suggest a plant part that corresponds to EACH of the structures, H and L, in the model.

Structure H

Structure L

[2 marks]

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- (iii) **In the space below, construct a table to show how the data are to be recorded in your experiment.**

[3 marks]

Total 16 marks

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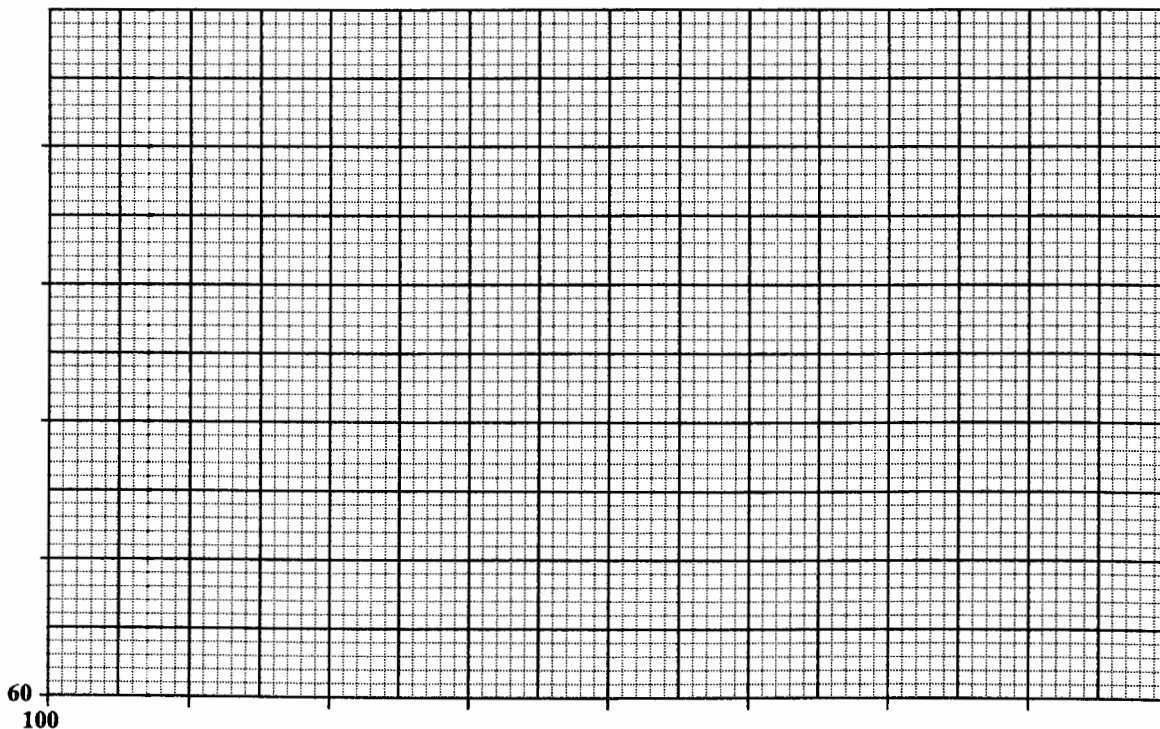
3. (a) Table 1 shows data on incidence and mortality rates for all cancers, for some territories in Latin America and the Caribbean in 2012.

TABLE 1: INCIDENCE AND MORTALITY RATES FOR ALL CANCERS FOR SOME TERRITORIES IN 2012

| Territory | Incidence per 100 000 Persons | Mortality per 100 000 Persons |
|---------------------|-------------------------------|-------------------------------|
| Mexico | 132 | 69 |
| Belize | 161 | 97 |
| Cuba | 218 | 124 |
| Haiti | 107 | 83 |
| Dominican Republic | 153 | 90 |
| Puerto Rico | 211 | 71 |
| Jamaica | 198 | 108 |
| Trinidad and Tobago | 211 | 114 |
| Guyana | 166 | 102 |
| Suriname | 160 | 98 |

Source: GLOBOCAN 2012, <http://globocan.iarc.fr/Pages/Map.aspx>

- (i) On the grid below, plot the data points only (a line connecting points is not required) for mortality versus incidence rate from Table 1.



Title:

[4 marks]

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- (ii) Describe the observed relationship between incidence and mortality for cancer in the region. Using your graph and Table 1, identify ONE territory that does **not** seem to follow the general trend.

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[3 marks]

- (iii) Suggest THREE reasons why some territories with a high incidence of cancer can have relatively low mortality due to cancer.

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