UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

1336066182

BIOLOGY **5090/22**

Paper 2 Theory **October/November 2012**

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.

For Examiner's Use	
Section A	
Section B	
Section C	
Total	

This document consists of **15** printed pages and **1** blank page.

Section A

For Examiner's Use

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

Write your answers in the spaces provided.

1 Fig. 1.1(a) shows a section through a person's head and throat. Fig. 1.1(b) shows the same person swallowing a bolus of food.

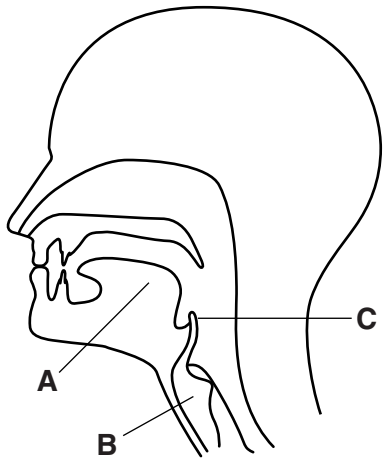

Fig. 1.1(a)

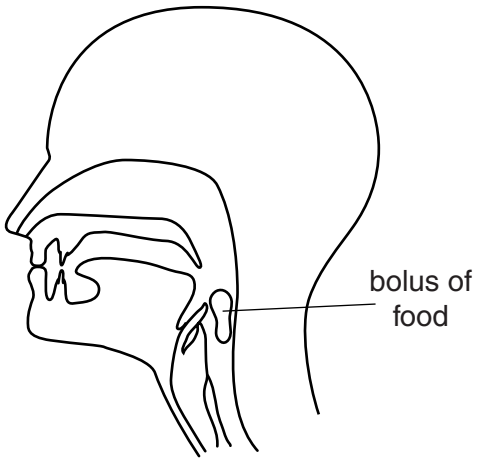

Fig. 1.1(b)

(a) Identify structures **A** and **B** shown on Fig. 1.1(a).

A .....

B ..... [2]

(b) Name the process that will carry the bolus to the stomach.

..... [1]

(c) Describe and explain what happens to structure **C** when the person swallows the bolus.

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.....[3]

(d) (i) Name a chemical process that may be taking place in the bolus.

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For Examiner's Use

(ii) Describe and explain your answer to **(d)(i)**.

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.....[4]

[Total: 10]

2 Species **D** lives in a forest. Fig. 2.1 shows what can happen, over the same period of time, if some members of species **D** migrate from the forest to a desert region.

