Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

0921905600

BIOLOGY **5090/21**

Paper 2 Theory **October/November 2018**

1 hour 45 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Section A
Answer **all** questions in this section.
Write your answers in the spaces provided on the Question Paper.

Section B
Answer **both** questions in this section.
Write your answers in the spaces provided on the Question Paper.

Section C
Answer **either** question 8 **or** question 9.
Write your answers in the spaces provided on the Question Paper.

You are advised to spend no longer than one hour on Section A.
Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

DC (NF/SW) 145249/3
© UCLES 2018

Section A

Answer **all** questions in this section.

Write your answers in the spaces provided.

1 The diagram shows the parts of a plant growing above ground.



(a) (i) State the type of reproduction that takes place using the flower shown in the diagram.

..... [1]

(ii) Describe the events that must take place for the flower to develop into a fruit.

.....

.....

.....

.....

.....

.....

..... [5]

(b) The plant may also reproduce without using a flower, to produce new plants from plantlets.

State the type of reproduction that produces the plantlets.

..... [1]

© UCLES 2018

(c) Suggest the advantages to the plant of reproducing by each of the following methods:

using flowers, ...

.....

.....

using plantlets. .....

.....

.....

[3]

[Total: 10]

BLANK PAGE

© UCLES 2018

2 The diagram shows a seed (Fig. 1) and a plant developing from this seed (Fig. 2).

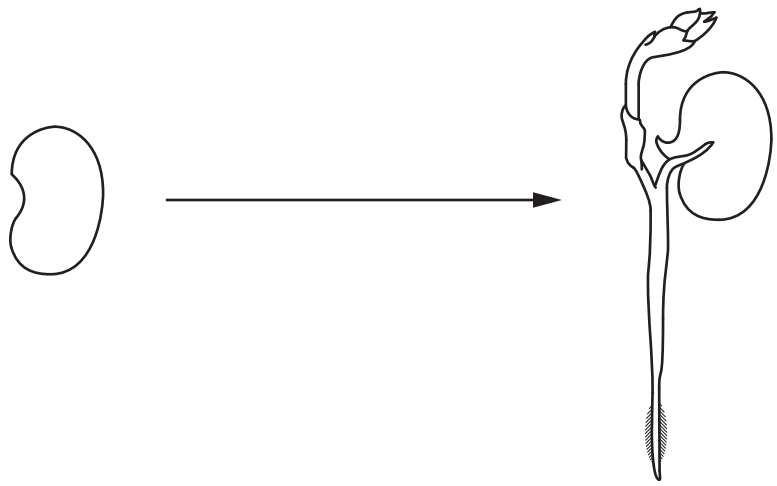


Fig. 1 **Fig. 2**

(a) (i) Name **two** structures visible in Fig. 2 that are **not** visible in Fig. 1.

1 .....

2 ..... [2]

(ii) Name the process represented by the arrow drawn between Fig. 1 and Fig. 2. Describe the use of enzymes in this process.

name of process .....

use of enzymes .....

.....

.....

.....

[4]

(b) In an experiment, the growth of a plant from a seed is found to be faster as temperatures increase up to 35 °C.

Explain how the development of a plant from a seed would be affected by a temperature much higher than 35 °C.

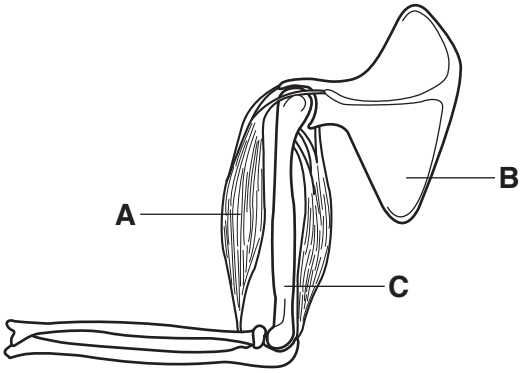
.....

.....

..... [2]

[Total: 8]

3 The diagram shows the arrangement of bones and muscles in the arm.



(a) **(i)** Name each of the following:

A .....

B .....

C ..... [3]

(ii) Identify the hinge joint on the diagram, by using a label line and the letter **H**. [1]

(iii) Describe how the type of movement of a ball and socket joint differs from that of a hinge joint.

