



**BOTSWANA EXAMINATIONS COUNCIL**  
Botswana General Certificate of Secondary Education

CANDIDATE  
NAME

CENTRE  
NUMBER

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**BIOLOGY**

**0572/03**

Paper 3

**October/November 2014**

**1 hour 15 minutes**

Additional Materials: Answer Paper

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name in the spaces provided at the top of this page.  
**DO NOT WRITE IN ANY BARCODES.**

**Section A**

Answer **all** questions.

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

**Section B**

Answer **both** questions.

Write your answers on the separate answer paper provided.

Write your Centre number, candidate number and name on each sheet of answer paper you use.

At the end of the examination fasten all sheets of answer paper to this question paper using the string provided.

You may use a calculator.

Do not use staples, paper clips, highlighters, glue or correction fluid.

The number of marks is given in brackets [ ] at the end of each question or part question.

You are advised to spend no longer than 40 minutes on section A.

For Examiner's Use	
Section A	
Section B	
7	
8	
<b>TOTAL</b>	

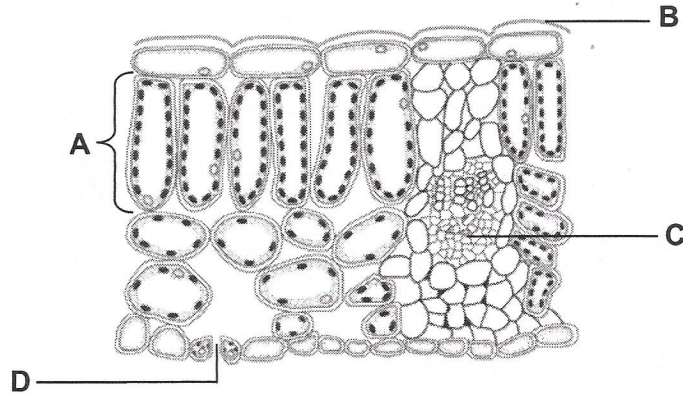
This document consists of **9** printed pages and **3** blank pages.



**Section A**

Answer all questions in this section in the spaces provided.

1 Fig. 1.1 shows a section through a leaf.



**Fig. 1.1**

(a) Identify parts **B** and **C**.

**B** .....

**C** ..... [2]

(b) (i) Explain why photosynthesis occurs mainly in tissue **A**.

.....  
.....  
..... [2]

(ii) Explain the significance of opening **D** in photosynthesis.

.....  
.....  
..... [3]

(c) Suggest and explain how the rate of photosynthesis would be affected if a plant was placed in a well-lit, cold room.

.....  
.....  
..... [3]

[Total: 10]

- 2 Table 2.1 shows a list of some parts of the human reproductive system and their functions. Match each part with its function using a line. The first one has been done for you.

Table 2.1

part	function
mammary glands	where the foetus develops
oviduct	deposits semen into the female
testis	secrete milk to nourish young ones
penis	transports egg cells from the ovary
uterus	produces male gametes
	stores male gametes

[Total: 4]



3 Fig. 3.1 shows a network of capillaries in a human tissue.

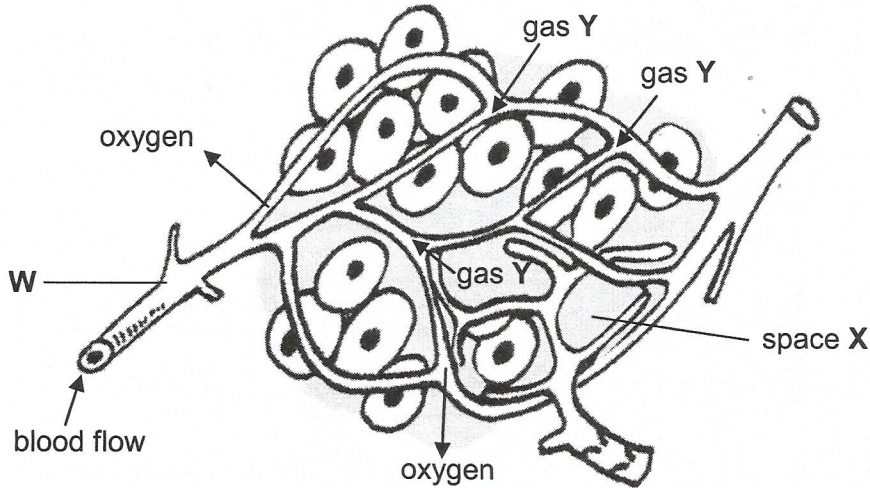


Fig. 3.1

(a) Identify blood vessel **W** and fluid in space **X**.

vessel **W** .....

fluid in space **X** .....[2]

(b) Gas **Y** moves into blood vessels as shown by arrows in Fig. 3.1.