For Examiner's Use

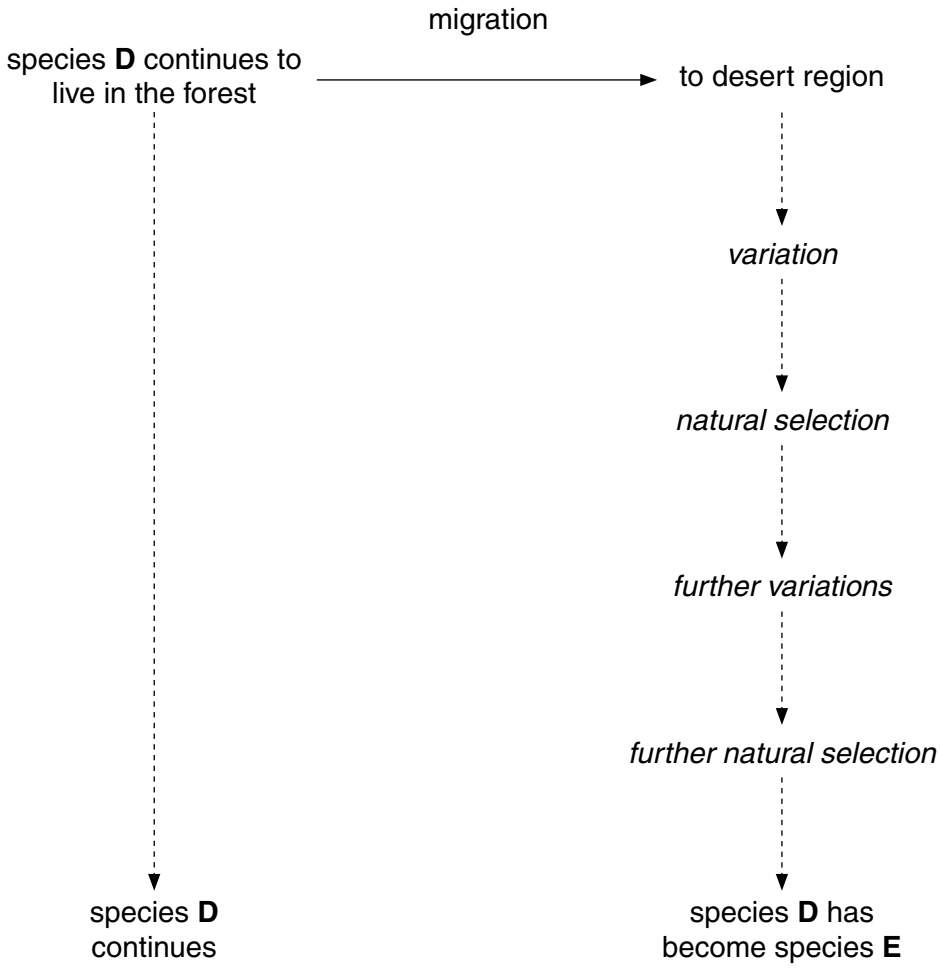

Fig. 2.1

(a) Name the **two** main causes of variation in organisms.

1. .....

2. ..... [2]

(b) Name the process involving variation and natural selection that has led to the development of species **E**.

..... [1]

(c) Suggest how the processes of variation and natural selection may have acted to produce the new species **E** in the desert.

For Examiner's Use

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.....[4]

(d) Members of species **D** are no longer able to breed successfully with members of new species **E**. Suggest reasons for this.

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.....[2]

[Total: 9]

3 Fig. 3.1 shows a plant and the position in which it grows in the dead leaves that collect where two branches of a tree join.

For Examiner's Use

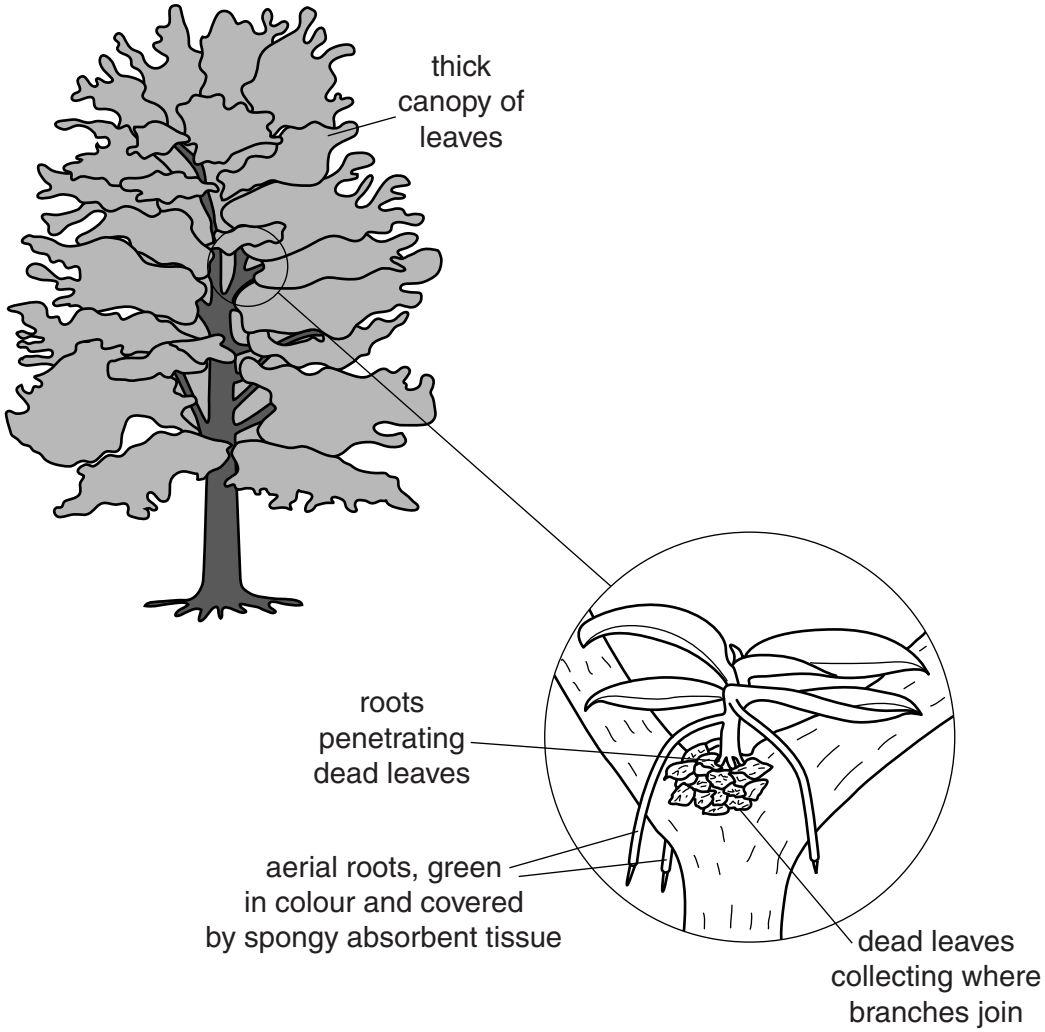

Fig. 3.1

(a) State **two** ions that the roots of the plant will absorb from the dead leaves. For each ion, state its importance to the plant.

ion 1 .....

importance .....

ion 2 .....

importance .....[4]

(b) Explain how the ions you have mentioned in **(a)** are made available to the plant from the dead leaves.

