

Centre Number	Candidate Number

Candidate Name _____

EXAMINATIONS COUNCIL OF ZAMBIA

**Joint Examination for the School Certificate
and General Certificate of Education Ordinary Level**

BIOLOGY PAPER 2

5090/2

Wednesday

14 NOVEMBER 2001

1 hour 45 minutes

**Additional materials:
Answer paper**

1 hour 45 minutes

INSTRUCTIONS TO CANDIDATES

Write your **name**, centre number and candidate number in the spaces at the top of this page and on all separate answer paper used.

Section A

Answer **all** questions

Write your answers in the spaces provided on the question paper.

Section B

Answer any **three** questions.

Write your answers on the separate answer paper provided.

At the end of the examination:

- 1. fasten the separate answer paper securely to the question paper;**
- 2. enter the numbers of the Section B questions you have answered in the grid below, under section B.**

INFORMATION FOR CANDIDATES

The intended number of marks is given in brackets

[] at the end of each question or part question.

You are advised to spend no longer than one hour on
Section A and no longer than 45 minutes on Section B.

QUESTION ANSWERED	
Section A	
Section B	
Total	

Section A

Answer all questions in this section.

- 1 Figure 1 shows the parts of a wind-pollinated flower.

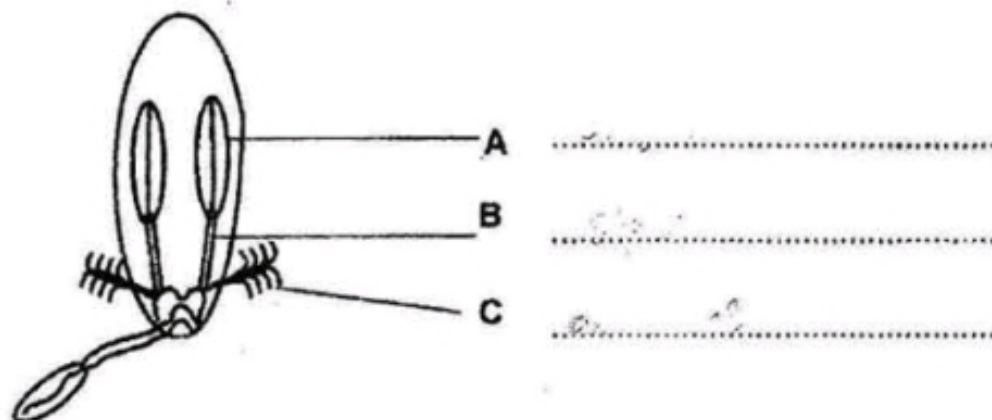
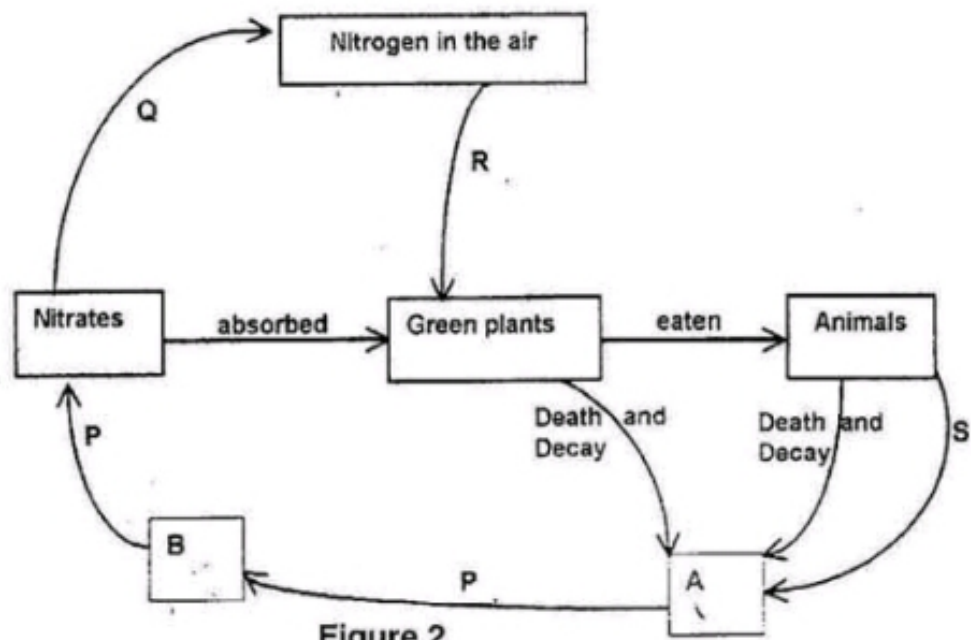


