UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

1822079366

BIOLOGY **0610/21**

Paper 2 Core **May/June 2011**

1 hour 15 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 or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
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	
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total	

This document consists of **16** printed pages.

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1 Fig. 1.1 shows six members of the cat family, Felidae.

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A

B

C

D

E

F

Fig. 1.1

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Use the key to identify the cats, **A** to **F**, shown in Fig. 1.1.

Tick (✓) the boxes in Table 1.1 to show how you identify each cat.

Write the name of each cat in the correct box in Table 1.1.

Cat **A** has been completed for you as an example.

Key

	name of cat
1 (a) Ears pointed	go to 5
(b) Ears rounded	go to 2
2 (a) Fur with no stripes or spots	*P. leo*
(b) Fur with stripes or spots	go to 3
3 (a) Fur with stripes, but no spots	*P. tigris*
(b) Fur with spots	go to 4
4 (a) Fur with spots, but no stripes	*A. jubatus*
(b) Fur with spots and stripes	*N. nebulosa*
5 (a) Fur with spots	*L. rufus*
(b) Fur with no spots	*L. caracal*

Table 1.1

cat	1 (a)	1 (b)	2 (a)	2 (b)	3 (a)	3 (b)	4 (a)	4 (b)	5 (a)	5 (b)	name of cat
A	✓									✓	*L. caracal*
B											.....
C											.....
D											.....
E											.....
F											.....

[5]

[Total: 5]

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[Turn over

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2 **(a)** **(i)** State what is meant by the term *balanced diet*.

.....

.....

.....

.....

..... [3]

(ii) Balanced diets should include fat, fibre, mineral salts and vitamins.

Name **two** other types of nutrients that should be present in a balanced diet.

.....

..... [1]

(b) Suggest and explain the effects on a person of a diet with:

(i) too little fibre,

.....

.....

..... [2]

(ii) too much animal fat.

.....

.....

..... [2]

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(c) Calcium, a mineral salt, is needed in the diet.

Explain the role of calcium in the body and the effect of calcium deficiency.

.....

.....

.....

.....

.....

..... [3]

[Total: 11]

For Examiner's Use

For Examiner's Use

3 Fig. 3.1 shows a section through parts of the male reproductive and urinary systems.

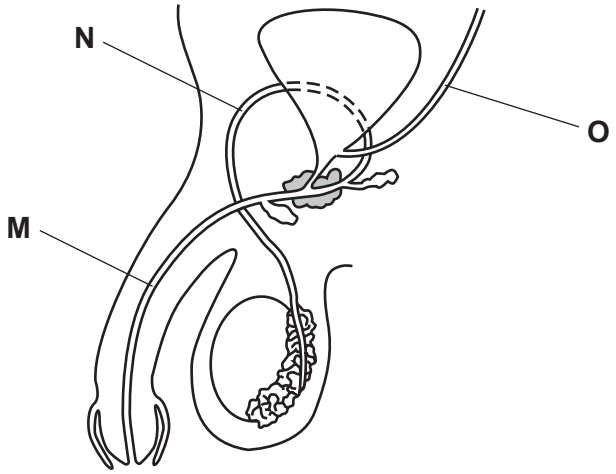

Fig. 3.1

(a) (i) Name the tubes labelled **M**, **N** and **O**.

M .....

N .....

O ..... [3]

(ii) Explain the roles of the testes, the prostate gland and the scrotum.

testes .....

.....

.....

.....

prostate gland .....

.....

.....

.....

scrotum .....

.....

.....

..... [4]

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(b) Humans use a variety of methods of birth control.

(i) On Fig. 3.1, put an **X** where a vasectomy could be carried out.

Put your answer on Fig. 3.1. [1]

(ii) Explain **one** method of birth control, used by males, that can also protect against infection by a sexually transmitted disease.

.....

.....

.....

..... [2]

(iii) Name **one** sexually transmitted disease.

..... [1]

[Total: 11]

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4 **(a)** Fig. 4.1 shows the structures involved in a reflex arc.

