



TEST CODE **02207032**

**FORM TP 2009151**

MAY/JUNE 2009

**CARIBBEAN EXAMINATIONS COUNCIL**

**ADVANCED PROFICIENCY EXAMINATION**

**BIOLOGY**

**UNIT 2 – PAPER 03/2**

**ALTERNATIVE TO INTERNAL ASSESSMENT**

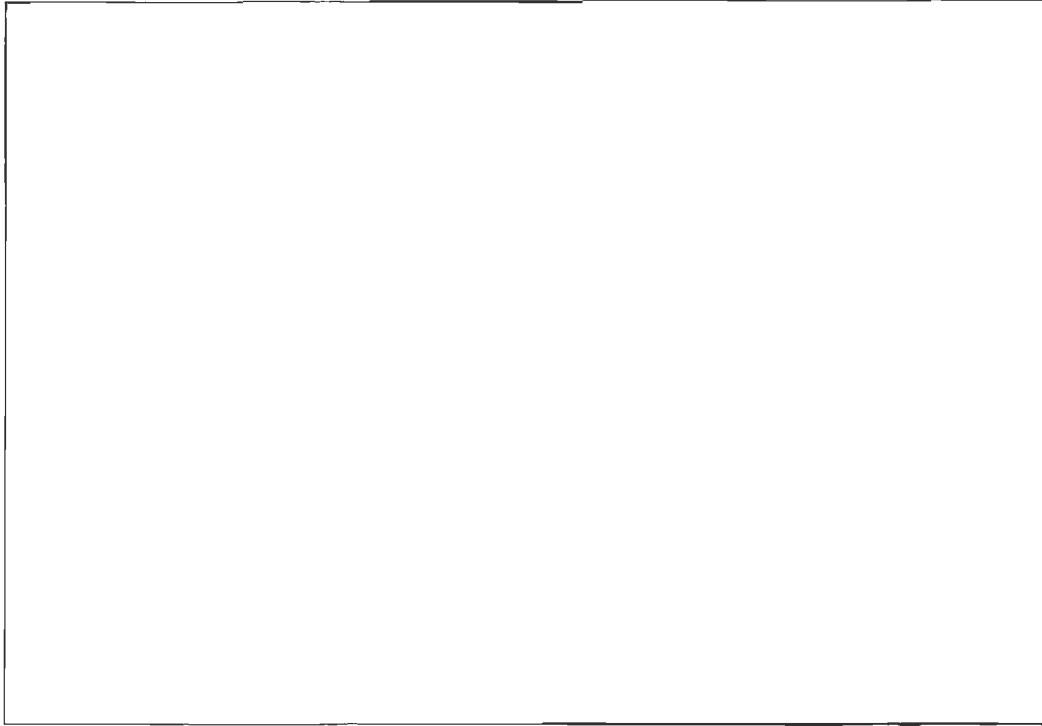
*2 hours*

**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. (a) Specimen A is a stained transverse section of a mammalian blood vessel. Examine the specimen under the low power of your microscope.
- (i) Make a labelled plan drawing of Specimen A in the box below.



[ 6 marks]

Examine Specimen A under the high power of your microscope.

- (ii) Comment on TWO features observed which are adaptations for its function in the live animal.

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[ 2 marks]

- (iii) Based on the features observed for Specimen A, what can you deduce about the nature of the blood flow in similar blood vessels in a live animal?