.....

..... [1]

(b) The contraction of muscle **A** to raise the lower part of the arm requires energy. This energy may be provided by aerobic respiration.

(i) State the equation, in words or symbols, for aerobic respiration.

..... [2]

(ii) Explain why a person may feel pain in muscle **A** if the arm is raised and lowered a number of times quickly.

.....

.....

..... [2]

© UCLES 2018

(iii) Suggest and explain what would happen to the time taken for the person to feel pain in muscle **A** if the arm was raised and lowered while holding a heavy object in the hand.

.....

.....

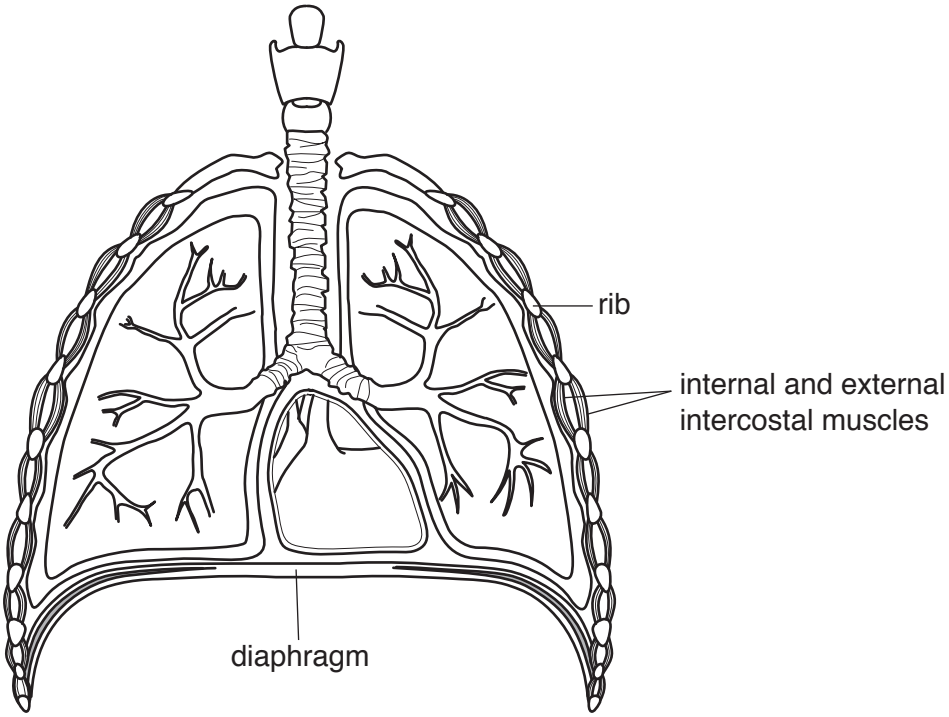
.....

.....

..... [3]

[Total: 12]

4 The diagram shows the human thorax.



(a) (i) Describe how each of the structures named in the diagram is involved when a person takes a single breath **in**.

.....

.....

.....

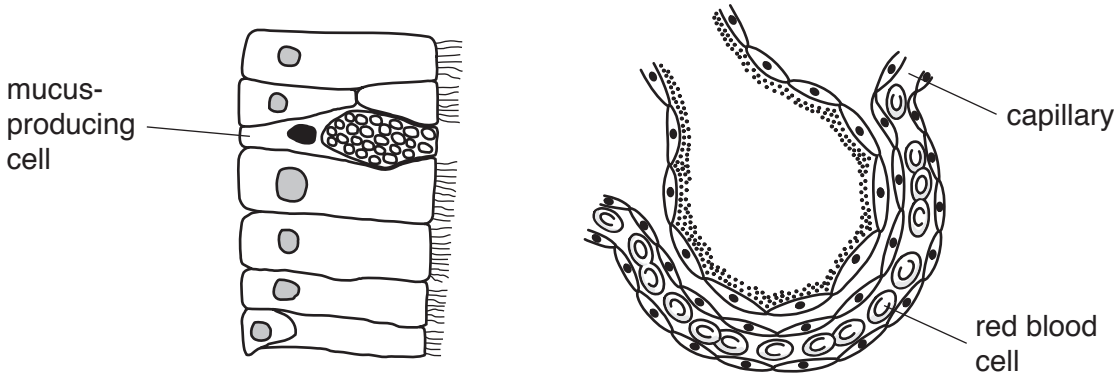
.....

