



BOTSWANA EXAMINATIONS COUNCIL
Botswana General Certificate of Secondary Education

CANDIDATE
NAME

CENTRE
NUMBER

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NUMBER

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BIOLOGY

0572/03

Paper 3

October/November 2017

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	
6	
7	
TOTAL	

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 the human eye.

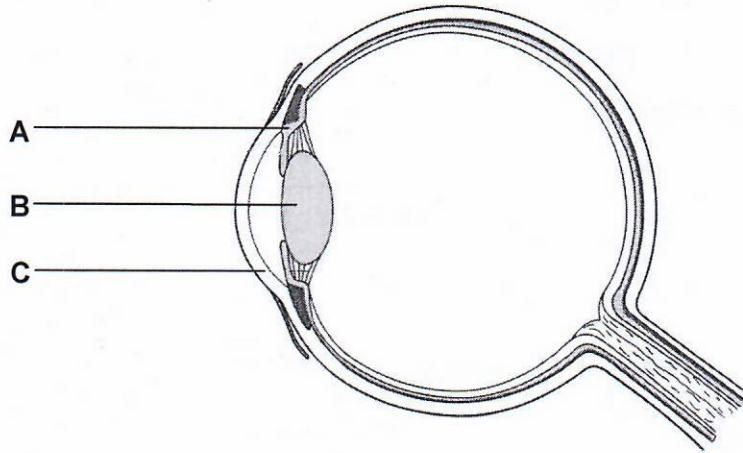


Fig. 1.1

(a) Identify structures **A**, **B** and **C**.

A

B

C

[3]

(b) Describe the changes that take place in structures **A** and **B**, when a person looks at a near object.

.....

.....

.....

.....

.....

.....

[4]

(c) (i) State **one** reflex action that occurs in the eye.

..... [1]

(ii) Suggest a reason for the reflex action stated in (c) (i).

..... [1]

[Total: 9]



2 Lactose intolerance is a condition caused by a recessive allele represented by letter q .

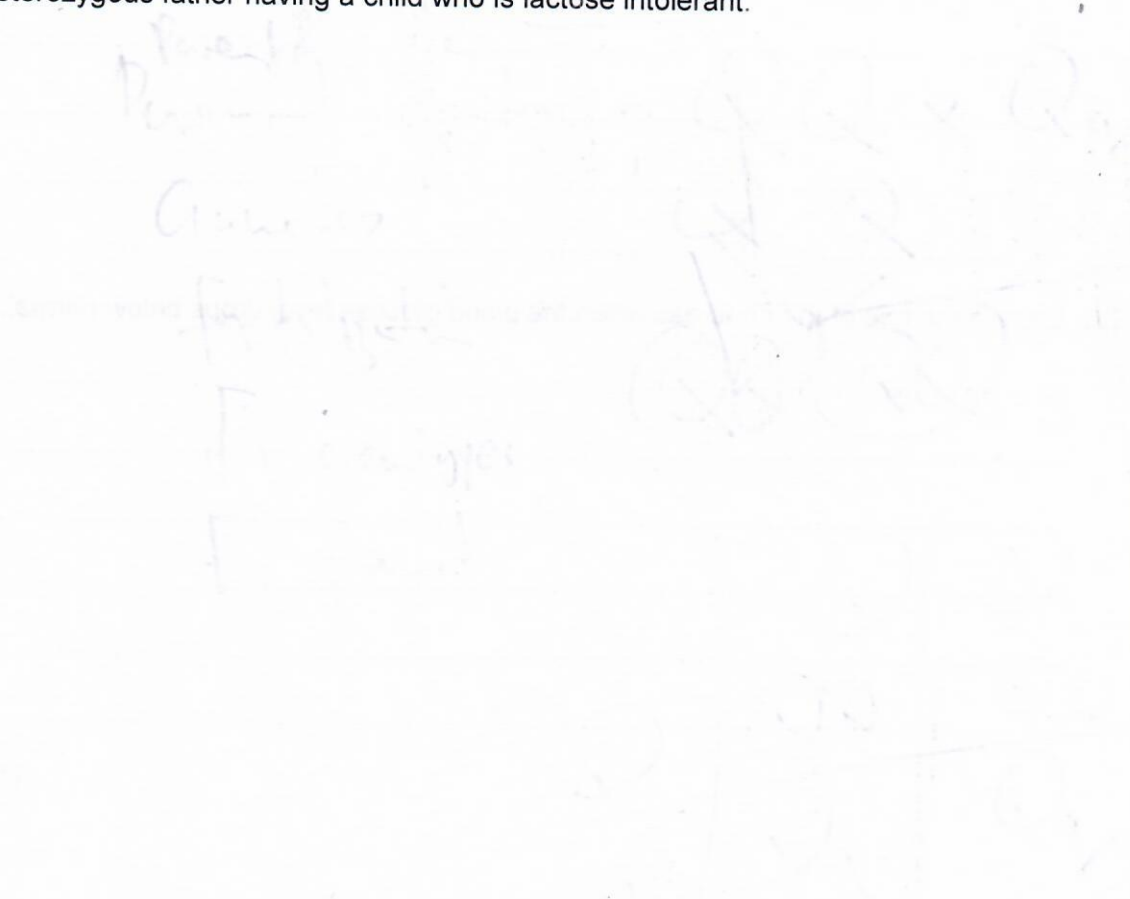
(a) State the **two** possible genotypes of an individual who is **not** lactose intolerant.

