



TEST CODE **02207020**

MAY/JUNE 2010

**FORM TP 2010143**

**CARIBBEAN EXAMINATIONS COUNCIL**

**ADVANCED PROFICIENCY EXAMINATION**

**BIOLOGY**

**UNIT 2 – PAPER 02**

*2 hours 30 minutes*

**READ THE FOLLOWING INSTRUCTIONS CAREFULLY.**

1. This paper consists of SIX questions in two sections. Answer ALL questions.
2. For Section A, write your answers in the spaces provided in this booklet.
3. For Section B, write your answers in the space provided at the end of each question in this booklet.
4. The use of silent non-programmable calculators is allowed.

**SECTION A**

**Answer ALL questions in this section. Write your answers in the spaces provided in this answer booklet.**

- 1.** (a) (i) In the space below make an annotated schematic drawing of a chloroplast.

[ 4 marks]

- (ii) Identify and describe the TWO parts of the chloroplast that are important in the process of photosynthesis.

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[ 4 marks]

(b) Figure 1 is a diagram of the nitrogen cycle.

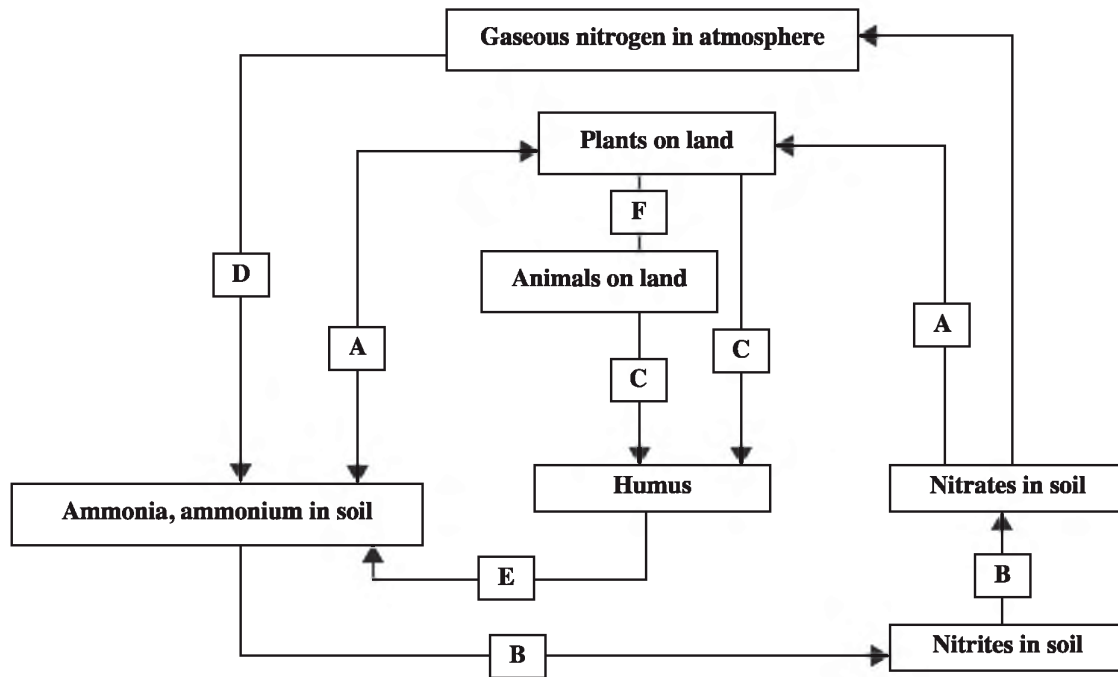


Figure 1. Nitrogen cycle

(i) Identify the processes in Figure 1 represented by the letters A, B, C, D, E and F.

- A \_\_\_\_\_
- B \_\_\_\_\_
- C \_\_\_\_\_
- D \_\_\_\_\_
- E \_\_\_\_\_
- F \_\_\_\_\_

[ 3 marks]

- (ii) Describe TWO NATURAL ways by which nitrogen is lost from soil ecosystems.

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[ 2 marks]

- (iii) Describe TWO human activities which impact the nitrogen cycle.

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[ 2 marks]

**Total 15 marks**

2. (a) Figure 2 shows apparatus that was used to investigate the distribution of stomata on the upper and lower parts of a leaf.



**Figure 2. Apparatus for investigating stomata distribution in a leaf**

*Biological Sciences 1 and 2, 3rd Edition, p. 439*

- (i) Explain FOUR precautions that should be taken when setting up and conducting this experiment.

[ 4 marks]

- (ii) From which surface will the water loss most likely be GREATER?

[ 1 mark ]

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(iii) Suggest an appropriate control for the experiment.

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[ 1 mark ]

(b) Identify THREE factors that affect the closing and opening of stomata, and explain how these factors function.