Figure 1

- (a) Name the parts shown by the letters on the diagram. [3]
- (b) Which **two** structural features in the diagram confirm its adaptation for wind pollination?
- (i)
- (ii) [2]
- (c) Explain how the **two** features you mentioned in (b) assist the mechanism of wind pollination.
-
-
- [2]
- (d) Which feature prominent in Figure 1 is not necessary in an insect-pollinated flower?
-
- [1]

[Total: 8]

2 Figure 2 represents the Nitrogen Cycle.



(a) (i) What is the percentage of nitrogen in the air?

[1]

(ii) Name the **two** substances **A** and **B**.

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A

B

[2]

(iii) Name the **three** processes represented by the letters **P**, **Q** and **R**.

P

Q

R

(iv) Which process in living animals is represented by the letter **S**?

[1]

(b) (i) Suggest why it is essential to include a leguminous crop in crop rotation.

.....

.....

.....

[1]

(ii) What are the **three** advantages of using organic manure as compared to the use of chemical fertilizers?

1

.....

2

.....

3

.....

[3]

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[Total: 11]

3 (a) (i) What is meant by the term **homeostasis**?

.....

.....

.....

[1]

(ii) Name two functions of the liver which contribute to homeostasis.

.....

.....

[2]

(b) The graph in Figure 3 shows the effects of exercising and immersion in cold water on human body temperature.