.....

..... [3]

© UCLES 2018

(ii) The diagrams below show two magnified structures, **D** and **E**, from the thorax.



structure D **structure E**

Draw lines labelled **D** and **E** on the diagram of the thorax on page 8 to indicate the positions of **structure D** and **structure E**. [2]

(b) Describe how structure is related to function for each of the following:

a capillary, ...

.....

.....

a red blood cell. .....

.....

..... [5]

[Total: 10]

5 Fig. 1 shows cells from a plant tissue which have been mounted on a slide with distilled water and viewed using a microscope.

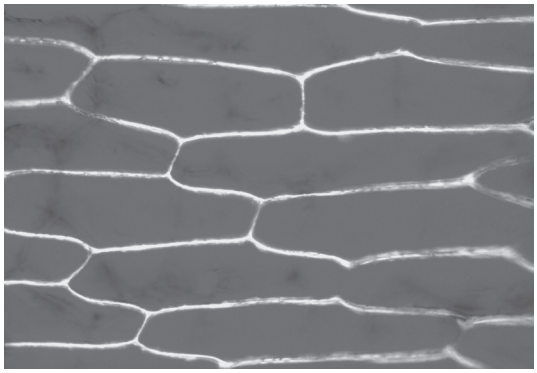


Fig. 1

Fig. 2 shows cells taken from the same plant tissue when mounted on a slide with concentrated salt solution.

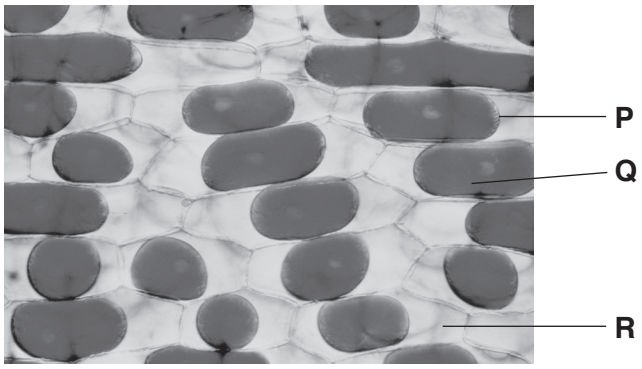


Fig. 2

(a) Explain the appearance of the cells in Fig. 2.

.....

.....

.....

.....

.....

..... [4]

(b) **(i)** Identify structures **P** and **Q** in Fig. 2.

P .....

Q ..... [2]

(ii) State the contents of location **R** in Fig. 2.

..... [1]

(iii) The concentrations of substances in structure **Q** are different from those in location **R**.

Explain how the properties of structure **P** result in differences in concentrations of substances in **Q** and **R**.

.....

.....

.....

.....

..... [3]

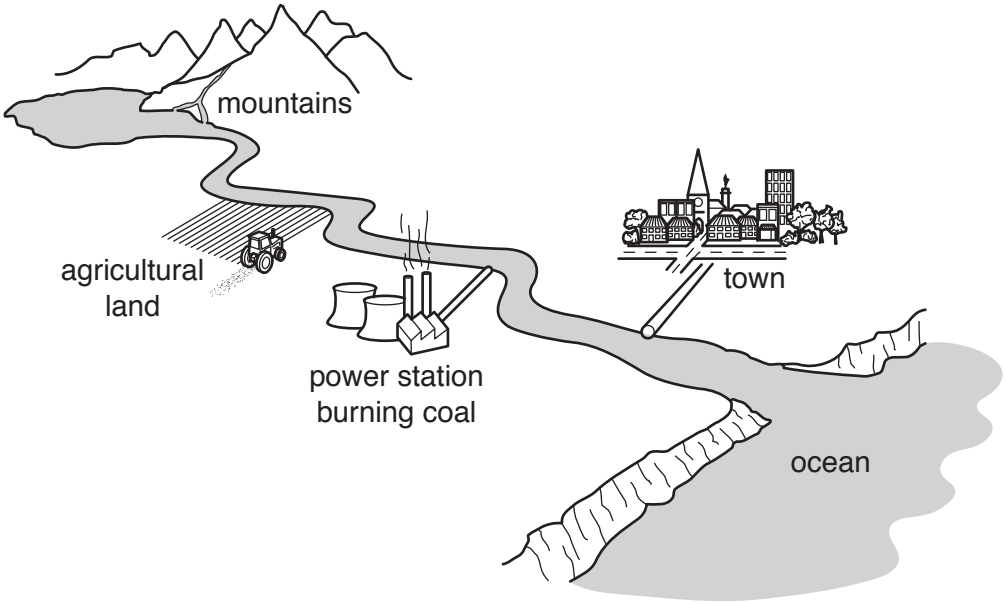
[Total: 10]

