



BOTSWANA EXAMINATIONS COUNCIL
 in collaboration with
 UNIVERSITY OF CAMBRIDGE LOCAL EXAMINATIONS SYNDICATE
 Botswana General Certificate of Secondary Education

CANDIDATE
NAME

CENTRE
NUMBER

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CANDIDATE
NUMBER

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BIOLOGY

0572/03

Paper 3

October/November 2012

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 (a) Define the term *hormone*.

.....

 [2]

(b) Fig. 1.1 shows some endocrine glands in the human body.

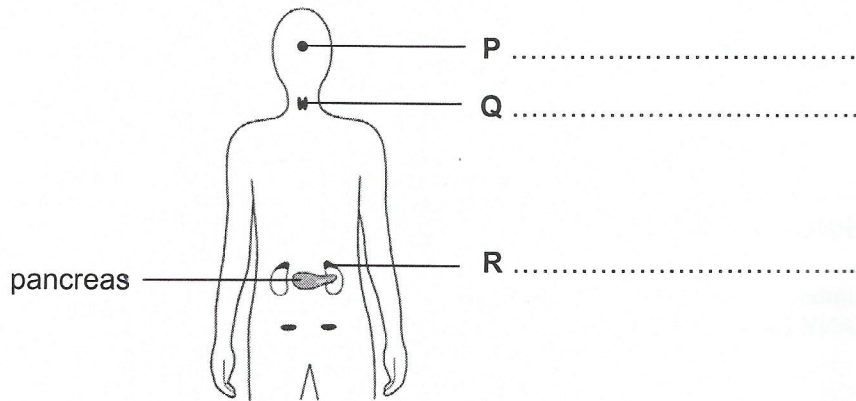


Fig. 1.1

(i) On Fig. 1.1, name the glands **P**, **Q** and **R**.

[3]

(c) Five human hormones and their functions are shown in boxes below, but not necessarily matched. Draw a straight line to match each hormone with its function. One has been done for you.

hormone	function
adrenaline	makes the liver convert excess glucose to glycogen
insulin	keeps the lining of the uterus thick
oestrogen	prepares the body for flight or fight
progesterone	controls the development of male secondary sexual characteristics
testosterone	causes the thickening of the uterus lining

[4]

[Total: 9]

2 Fig. 2.1 is a simplified diagram of the human digestive system, showing regions A to F.

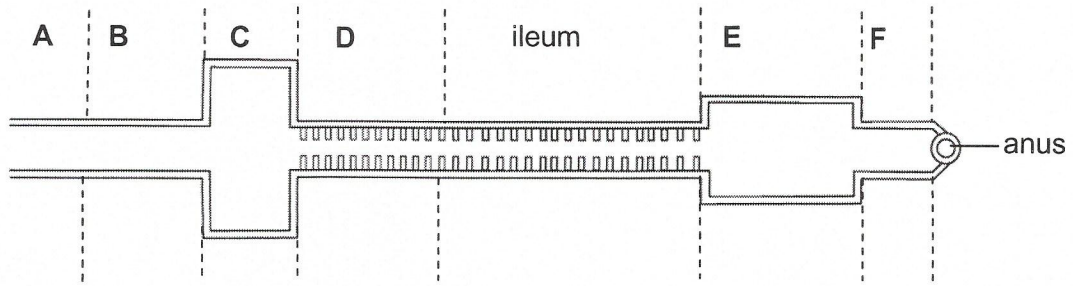


Fig. 2.1

(a) (i) Identify regions B and C.

B

C [2]

(ii) State the functions of regions A and F.

A

.....

F.....

..... [2]

(b) Mineral salts and glucose are absorbed at region D and the ileum.

(i) Describe the absorption of mineral salts after taking a meal containing a lot of mineral salts.

.....

.....

.....

..... [3]

(ii) Describe the absorption of glucose when its concentration is higher in the blood than in the ileum.

.....

.....

.....

..... [3]



(c) State **two** ways in which the ileum is adapted to help absorption of food to take place rapidly.

1.

.....

2.

..... [2]

(d) Suggest a problem likely to be experienced by someone whose digestive system fails to absorb water from indigestible food remains.

.....

