UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

BIOLOGY **5090/22**

Paper 2 Theory **October/November 2013**

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 a pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
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 **all** questions.
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.
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.

Electronic calculators may be used.

DC (NH/JG) 62458/3

UNIVERSITY of CAMBRIDGE International Examinations

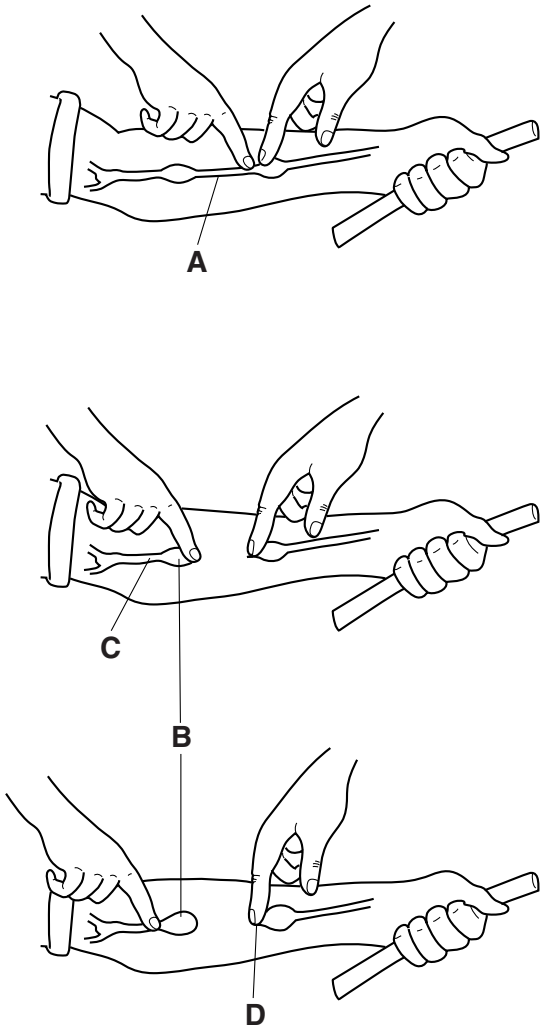
Section A

Answer **all** the questions in this section.

Write your answers in the spaces provided.

For Examiner's Use

1 Fig. 1.1 shows a demonstration related to blood circulation.



Both fingers are pressed firmly on blood vessel **A**.

Both fingers remain pressing on the blood vessel. The finger on the left is then drawn along the blood vessel and stops when it reaches **B**. It is then removed and replaced at **C**.

The finger on the right continues to press firmly on the blood vessel. The finger on the left is then pushed gently but firmly towards **B** which increases in size.

Fig. 1.1

(a) (i) Name the type of blood vessel labelled **A** in Fig. 1.1.

..... [1]

(ii) Name the structure leading to the effect shown in this blood vessel at position **B**.

..... [1]

(b) In the space below, draw a longitudinal section (cut along its length) through the blood vessel as it appears at position **B**.

For Examiner's Use

[2]

(c) Suggest why, at the end of the demonstration, the blood vessel is no longer visible between positions **B** and **D**.

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.....[4]

(d) Suggest why a rod was repeatedly gripped tightly before carrying out this demonstration.

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.....[2]

[Total: 10]