Section B

Answer **both** questions in this section.

Write your answers in the spaces provided.

6 The diagram shows the location of several features close to a river that runs from mountains into the ocean.



(a) Describe and explain the possible harmful effects of human activity on the environment at each of the following locations:

the agricultural land, ...

.....

.....

.....

.....

the power station. .....

.....

.....

.....

..... [6]

(b) Suggest ways in which people in the town could make changes to their activities in order to reduce the harmful impact that they have on the environment.

.....

.....

.....

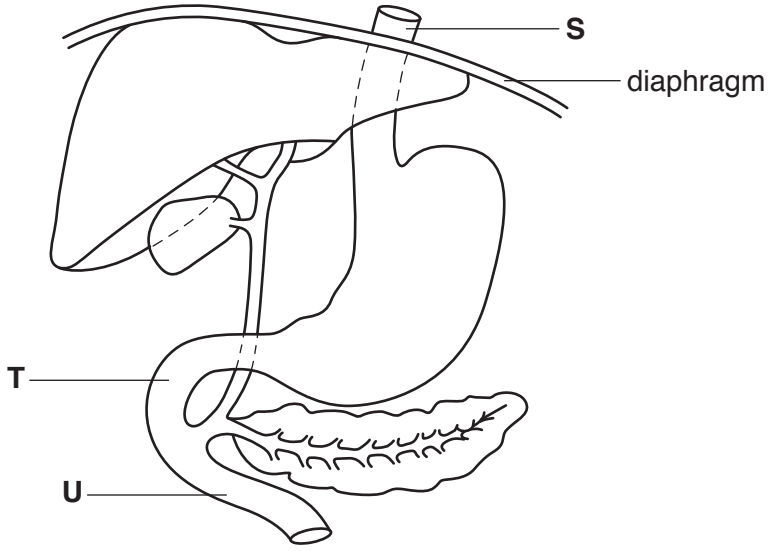
.....

.....

..... [4]

[Total: 10]

7 The diagram shows a region of the alimentary canal and the associated organs.



(a) (i) Identify part **S**.

..... [1]

(ii) Name and describe the process which moves food through part **S**.

.....

.....

.....

.....

.....

..... [4]

(b) (i) Draw a (ring) around the correct words to complete the sentence below.

higher than **the same as** **lower than**

The pH at location **U** is ..... that at location **T**. [1]

(ii) Explain how the pH at location **U** results from secretions produced by organs shown in the diagram. Name these organs.

.....

.....

.....

.....

.....

..... [4]

[Total: 10]

Section C

Answer **either** question 8 **or** question 9.

Write your answers in the spaces provided.

8 **(a)** Describe and explain how each of the following affects enzyme activity:

pH, ...

.....

.....

.....

.....

.....

.....

.....

temperature. .....

.....

.....

.....

.....

.....

.....

..... [7]

(b) Name **one** enzyme that acts in a **named** part of the alimentary canal and describe the role of this enzyme in digestion.

.....

.....

.....

.....

..... [3]

[Total: 10]

© UCLES 2018

9 **(a)** Describe and explain how each of the following affects the rate of photosynthesis:

light intensity, ...

.....

.....

.....

.....

.....

.....

.....

temperature. .....

.....

.....

.....

.....

.....

.....

..... [7]

(b) Explain how animals are dependent on the process of photosynthesis.

.....

.....

.....

.....

..... [3]

[Total: 10]

© UCLES 2018

BLANK PAGE

© UCLES 2018

BLANK PAGE

© UCLES 2018

BLANK PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cie.org.uk after the live examination series.

Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.

© UCLES 2018