..... [1]

[Total: 13]

3 Fig.3.1 shows the stages 1 to 4 of how xylem vessels form.

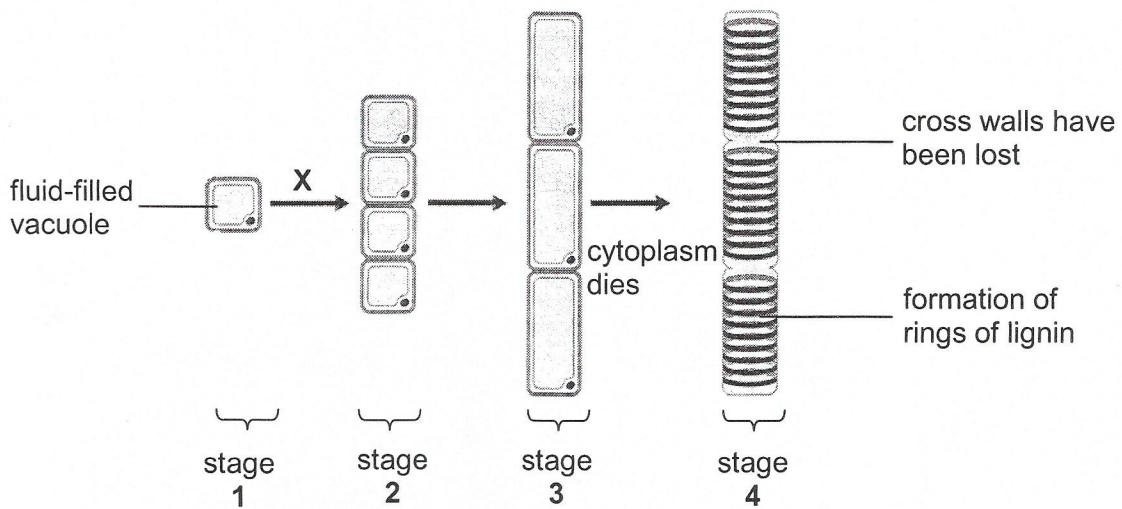


Fig. 3.1

(a) (i) Name the type of cell division taking place at X.

..... [1]

(ii) Identify the level of cell organisation at stages 1 and 3 using the following list of terms.

organelle system tissue cell organ

stage 1

stage 3 [2]

(b) Suggest the importance of the changes described at stage 4 in the formation of xylem vessels.

(i) formation of rings of lignin

.....
 [1]

(ii) death of cytoplasm

.....
 [1]

(iii) loss of cross walls

.....
 [1]

[Total: 6]



- 4 Fig. 4.1 shows the results of an experiment investigating the effects of growing plants in different solutions of mineral salts. All other conditions were similar.

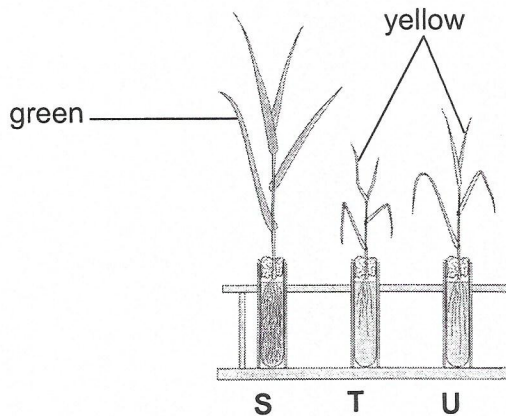


Fig. 4.1

Table 4.1 shows the composition of the different solutions the plants **S**, **T** and **U** were growing in, but not necessarily in that order.

Table 4.1

solution	mineral ions supplied				
	calcium	iron	magnesium	sulphate	nitrate
1	✓	✓	✓	✓	x
2	✓	✓	x	✓	✓
3	✓	✓	✓	✓	✓

Key:

✓ = present

X = absent

- (a) Complete Table 4.2 by matching plants **S** and **U** to the solution each was grown in. Plant **T** has been matched to the solution it was grown in.

Table 4.2

solution	plant
1	T
2	
3	

[1]

(b) Explain the appearance of plant T in Fig. 4.1.

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

(c) Some soils lack nitrates.
Describe how a farmer can restore nitrates in such soils without applying fertilizers.