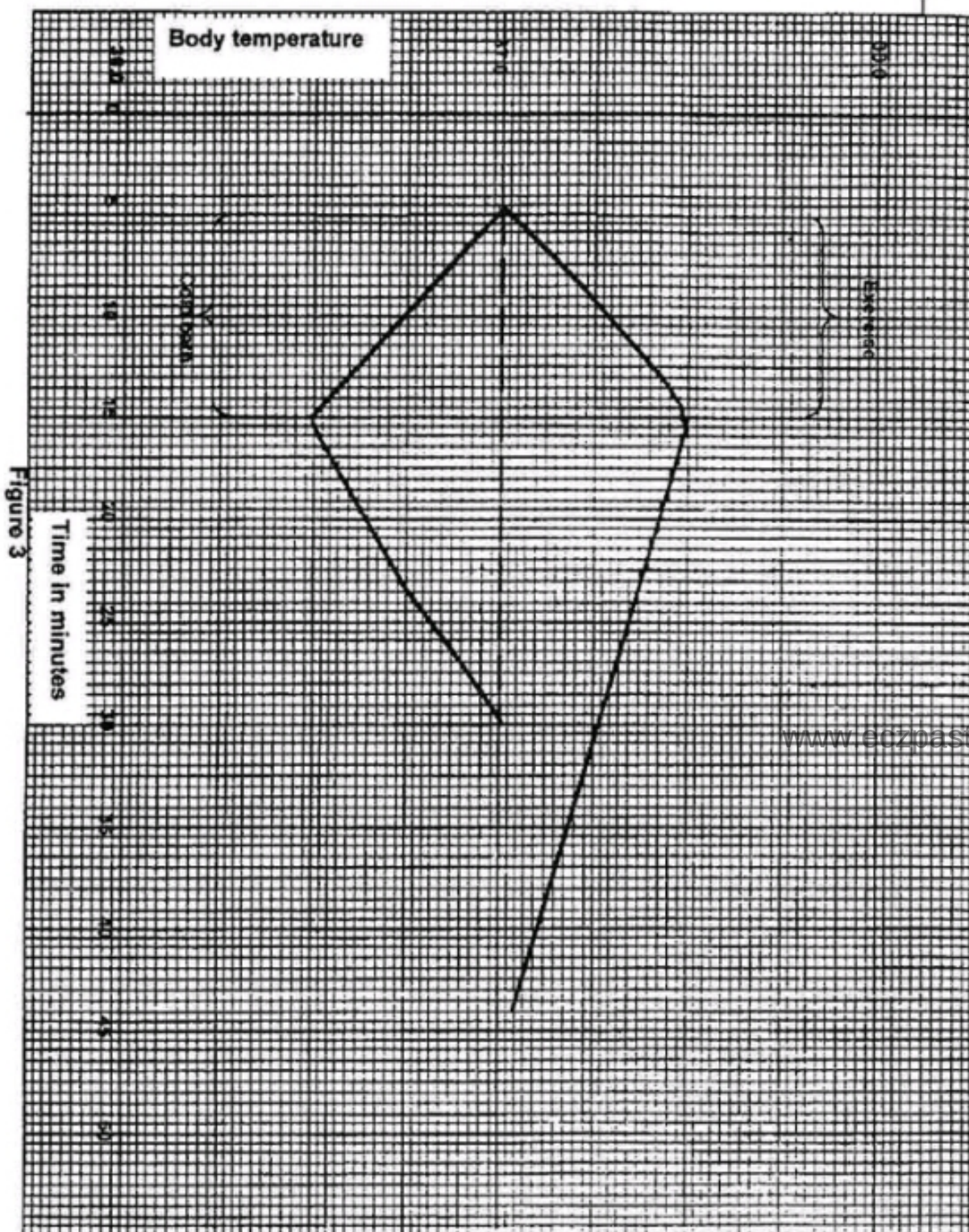


Figure 3

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- (i) What was the body temperature after 10 minutes exercise and 10 minutes immersion in cold water?

After 10 minutes of exercise [1]

After 10 minutes of cold bath..... [1]

- (ii) How long did the temperature take to return to normal after exercise, and after the cold bath?

After exercise [1]

After the cold bath [1]

- (iii) Explain what causes body temperature to rise during exercise.

.....

.....

..... [1]

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- (c) Describe the effects of **overcooling** on the skin.

.....

.....

.....

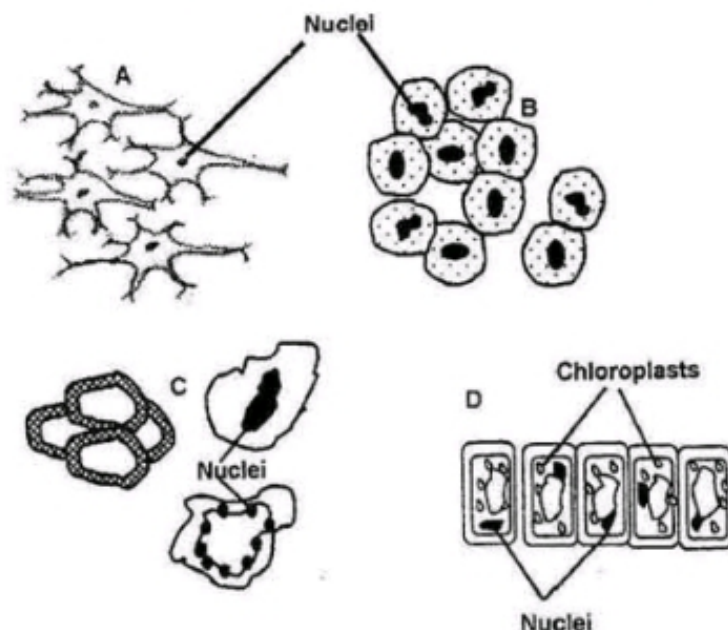
.....

