

FORM TP 2010144



TEST CODE **02207032**

MAY/JUNE 2010

C A R I B B E A N E X A M I N A T I O N S C O U N C I L

A D V A N C E D P R O F I C I E N C Y E X A M I N A T I O N

B I O L O G Y

U N I T 2 – P a p e r 0 3 / 2

A L T E R N A T I V E T O I N T E R N A L A S S E S S M E N T E X A M I N A T I O N

2 hours

**Candidates are advised to use the first 15 minutes for
reading through this paper carefully.**

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of THREE questions. Answer ALL questions.
2. The use of silent non-programmable calculators is allowed.

1. You are provided with the following apparatus and materials:

- Large beaker
- Cold water with ice
- Tripod
- Gauze
- Bunsen burner
- Matches
- Permanent marker
- Thermometer
- Germinating peas
- Dead peas
- Respirometer
 - 2 boiling tubes
 - Soda lime (avoid touching directly and inhaling)
 - Cotton wool
 - Manometer with a calibrated scale
 - Connecting tubing
 - Rubber bungs
 - 2 small perforated gauze baskets
 - Syringe
 - Rubber tubing
 - Spring clips

Use the apparatus and materials provided to plan and design an experiment to investigate the effect of temperature on the oxygen consumption of germinating peas.

(a) Formulate a suitable hypothesis for the stated investigation.

[2 marks]

(b) Write a suitable aim based on the hypothesis suggested in (a).

[1 mark]

(c) Design an experimental procedure capable of testing the hypothesis formulated in (a) on page 2. Set up the respirometer for your planned experiment using the apparatus and materials provided.

(i) In the space below make a drawing of your respirometer and experimental set-up.

[3 marks]

(ii) Briefly outline how you would conduct this experiment.

[6 marks]

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- (d) Suggest ONE precaution that must be taken when setting up the experiment.

[1 mark]

- (e) Predict the expected results from this investigation.

[1 mark]

- (f) In the space provided below, design an appropriate table to show how the results could be presented.

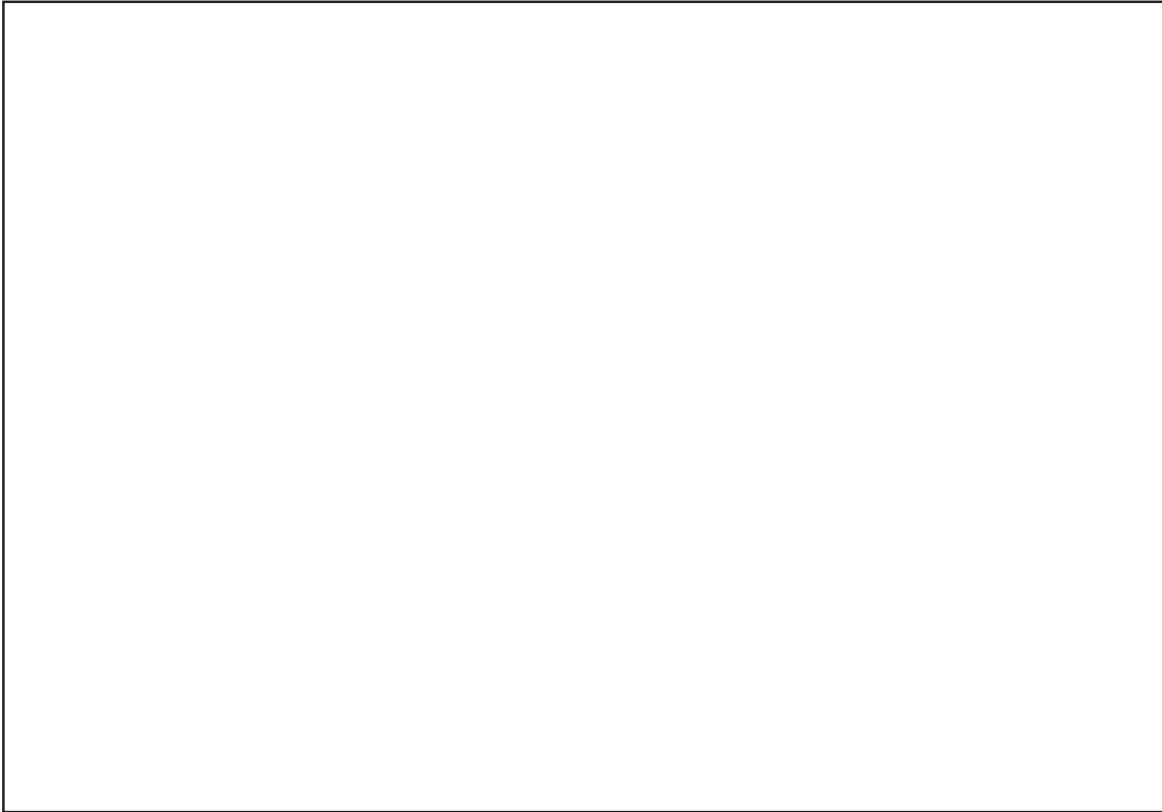
[2 marks]

Total 16 marks

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2. (a) Specimen **A** is a slide of a stained longitudinal section of a mammalian kidney. Carefully examine Specimen **A** under the low power of your microscope.

In the box below, make a labelled plan drawing to show accurately the shape of the section of the organ and the distribution of tissues in major regions of the kidney as seen in the Specimen **A**.



[8 marks]

- (b) Figure 1 is a diagrammatic representation of a photomicrograph of a longitudinal section of phloem tissue.