1.

2.

[2]

(b) Using a genetic diagram, determine the chance of a homozygous dominant mother and a heterozygous father having a child who is lactose intolerant.



[5]

[Total: 7]



3 (a) (i) Name the part of the human brain that is involved in temperature regulation.

..... [1]

(ii) Describe the role played by blood vessels in the human skin, when the body temperature rises above normal.

.....
.....
.....
.....
.....
.....
..... [4]

(b) Explain the role of the pancreas when the blood glucose level drops below normal.

.....
.....
.....
.....
.....
..... [4]

[Total: 9]



4 Fig. 4.1 shows part of a food web from a woodland.

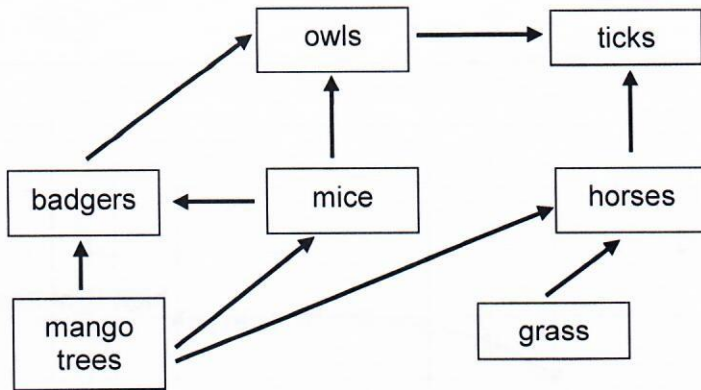


Fig. 4.1

(a) State the principal source of energy for the web shown in Fig. 4.1.

..... [1]

(b) Using Fig. 4.1, identify an organism that is

(i) both a primary and secondary consumer,

..... [1]

(ii) a tertiary consumer.

..... [1]

(c) (i) Suggest the effect of killing all badgers on the population of mice.

..... [1]

(ii) Give an explanation to your answer in (c) (i).

..... [2]

[Total: 6]



- 5 Fig. 5.1 is a graph showing the effect of carbon dioxide concentration and light intensity on the rate of photosynthesis.

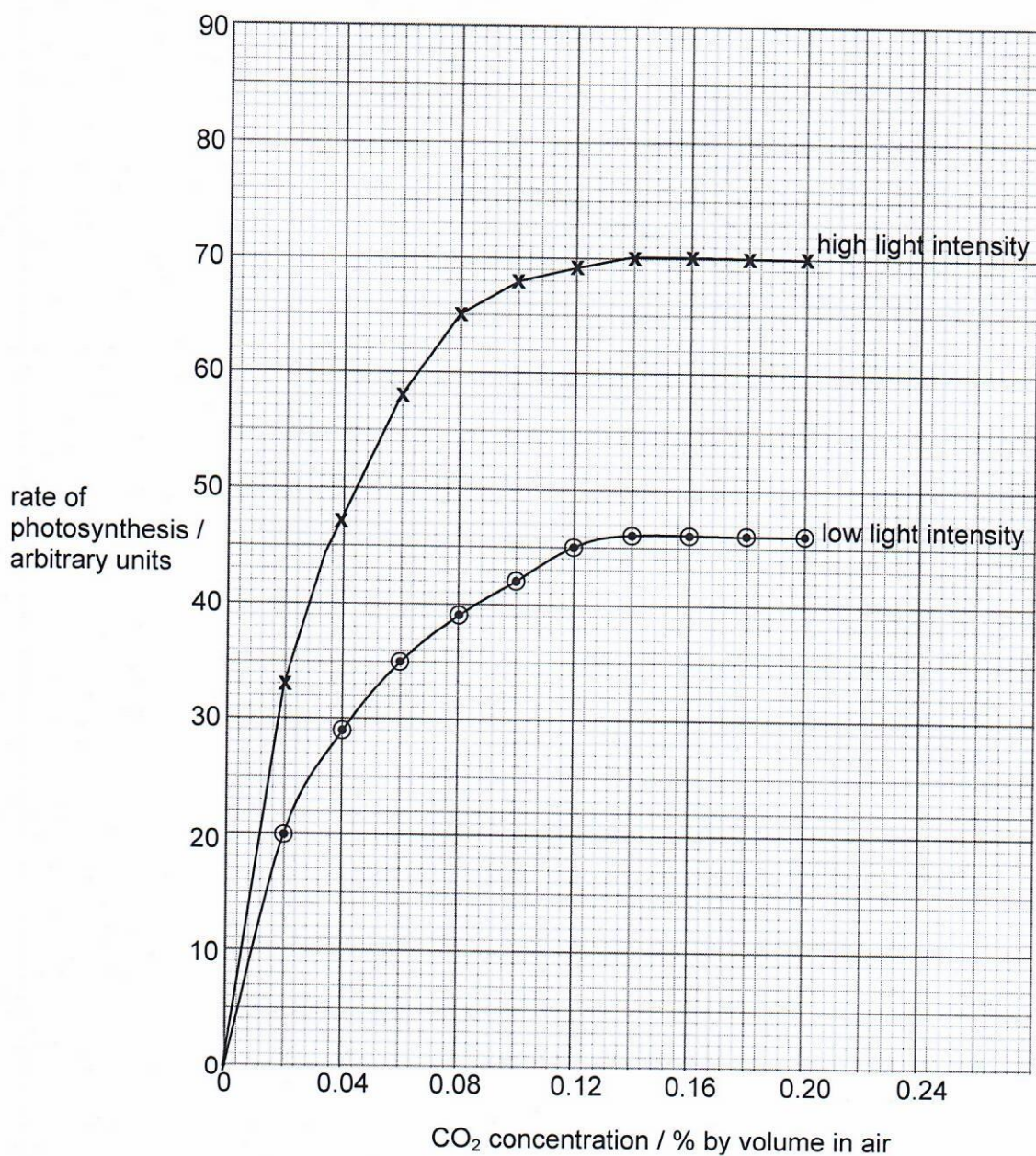
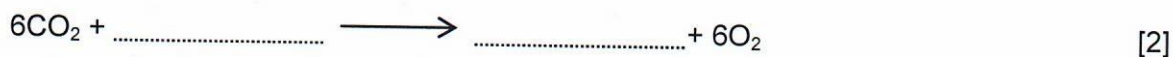