(i) State the process by which gas **Y** moves in the direction shown.

.....[1]

(ii) Which metabolic process produces gas **Y**?

.....[1]

(c) (i) Describe how oxygen is carried in the blood.

.....  
 .....  
 .....  
 .....[2]

(ii) Name **one** other substance that moves in the same direction as oxygen in Fig. 3.1.

.....[1]

[Total: 7]

4 An alveolus is a part of an organ in the body.

(a) Name the organ in which an alveolus is found.

.....[1]

(b) Explain how any **two** features of the alveoli enable them to perform their function efficiently.

.....  
.....  
.....  
.....[3]

(c) Name a disease which results from the bursting of the alveoli.

.....[1]

[Total: 5]



- 5 Fig. 5.1 is a bar graph showing the chemical elements that make up three components of diet, fats, proteins and carbohydrates. The three components are represented by letters **E**, **F** and **G**, but not necessarily in that order.

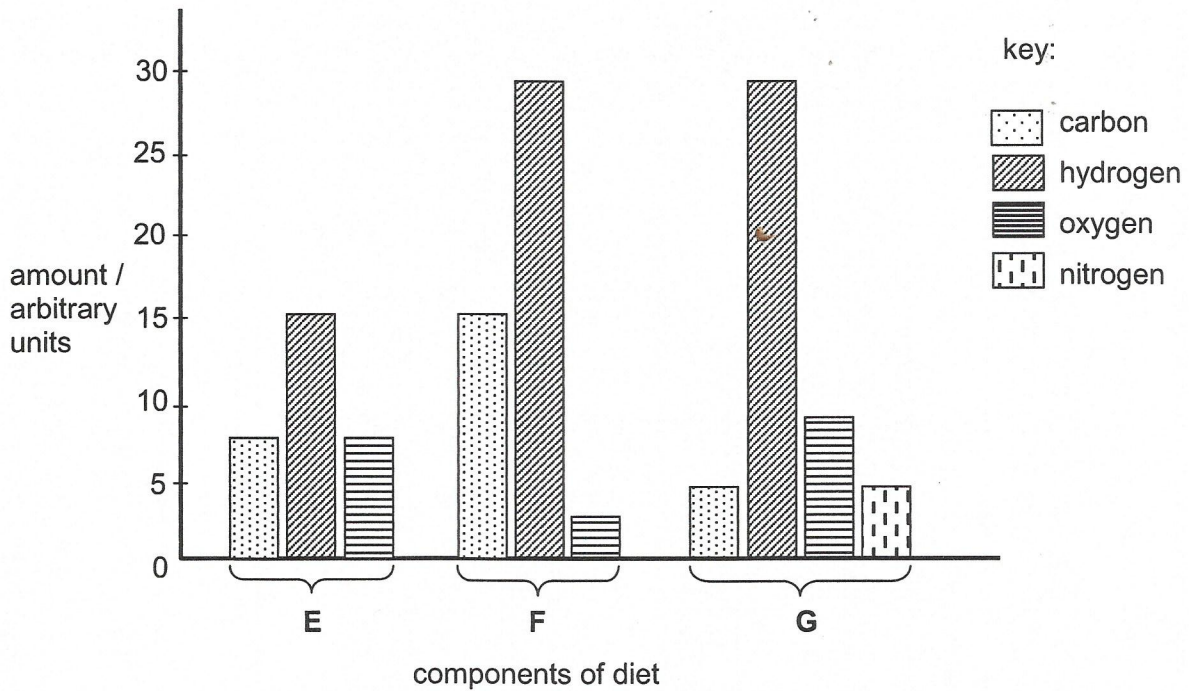


Fig. 5.1

- (a) Identify the components of diet **E** and **G**. In each case give a reason for your answer.