[Turn over

2 Fig. 2.1 shows how an alcoholic drink is produced in some countries.

For Examiner's Use

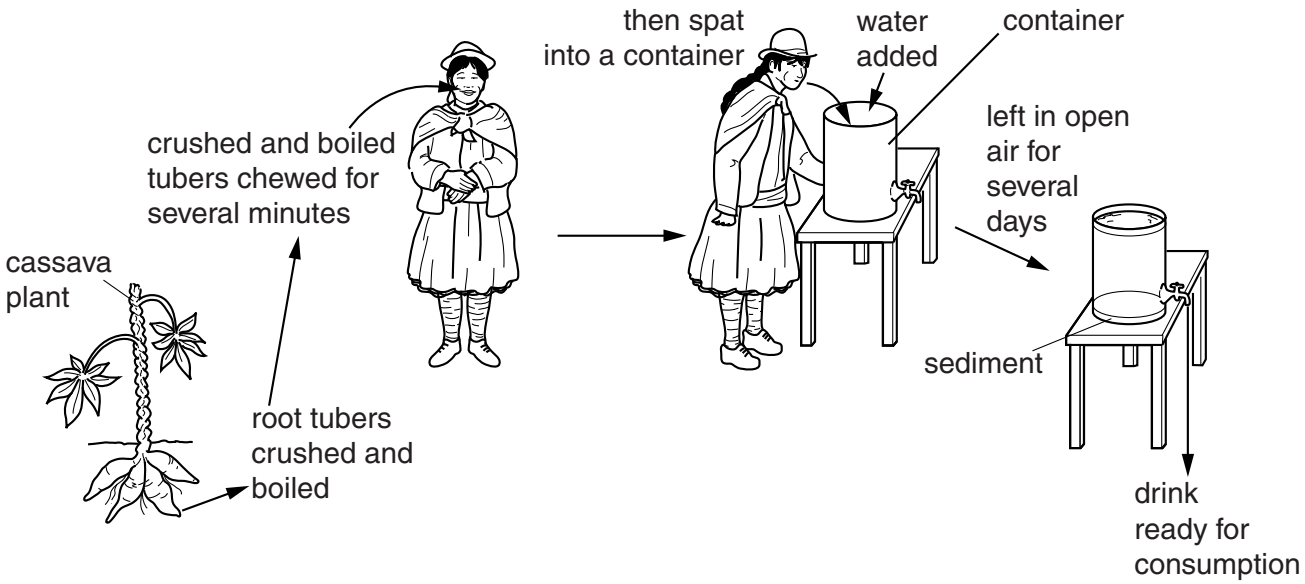

Fig. 2.1

(a) The root tubers of the cassava plant store starch. After removal from the plant, the tubers are crushed and boiled.

Suggest the effect that crushing and boiling will have on the cells of the tubers.

.....

.....[2]

(b) After they have been crushed and boiled, the cassava tubers are chewed for several minutes.

Explain what happens to the starch during this time.

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.....[3]

For Examiner's Use

(c) **(i)** Name the process that must occur in the container to produce alcohol and, in the space below, give an equation for this process.

process.....

equation

[3]

(ii) Name the type of organism, whose spores are found in soil and floating in the air, that will bring about the production of alcohol.

.....[1]

(d) Suggest why the sediment in the bottom of the container increases in quantity as the container is left to stand for several days.

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.....[2]

[Total: 11]