Fig. 5.1

- (a) Complete the following symbol equation for photosynthesis.



- (b) (i) From Fig. 5.1, find the rate of photosynthesis at 0.03% carbon dioxide when light intensity is low and when it is high.

light intensity low

light intensity high

[2]

(ii) State a conclusion about the effect of light intensity on the rate of photosynthesis, that can be drawn from the information in Fig. 5.1.

.....
..... [1]

(iii) Suggest an explanation for the conclusion given in (b) (ii).

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

(c) State **one** factor, other than carbon dioxide concentration and light intensity, that can affect the rate of photosynthesis.

..... [1]

[Total: 9]



Section B

Answer **both** questions.

Write your answers on the separate answer paper provided.

- 6 Fig. 6.1 shows a longitudinal section of one side of the heart.

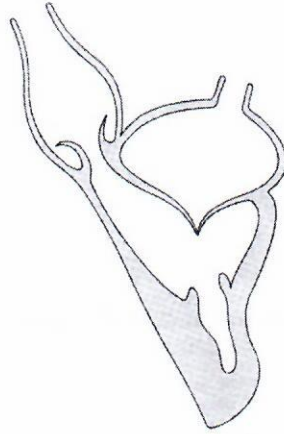


Fig. 6.1

- (a) State **two** observations from Fig. 6.1 which suggest that the ventricle is emptying. [2]
- (b) Describe the changes that take place in the activity of the heart during vigorous exercise, and explain why these changes are necessary. [5]
- (c) Describe how cigarette smoking increases the risk of coronary heart disease. [5]
- (d) Humans have a dual circulation system. Suggest the value of a dual circulation system to humans. [3]

[Total: 15]



7 (a) Distinguish between aerobic respiration and anaerobic respiration.

[3]

(b) Fig. 7.1 shows a section through an alveolus and a surrounding blood capillary.

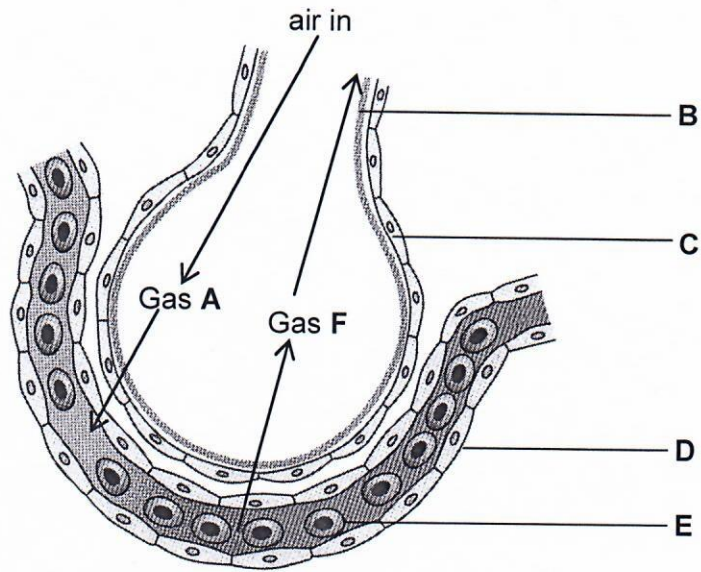


Fig. 7.1

With reference to labels A to F shown in Fig. 7.1, discuss gaseous exchange. In your answer, identify A to F.

[12]

[Total: 15]



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