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

[Total: 6]



- 5 A man was born with non-elastic eye lenses which made it difficult for him to see objects clearly. The man looked at an object 50 cm away but could not see it clearly. He then moved towards the object until it was 20 cm away from him but still, he could not see the object.

Fig. 5.1 and Fig. 5.2 show the man's eye attempting to focus on objects at different positions.

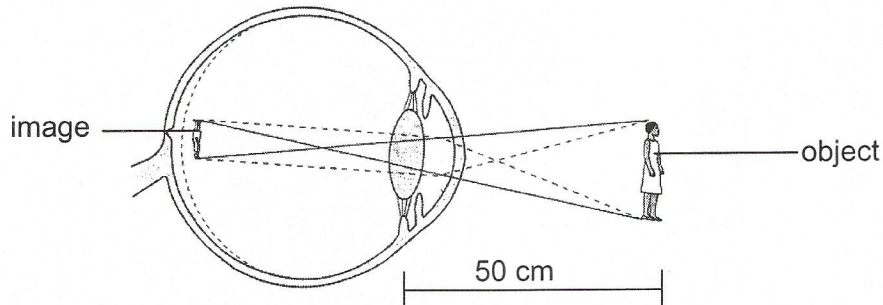


Fig. 5.1

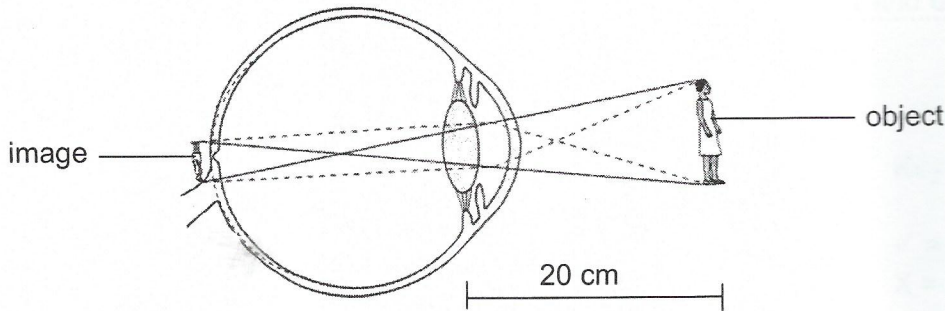


Fig. 5.2

- (a) With reference to Fig. 5.1, state the reason why the man could not see the object clearly from a distance of 50 cm.

..... [1]

- (b) With reference to the object in Fig. 5.2, suggest the direction and the distance the man should move in order to see the object clearly.

direction:

distance:..... [2]

- (c) Describe and explain the changes that would take place in a normal eye when a person moves from the distance of 50 cm to that of 20 cm in relation to an object.

.....

 [3]

[Total: 6]

Section B

Answer **both** questions.

Write your answers on the separate answer paper provided.

- 6 (a) Discuss conservation of plants and animals in Botswana by,
- (i) describing how it is carried out, and [5]
- (ii) stating reasons for conserving them. [6]
- (b) (i) Outline the importance of recycling sewage water. [2]
- (ii) State **two** uses of recycled water. [2]

[Total: 15]

- 7 Fig. 7.1 shows part of the human gaseous exchange system.

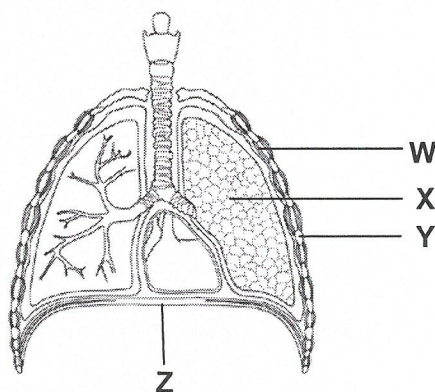


Fig. 7.1

A student accidentally fell into a swimming pool and water rushed into her lungs as she breathed in.

- (a) (i) Identify structures **W**, **X**, **Y** and **Z** and describe the role played by each in moving the water into the lungs of the student. [9]
- (ii) The student could die if the water is not quickly removed from her lungs. Suggest how the water might lead to the student's death. Explain your answer. [4]
- (b) Suggest **two** ways of maintaining a healthy gaseous exchange system. [2]

[Total: 15]