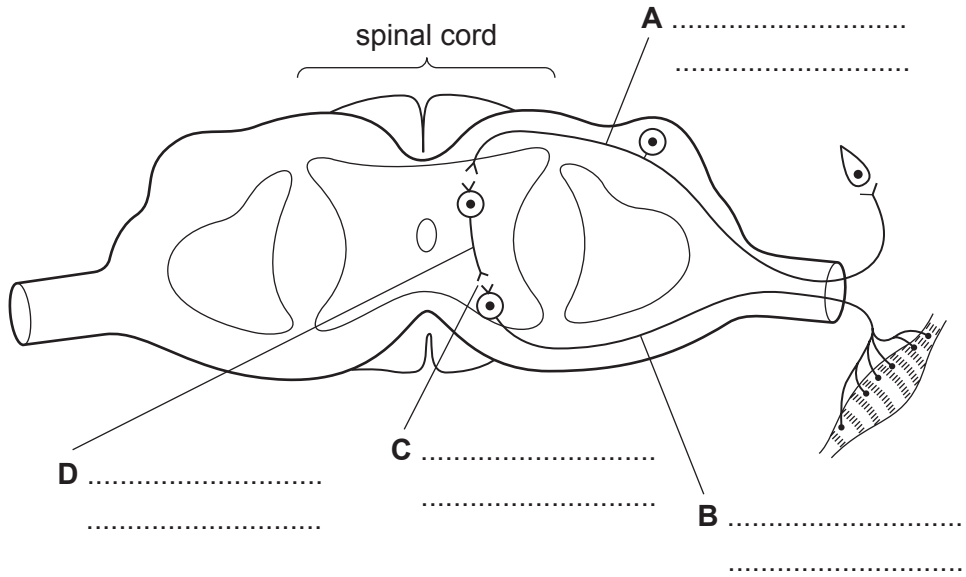

Fig. 4.1

(i) On Fig. 4.1 label structures **A**, **B**, **C** and **D**.

Write your answers on Fig. 4.1. [4]

(ii) Name the **two** types of tissue in the body that can act as effectors.

1. .....

2. ..... [2]

(b) **(i)** Describe the characteristics of a reflex action resulting from the activity of structures **A**, **B**, **C** and **D**.

.....

.....

.....

..... [2]

(ii) State **one** example of a reflex action.

.....

..... [1]

[Total: 9]

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5 **(a)** The nuclei of cells divide by two different processes, mitosis and meiosis.

(i) Name **one** organ in humans where meiosis takes place.

..... [1]

(ii) Name **one** organ in a flower where meiosis takes place.

..... [1]

(iii) Complete Table 5.1 to show **three** differences between mitosis and meiosis.

Table 5.1

	differences	
	mitosis	meiosis
1	....	....
2	....	....
3	....	....

[3]

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(b) During the division of a nucleus, a mutation may happen.

(i) Define the term *mutation*.

.....

.....

.....

..... [2]

(ii) State **two** environmental factors that may increase the rate at which mutations happen.

1. .....

2. ..... [2]

[Total: 9]

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6 **(a)** Fig. 6.1 shows the flow of some of the energy through a food chain in an ocean.

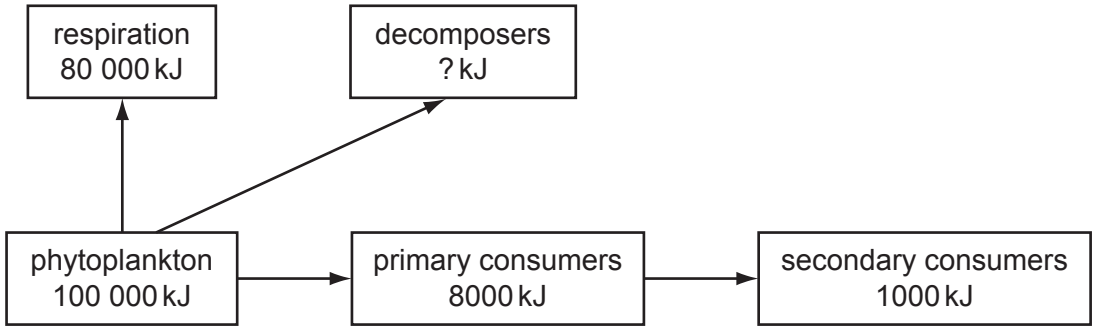

Fig. 6.1

About 1% of the light energy reaching the ocean is converted to chemical energy by the phytoplankton. The phytoplankton produce sugars, fats and proteins.

(i) Name the process that changes light energy to chemical energy.

..... [1]

(ii) Name the chemical in the phytoplankton that absorbs light energy.

..... [1]

(iii) Calculate, using information from Fig. 6.1, how much energy passes from the phytoplankton to the decomposers.

Show your working in the space below.

answer ..... kJ [1]

(iv) Name **two** groups of decomposers.

1. .....

2. ..... [2]

(v) Calculate, using information from Fig. 6.1, the percentage of energy passed from the phytoplankton to the primary consumers.

Show your working in the space below.

answer ..... % [2]

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(vi) About 88% of the energy in the primary consumers does **not** become part of the secondary consumers.

Explain how this energy is lost from the food chain.

.....

.....

.....

.....

.....

..... [3]

(b) The organisms in this food chain form a community in the ocean.

This community is formed of many populations.

Explain what is meant by the term *population*.

.....

.....

.....