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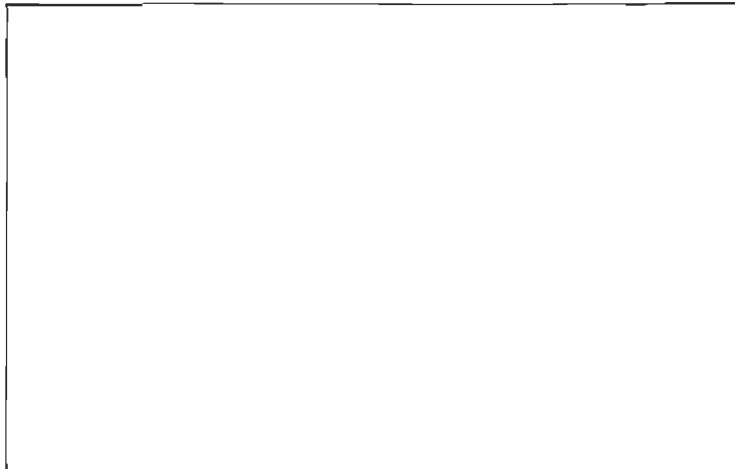
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[ 1 mark ]

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(b) Specimen B is a transverse section of a dicotyledonous leaf.

- (i) Examine the specimen and locate the mesophyll layer. Make a detailed labelled drawing of a palisade cell in the box below.



[ 5 marks]

- (ii) Compare the palisade cell with the **other MAJOR** type of cell in the mesophyll layer. Comment on **TWO** differences between them.

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[ 2 marks]

**Total 16 marks**

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

- Small glass jar
- Rubber bung (to fit jar) with two 4 mm holes and one 2 mm hole
- 2 cm<sup>3</sup> graduated pipette
- 10 cm plastic syringe
- Fresh plant cutting
- Lamp with high watt bulb
- Petroleum jelly
- Stop clock
- Sharp scissors
- Bucket of water
- Paper towel
- Black box

Use the apparatus above to plan and design an experiment to test the effect of an environmental factor on transpiration in plants.

(a) Formulate a suitable hypothesis for the factor being tested.

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[ 2 marks]

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

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[ 1 mark]

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- (c) Design an experimental procedure capable of testing the aim outlined in (b).

[ 6 marks]

(d) Suggest TWO precautions that must be taken when setting up the experiment.

- (i) \_\_\_\_\_  
\_\_\_\_\_
- (ii) \_\_\_\_\_  
\_\_\_\_\_

[ 2 marks]

(e) What results might be expected from the investigation?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

[ 1 mark ]

(f) Design an appropriate table to show how the results could be presented.

[ 2 marks]

(g) Suggest TWO factors which may affect the accuracy of the experiment described.

- (i) \_\_\_\_\_  
\_\_\_\_\_
- (ii) \_\_\_\_\_  
\_\_\_\_\_

[ 2 marks]

**Total 16 marks**

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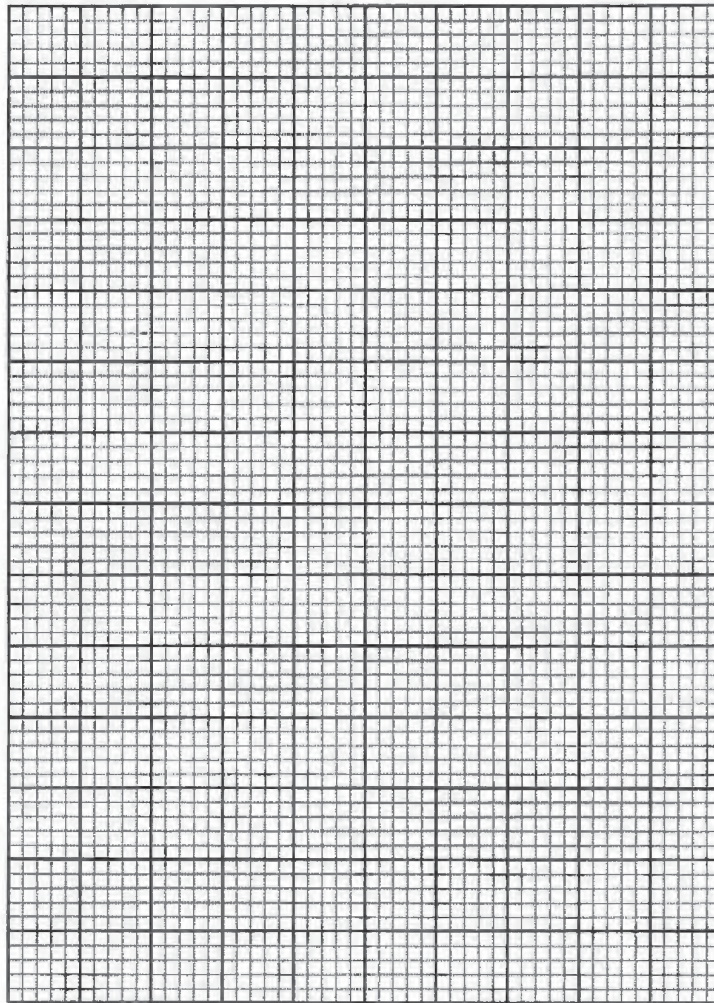
3. (a) Table 1 summarises the findings of an investigation on the effect of exercise on blood pressure in 12 human subjects following exercise on a treadmill jogger.