.....

..... [2]

[Total: 10]

4 Figure 4 shows some of the plant and animal tissues. They are not drawn to scale.



(a) (i) For each of the tissues **A** and **D** state whether it is an animal or a plant tissue.

Tissue A

Tissue D [2]

(ii) Give reasons for your answer in (a) (i) above.

Plant

Animal

(iii) Give the names of tissues **B** and **C**.

Tissue B

Tissue C [2]

(b) In which part of an animal or plant would you expect to find tissues **A** and **D**?

Tissue A

Tissue D [2]

[Total: 8]

- 5 Both Mrs Banda and Mrs Bwalya delivered baby girls on the same day, in the same hospital. Mrs Banda's baby girl was named Anansi and Mrs Bwalya's baby girl was named Bupe. Mrs Bwalya began to suspect that her baby had been accidentally exchanged with Mrs Banda's baby at the hospital. Blood tests were done on the two families.

Results of the blood tests were as follows:

Name	Blood Group
Mr Banda	A
Mrs Banda	B
Baby Anansi	O
Mr Bwalya	A
Mrs Bwalya	A
Baby Bupe	B

I^A , I^B and I^O are the alleles of the gene which controls human blood groups. Use these symbols to answer the questions.

- (a) Using full genetic diagrams, show whether there was a mix up or not.

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- (i) Genetic Diagram I – Mrs Bwalya and Mr Bwalya

(ii) Genetic Diagram II – Mrs Banda and Mr Banda

[3]

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(iii) Conclusion from the genetic diagrams

[1]

- (b)** From your knowledge of human blood groups, which blood group shows codominance?

[1]

[Total: 8]

Section B

Answer any **three (3)** questions from this section.

- 6 (a) (i) Explain what is meant by the term **photosynthesis**. [2]
- (ii) Give an equation summarizing the process of **photosynthesis**. [3]
- (b) How are the products of photosynthesis distributed to the rest of the plant? [3]
- (c) How does photosynthesis benefit:
- (i) a caterpillar?
- (ii) a bird of prey? [4]

[Total 12]