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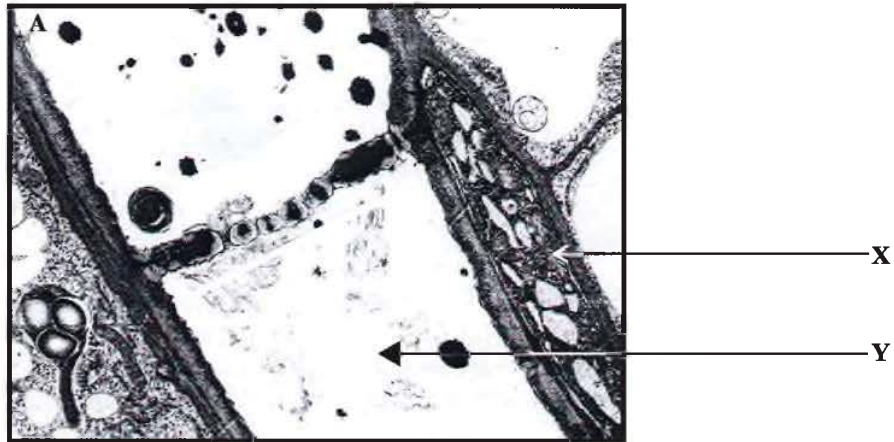
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[ 3 marks ]

(c) Figure 3 shows an electron micrograph of a plant structure.



**Figure 3. Electron micrograph of a plant structure**

*Roberts M., Reiss M. and Monger B., Advanced Biology.  
Nelson 2000, p. 259.*

(i) Identify the structures labelled X and Y in Figure 3.

X: \_\_\_\_\_

Y: \_\_\_\_\_

[ 1 mark ]

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- (ii) Discuss TWO structural differences between the cells labelled X and Y and describe how, in spite of these differences, they function as a unit.

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[ 4 marks]

- (iii) Name ONE route by which substances move from the chloroplast in leaves to the phloem.

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[ 1 mark ]

**Total 15 marks**

3. (a) (i) Define the term 'health'.

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[ 1 mark ]

- (ii) A breakdown of health may lead to disease. Differentiate between EACH of the categories of disease listed below, with respect to the cause of the diseases.

Physical and mental

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Infectious and non-infectious

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Deficiency and inherited

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[ 3 marks]

- (iii) Explain the difficulty in classifying protein-energy malnutrition as a non-infectious, physical, deficiency disease.

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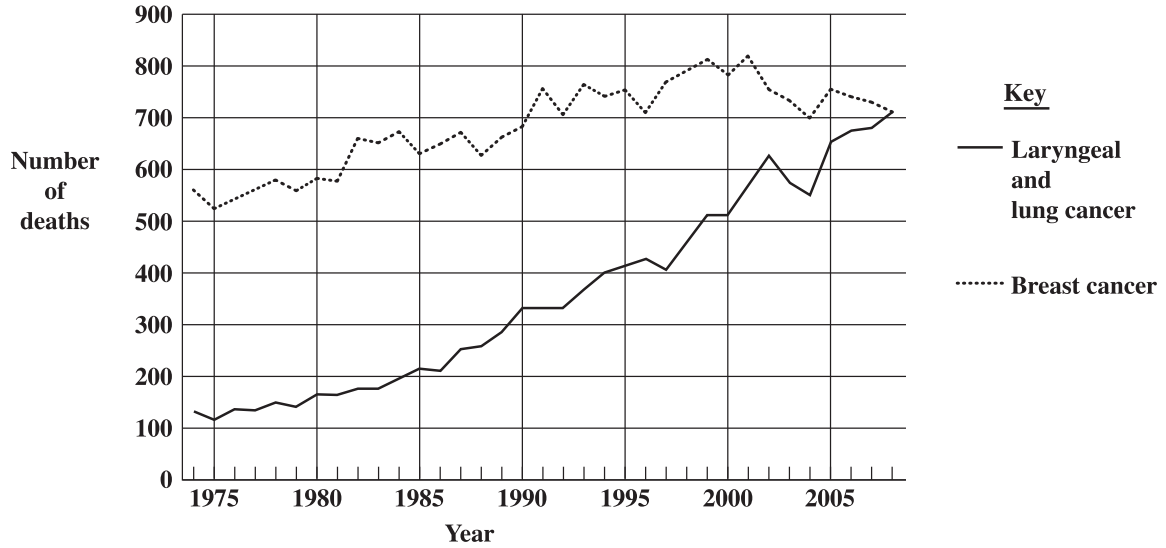
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[ 3 marks]



- (b) Figure 4 presents data on the number of deaths that occurred in women from laryngeal and lung cancer and breast cancer for the period 1975–2005, in a country.