..... [2]

[Total: 12]

7 Fig. 7.1 shows a carbon cycle.

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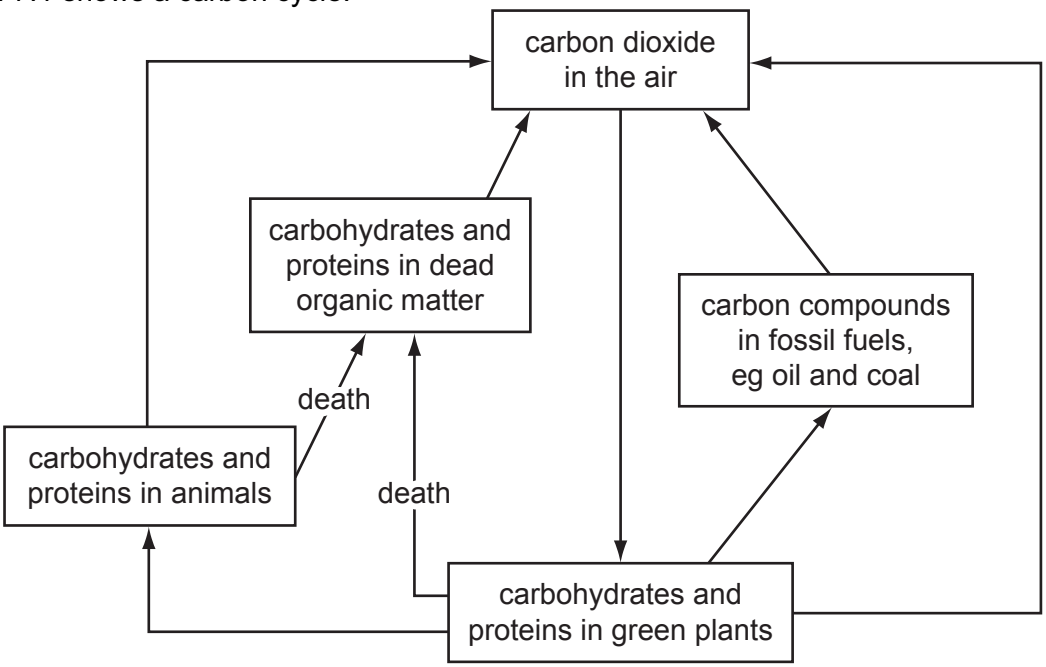

Fig. 7.1

(a) The arrows on Fig. 7.1 represent processes that occur in the cycle.

Place a letter next to an arrow that represents each of the following processes.

(i) Decomposition – **D** Put your answer on Fig. 7.1. [1]

(ii) Photosynthesis – **P** Put your answer on Fig. 7.1. [1]

(iii) Respiration – **R** Put your answer on Fig. 7.1. [1]

(b) The concentration of carbon dioxide in the air has been rising since the middle of the 19th century.

Suggest reasons why this has happened.

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 7]

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8 Fig. 8.1 shows a section through the heart.

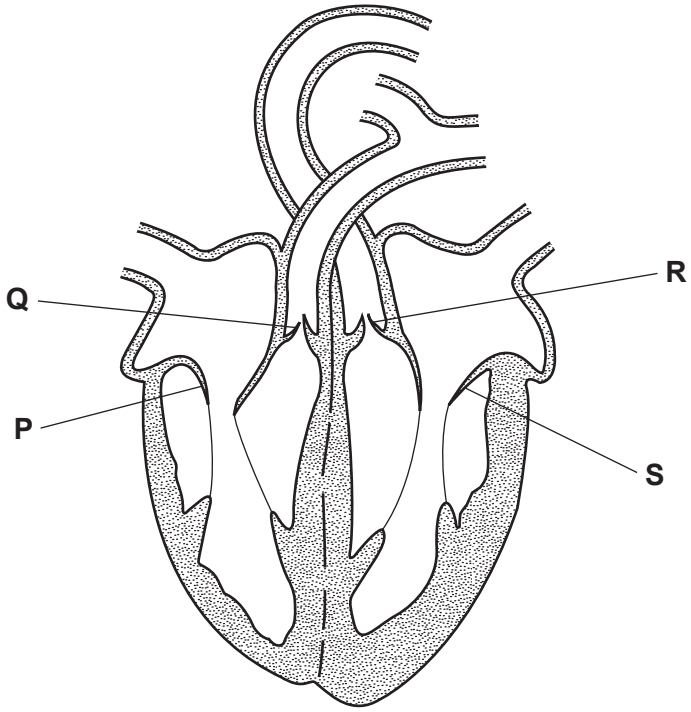

Fig. 8.1

(a) (i) Name the **two** blood vessels, shown on Fig. 8.1, that carry oxygenated blood.

.....

..... [1]

(ii) State the letter that identifies the tricuspid valve. ..... [1]

(iii) State a letter that identifies a semilunar valve. ..... [1]

(b) Describe how the heart forces blood into the aorta.

.....

.....

.....

.....

.....

..... [3]

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(c) (i) Name the blood vessel that delivers blood to the muscles of the walls of the atria and ventricles.

..... [1]

(ii) Name the **two** blood vessels that deliver blood **to** the liver.

1. .....

2. ..... [2]

[Total: 9]

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9 **(a)** Explain what is meant by the term *transpiration*.

.....

.....

.....

.....

.....

..... [3]

(b) Describe the effect that **two** named environmental factors can have on the rate of transpiration.

name of factor .....

description .....

.....

.....

name of factor .....

description .....

.....

..... [4]

[Total: 7]

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