component **E**.....  
 reason.....  
 .....[2]

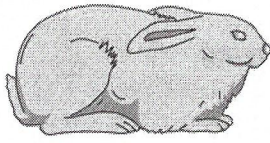
component **G**.....  
 reason.....  
 .....[2]

- (b) Which component of diet **E**, **F** or **G**, is made up of the same chemical elements as an enzyme?  
 .....[1]

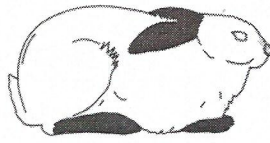
- (c) Define a balanced diet.  
 .....  
 .....[2]

[Total: 7]

6 Fig. 6.1 shows three possible coat colours of domestic rabbits.



full coat colour



Himalayan



albino

Fig. 6.1

Coat colour in domestic rabbits is controlled by three alleles, though only two can be present in a genotype. The alleles are represented as follows:

$C^g$ , allele for full coat colour, the rabbit is grey in colour,

$C^w$ , allele for Himalayan, rabbit has a white coat with black ears and feet,

$C^a$ , allele for albino, rabbit is all white in colour.

The allele for full coat colour  $C^g$ , is dominant to both the allele for Himalayan  $C^w$ , and that for albino  $C^a$ . The allele for an albino is recessive to both alleles for full coat colour and Himalayan.

(a) With the aid of a genetic diagram below, determine the percentage chance of a full coat colour rabbit and a Himalayan rabbit having an albino offspring.

parental phenotype: full coat colour x Himalayan

parental genotype:  $C^{\dots} C^{\dots}$  x  $C^{\dots} C^{\dots}$

gametes: 

offspring genotype: ....., ....., ....., .....

offspring phenotype: ....., ....., ....., .....

percentage chance of an albino offspring ..... % [5]

(b) A farmer has a rabbit with full coat colour, but does not know its genotype. Suggest how the farmer may determine the genotype of the rabbit.

.....  
 .....  
 ..... [2]

[Total: 7]



## Section B

Answer **both** questions.

Write your answers on the separate answer paper provided.

- 7 (a) (i) Distinguish between asexual and sexual reproduction. [2]
- (ii) State **three** advantages to a grower of using asexual reproduction to propagate her plants. [3]
- (b) Gonorrhoea and HIV/AIDS are human sexually transmitted diseases.
- (i) Describe the signs and symptoms of gonorrhoea and its long term effects on the body. [6]
- (ii) Explain why the methods of treatment of gonorrhoea cannot be used for the treatment of HIV/AIDS. [3]
- (iii) State **one** of the methods which can be used to control the spread of HIV/AIDS. [1]

[Total: 15]

8 Fig. 8.1a and Fig. 8.1b show two animals, which belong to the same group.

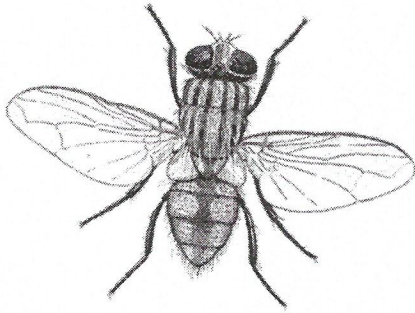


Fig. 8.1a

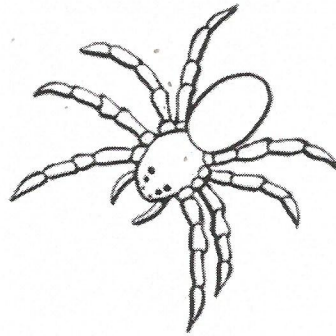


Fig. 8.1b

- (a) (i) Suggest the name of the major group to which the two animals belong. [1]
- (ii) State any **two** observable similarities which enabled you to identify their group. [2]
- (b) Animals within the same group can still differ in structure.

State **four** observable differences between the animals shown in Fig. 8.1a and Fig. 8.1b. [4]

- (c) Insects are major agents of pollination in flowering plants.
- Describe how flowers are adapted for pollination by insects. [3]

- (d) Farmers sometimes use chemicals to protect their crops from insects.
- State **and** explain the disadvantages of using chemicals to kill insects. [5]

[Total: 15]