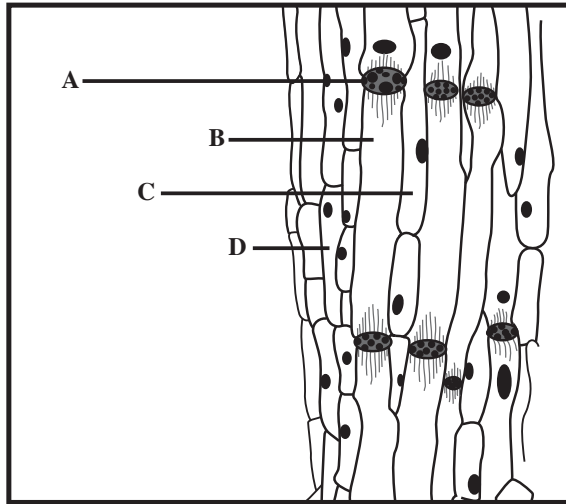


Figure 1. Diagrammatic representation of a photomicrograph of a longitudinal section of phloem tissue

Carefully examine, Figure 1 and identify the structures labelled A, B, C and D. For EACH structure identified state its main function.

A Identity _____
Function _____

B Identity _____
Function _____

C Identity _____
Function _____

D Identity _____
Function _____

[8 marks]

Total 16 marks

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3. (a) Table 1 summarizes data on mortality rates for breast cancer in women for selected countries in the region over a 30-year period. It shows the three-year moving average age-standardized breast cancer mortality rate per 100 000 women ages 25 - 74, for selected countries of the Americas, plus Puerto Rico, 1966 – 1998.

TABLE 1: DATA ON MORTALITY RATES FOR BREAST CANCER

Subregion/Country	1966 - 1968	1976 - 1978	1986 - 1988	1996 - 1998
North America				
Canada	41.9	40.0	40.5	37.0
United States ^a	38.5	39.3	39.4	36.9
Southern Cone				
Chile	19.1	20.0	21.1	20.4
Uruguay	38.7	42.8	44.5	44.6
Caribbean				
Cuba	... ^b	26.4	25.2	25.0
Puerto Rico	...	16.9	23.5	24.4
Trinidad & Tobago	29.3	23.7	39.0	32.4

Source: Pan American Health Organization, Technical Information System, 1999.

^a The figures for the United States of America do not include Puerto Rico.

^b The ellipsis symbol (...) indicates that data were not available.

- (i) Identify the country with the HIGHEST mortality rates overall for the period 1996 - 1998. Justify your answer using data provided in Table 1.

Country _____

Justification _____

[2 marks]

- (ii) Comment on the overall trend for the Caribbean countries in comparison to the North American countries.

[2 marks]

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- (iii) Suggest a possible explanation for the trend noted for Canada and the United States.

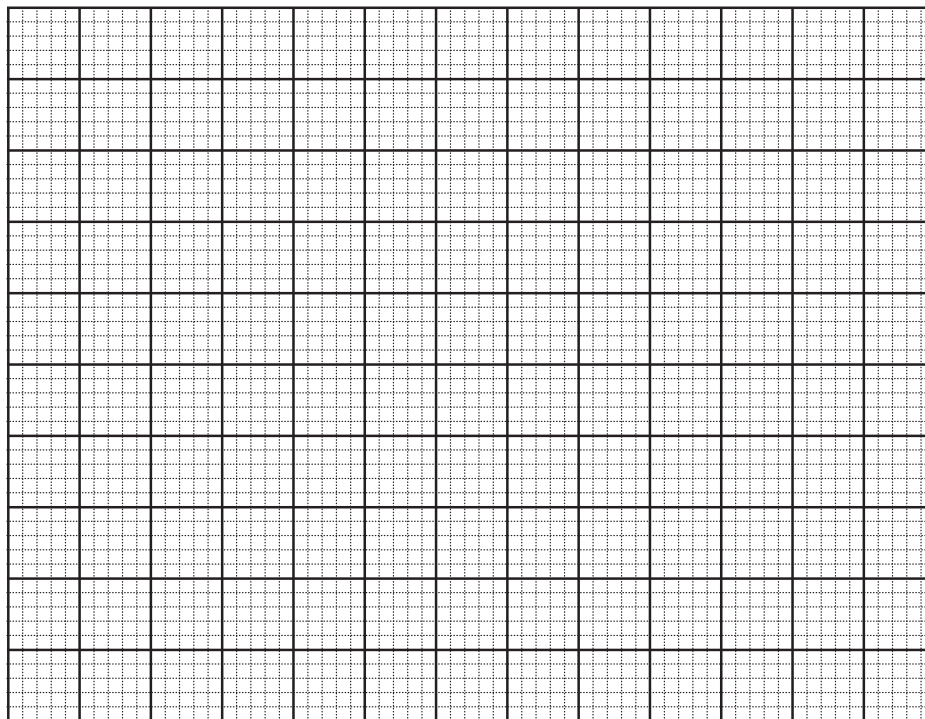
[2 marks]

- (b) Table 2 shows the number of dengue fever cases reported in Latin America and the Caribbean over the period 1980 – 2005.

TABLE 2: DATA ON DENGUE FEVER

Year	Number of cases reported
1980	90,000
1985	175,000
1990	160,000
1995	365,000
2000	400,000
2005	420,000

- (i) On the grid below, construct a bar chart to display the data given in Table 2.



[6 marks]

- (ii) Using the formula provided below, calculate the incidence rate for the period 2000 - 2005. Show your calculations.

$$\text{Incidence rate} = \frac{\text{Number of new cases}}{\text{Number reported for the period}}$$

[2 marks]

- (iii) Suggest TWO possible reasons for the increase in the number of dengue cases reported for the 1980 – 2005 period.

[2 marks]

Total 16 marks

END OF TEST