[Turn over

3 Fig. 3.1 shows six different animal and plant cells.

For Examiner's Use

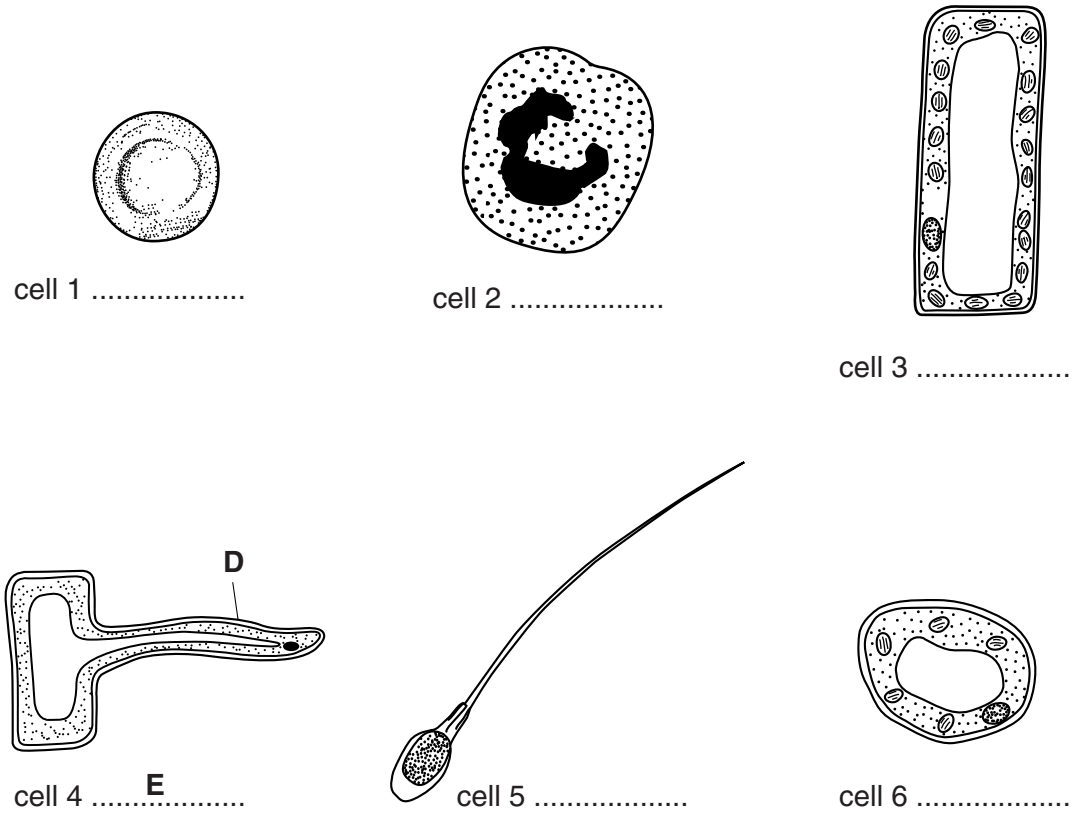

Fig. 3.1

(a) (i) Name cells 4 and 5. Write your answers below.

cell 4 .....

cell 5 ..... [2]

(ii) Describe the function of structure **D** in cell 4.

.....

..... [3]

(b) You are now required to identify each cell **by letter**, following a series of instructions.

For Examiner's Use

When you have identified each cell, write the appropriate letter beneath the identified cell in Fig. 3.1, in the space provided.

Cell **E** has already been identified for you.

Select a cell in Fig. 3.1, then ask yourself the following questions.

Q1 Does the cell have a cell wall?
if it does, go to Q2
if it does not, go to Q3

Q2 Does the cell have chloroplasts?
if it does, go to Q4
if it does not, then it is cell **E**

Q3 Does the cell have a nucleus?
if it does, go to Q5
if it does not, then it is cell **F**

Q4 Does the cell show more than 5 chloroplasts?
if it does, it is cell **G**
if it does not, then it is cell **H**

Q5 Does the nucleus occupy more than half of the cell's cytoplasm?
if it does, it is cell **J**
if it does not, then it is cell **K**

When you have completed this process for the cell you selected, repeat the process for another cell, and continue until all cells have been identified by letter. [5]

[Total: 10]

[Turn over

4 Fig. 4.1 shows a large jar in which plants are growing.

For Examiner's Use

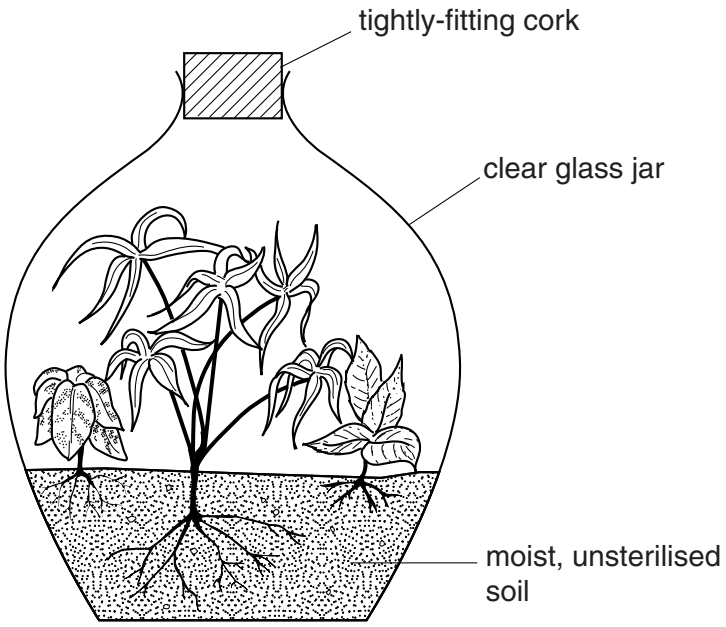

Fig. 4.1

This jar provides an environment in which plants can live for many months without adding water or removing the tightly-fitting cork to allow air to enter.