**TABLE 1. EFFECT OF EXERCISE ON BLOOD PRESSURE  
IN 12 HUMAN SUBJECTS (MEAN VALUES)**

Characteristic	Baseline	Measurement after exercise			
		Immediately (0 min)	15 min	30 min	60 min
Systolic blood pressure (mm Hg)	111	135	111	106	105
Diastolic blood pressure (mm Hg)	77	65	70	68	69

*Data taken from <http://www.ious.org/cgi/reprint/9/10/749.pdf>*

- (i) On Figure 1, construct a graph of blood pressure for (i) systolic and (ii) diastolic changes over 60 minutes. Include the baseline values in your graph. (Use best-fit graph lines.)



**Figure 1**

[ 7 marks]

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- (ii) Comment on the effect of exercise on blood pressure in the human subjects, using quantitative information from the graph drawn on Figure 1 on page 7.

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[ 2 marks]

- (iii) What is the physiological significance of the change in systolic pressure recorded immediately after exercise?

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[ 1 mark ]



- (b) In Guyana, cancer is among the principal causes of morbidity and mortality. Table 2 gives the incidence of cancer recorded over a five-year period.

**TABLE 2. DISTRIBUTION OF THE INCIDENCE OF CANCER BY YEAR**

YEARS	INCIDENCE RATE
2000	46.5
2001	53.0
2002	60.5
2003	77.3
2004	64.0

*Data taken from <http://www.health.gov.gy/cancer.html>*

- (i) On Figure 2, construct a histogram to display the data given in Table 2. [ 4 marks]

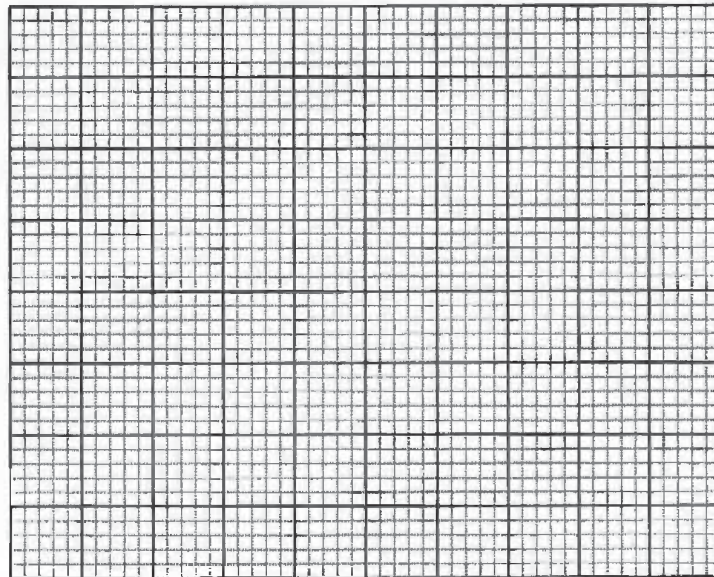


Figure 2

- (ii) Comment on the incidence of cancer over the five-year period.

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[ 2 marks]

Total 16 marks

END OF TEST

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