For Examiner's Use

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.....[4]

(c) Suggest and explain why the aerial roots of the plant are green and covered with a spongy absorbent tissue.

green

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covered with a spongy absorbent tissue

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.....[3]

[Total: 11]

4 Fig. 4.1 shows a person sitting on a chair with his legs crossed, watching the television. A friend notices that the person's foot is making very slight regular kicking movements as indicated by the arrow on Fig. 4.1.

For Examiner's Use

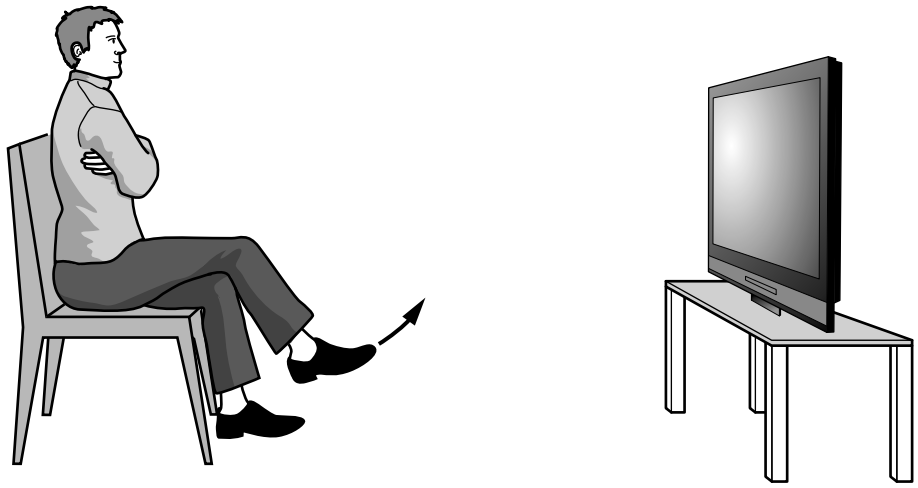

Fig. 4.1

The friend times the movements with her watch and announces that the person's heart is beating 70 times per minute.

(a) (i) Explain how the friend was able to make this deduction.

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.....[4]

(ii) Explain why the person's leg kicks at a faster rate when there is an exciting programme on the television.

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.....[1]

Fig. 4.2(a) shows a chair leaning against a wall, carefully balanced and with a scale pan hanging from the front of the seat. Fig. 4.2(b) shows what happens when a mass is then added to the scale.

For Examiner's Use

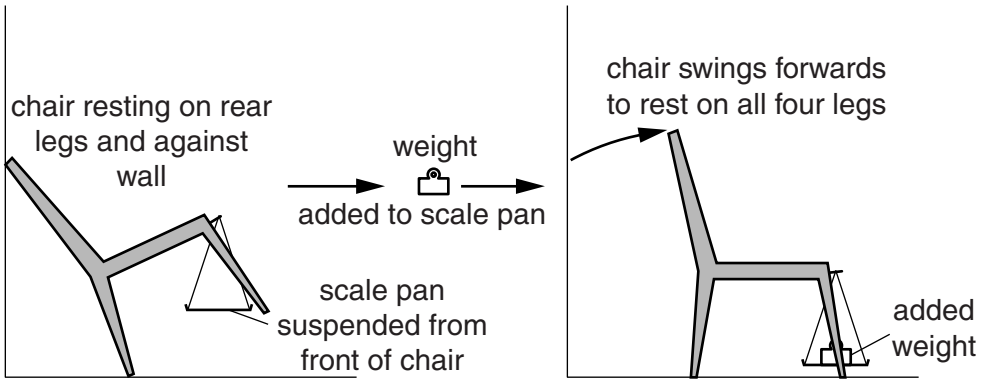

Fig. 4.2(a) **Fig. 4.2(b)**

A student sits in a chair, leaning against a wall as shown in Fig. 4.2(a), and **remains perfectly still**.

(b) Use your knowledge of how blood moves through the circulatory system to suggest an explanation for why, after a few minutes, the chair falls forwards similar to the chair in Fig. 4.2(b).

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[Total: 9]

5 The graph in Fig. 5.1 shows the concentration of nicotine in the blood of a person before, during and after smoking a cigarette.