(a) State the reason for placing the jar where it can receive a supply of sunlight.

.....[1]

(b) Suggest why the plants in the jar show only very limited growth compared with similar plants growing under natural conditions.

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.....[3]

(c) The cork prevents atmospheric air from entering the jar. Explain how the plants are able to remain alive without a continuous supply of fresh air.

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.....[4]

(d) Explain why no water needs to be added to the jar.

For Examiner's Use

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.....[3]

[Total: 11]

5 Fig. 5.1(a) shows several members of the same species of small mammal. Some of these have white fur and some have black fur. They live in a region with very light-coloured soil.

Fig. 5.1(b) shows the effect of predation by a hawk (a carnivorous bird) after several years.

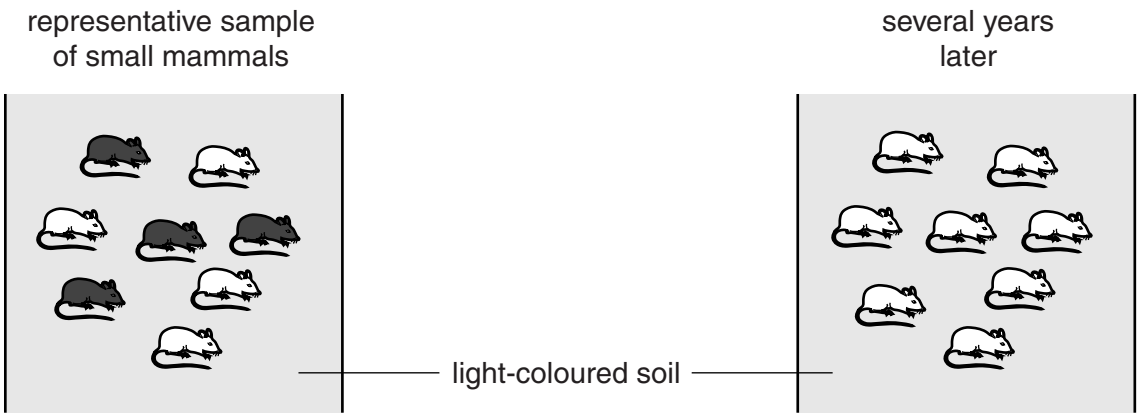

Fig. 5.1(a) **Fig. 5.1(b)**

(a) State the term for groups of animals and plants of different species linked together in a feeding relationship in the same environment.

.....[1]

(b) Explain what has happened to the small mammal population in the time between Fig. 5.1(a) and Fig. 5.1(b).

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.....[3]

(c) A change in agricultural practice caused the soil to become slightly darker.

(i) Suggest **two** genetic changes that might occur in this population of small mammals.

1 .....

2 .....[2]

(ii) Explain how these genetic changes might help these small mammals to survive such an environmental change.

.....

.....[2]

[Total: 8]

Section B

For Examiner's Use

Answer **all** the questions in this section.

Write your answers in the spaces provided.

6 **(a)** State the similarities between sweating and transpiration.

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.....[3]

(b) Describe the differences between sweating and transpiration.

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.....[7]

[Total: 10]

[Turn over

7 **(a)** Explain why the lungs are considered to be organs of excretion.

For Examiner's Use

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.....[3]

(b) Describe how the kidneys maintain blood at a constant concentration.

Explain the importance of this function.

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.....[7]

[Total: 10]

Section C

For Examiner's Use

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

Write your answers in the spaces provided.

8 **(a)** Describe the part played by an ovule in the reproduction of a plant.

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.....[4]

(b) State the products of an ovary in a woman and describe the roles of each of these products.

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.....[6]

[Total: 10]

For Examiner's Use

9 **(a)** Describe the methods by which the spread of human immunodeficiency virus (HIV) may be controlled.

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.....[4]

(b) Describe the control of malaria in terms of the measures taken against its vector. Explain the effect of each measure on the vector.

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.....[6]

[Total: 10]

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