**Figure 4. Deaths in women for the period 1975 - 2005**

- (i) Discuss the curves for laryngeal and lung cancer, and breast cancer.

Laryngeal and lung cancer

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Breast cancer

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[ 4 marks]

T O

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[ 2 marks]

O T O C

[ 2 marks]

Total 15 marks

SECTION B

Answer ALL questions. Write your answers in the spaces provided at the end of each question.

- 4. (a) (i) Explain what is meant by the term 'glycolysis' and state where it takes place in  
[ 4 marks]

A



[ 4 marks]

E

[ 3 marks]

- (c) Comment on the significance of ATP and NADPH<sub>2</sub> [ 4 marks]

**Total 15 marks**

Write your answer to Question 4 here.

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5.

ON

[ 5 marks]

A

E

[ 4 marks]

O T O

[ 2 marks]

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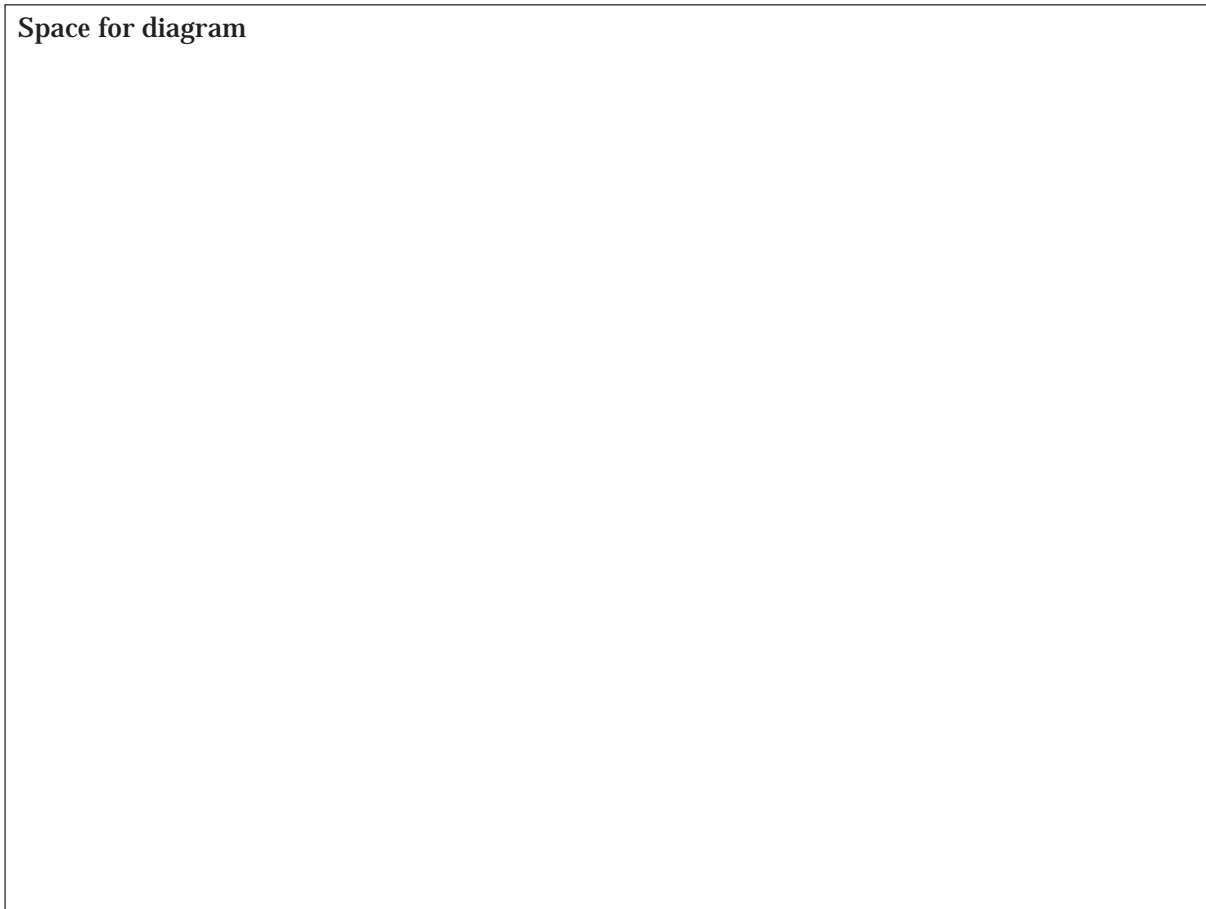
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[ 4 marks]

Total 15 marks

Write your answer to Question 5 here.

Space for diagram



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Write your answer to Question 5 here.

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Write your answer to Question 6 here.

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Write your answer to Question 6 here.

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**END OF TEST**

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