For Examiner's Use

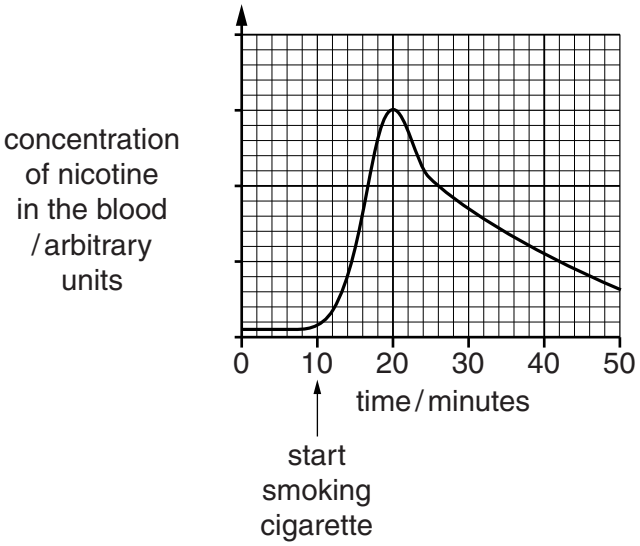

Fig. 5.1

(a) Use Fig. 5.1 to find the time taken for the person to smoke the cigarette.

..... [1]

(b) Suggest why the concentration of nicotine in the person's blood was not zero before starting to smoke the cigarette.

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.....[1]

(c) Name two components of the cigarette smoke, other than nicotine, that may be harmful to the person. For each component, state the harm that it may cause.

component 1 .....

harm it may cause .....

.....

component 2 .....

harm it may cause .....

.....[4]

(d) Fig. 5.2 shows the blood pressure of the same person over the same time period.

For Examiner's Use

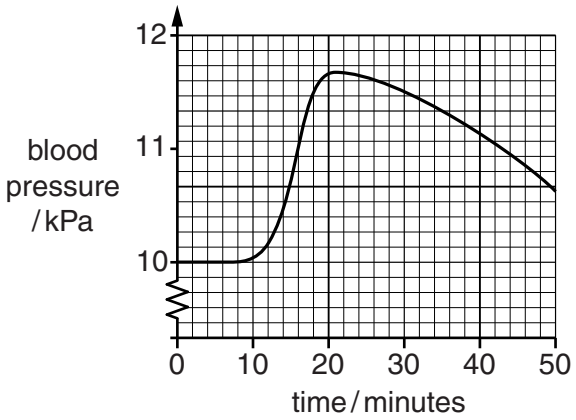

Fig. 5.2

(i) Use Fig. 5.2 to describe the effects of smoking the cigarette on this person's blood pressure.

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.....[2]

(ii) Suggest how smoking a cigarette resulted in this effect on blood pressure.

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.....[1]

(iii) Suggest possible harmful effects of this change in blood pressure.

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.....[2]

[Total: 11]

Section B

For Examiner's Use

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

Write your answers in the spaces provided.

6 Fig. 6.1 and Fig. 6.2 show two tissues found in plants.

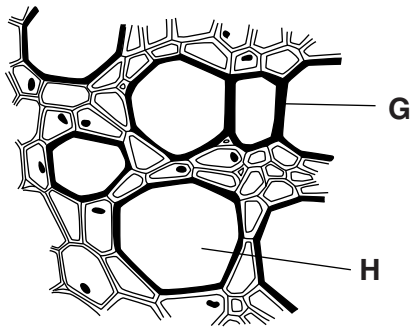

Fig. 6.1

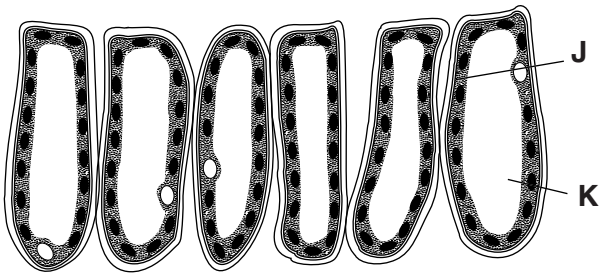

Fig. 6.2

Identify the tissues and describe their functions. Your descriptions should make appropriate reference to the importance of **G**, **H**, **J** and **K**.

name of tissue in Fig. 6.1 .....

description .....

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name of tissue in Fig. 6.2 .....

description .....

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[Total: 10]

7 **(a)** Define the term, *excretion*.

For Examiner's Use

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(b) Describe how a kidney machine carries out the functions of a kidney for a person suffering from kidney disease.

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[Total: 10]

Section C

For Examiner's Use

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

Write your answer in the spaces provided.

8 **(a)** Explain what is meant by the *lock and key* hypothesis for enzyme action.

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(b) Describe how enzyme action is affected by an increase in temperature.

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[Total: 10]

For Examiner's Use

9 **(a)** Explain what is shown by a pyramid of biomass.

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(b) Explain how, for the same organisms, a pyramid of numbers can differ from a pyramid of biomass.

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[Total: 10]

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