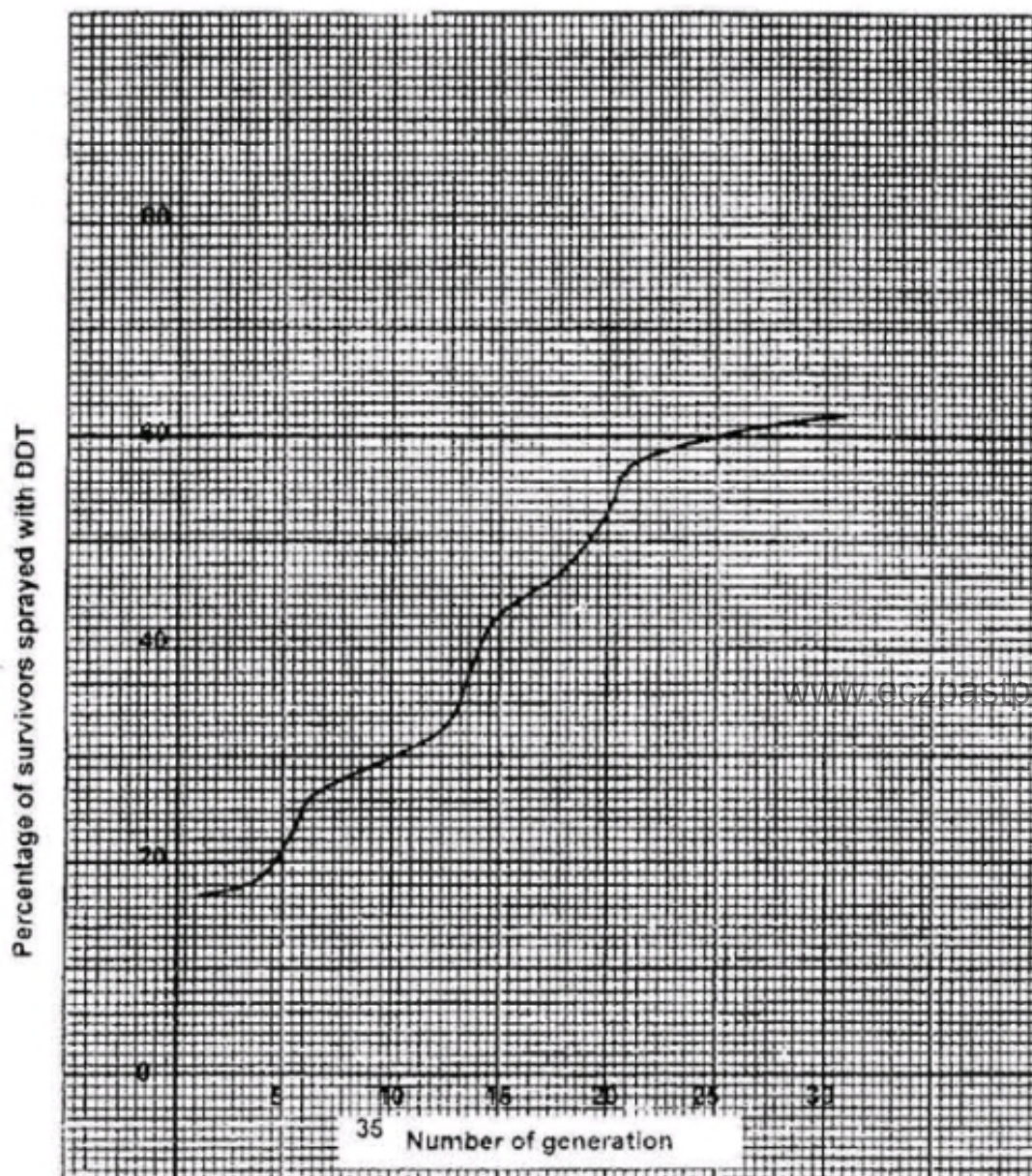
- 7 (a) (i) What significant change occurs in a human's eye structures when he/she moves from a brightly lit room to a dark room? [3]
- (ii) A pupil is comfortably seated at the back of the classroom reading a book. Then the teacher suddenly asks the pupil to go and label a part on the chart in front of the classroom. What changes occur in this pupil's eyes in order to focus on the chart? [3]
- (b) **Compare** and **contrast** plant and animal hormones. [6]

[Total: 12]

- 8 (a) Describe how mammals digest:
- (i) starch [8]
- (ii) protein [4]
- (b) What is the fate of the products of (a) (i) and (ii)? [4]

[Total: 12]

- 9 **DDT** is a well known insecticide. An experiment was carried out where a number of flies were sprayed with **DDT**. The survivors were allowed to reproduce and the offsprings sprayed. This was repeated for several more generations and the data expressed in a graph in figure 5.



- (a) What is the biological explanation for the trend shown by the graph? [6]
- (b) DDT is a non-biodegradable insecticide. What does the underlined word mean? [2]
- (c) What effect does a **non-biodegradable** substance like **DDT** have on the environment? [2]
- (d) Explain what the surviving flies of the 25th generation had gone through.

[Total: 12]

- 10 (a) What are the **biological** disadvantages of a **sexual** reproduction? [2]
- (b) Explain the events leading to **fertilization** in flowering plants. [6]
- (c) Describe the role played by **progesterone** in pregnancy in humans. [4]
- [Total: 12]

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