



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE
NAME

CENTRE
NUMBER

--	--	--	--	--

CANDIDATE
NUMBER

--	--	--	--



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.

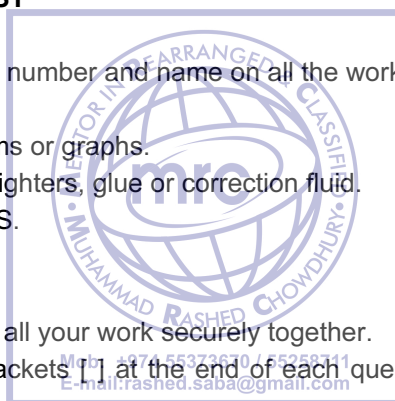
Do not use staples, paper clips, highlighters, glue or correction fluid.

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.



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

For
Examiner's
Use



A



B



C



D



E



F

Fig. 1.1

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.

For
Examiner's
Use

Key

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

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	✓									✓	<i>L. caracal</i>
B										
C										
D										
E										
F										

[5]

[Total: 5]

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]

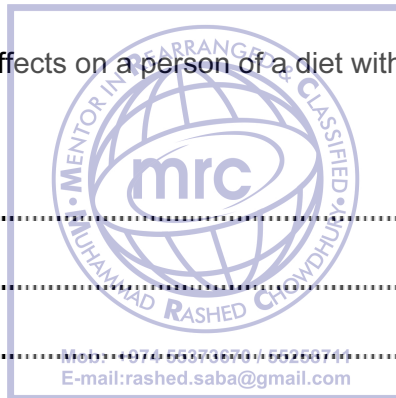
(ii) too much animal fat.

.....

.....

.....

..... [2]



For
Examiner's
Use

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

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

For
Examiner's
Use

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 11]



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

For
Examiner's
Use

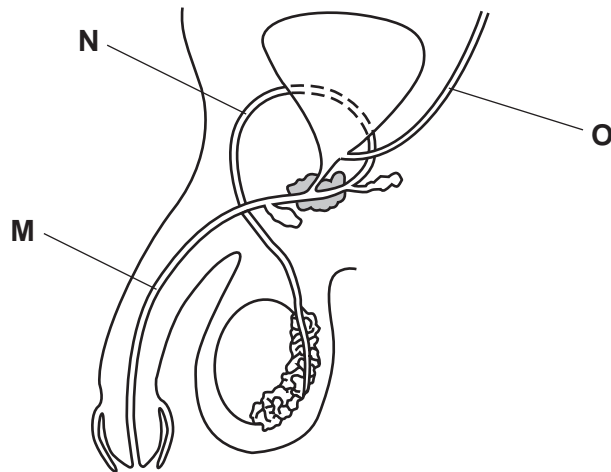


Fig. 3.1

(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

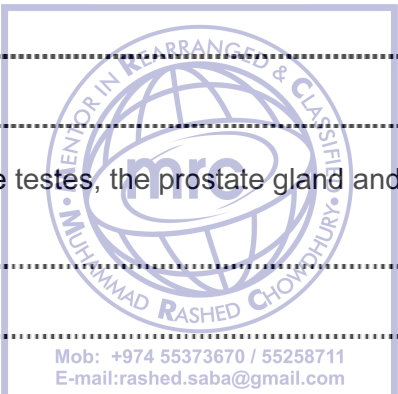
.....

.....

.....

.....

..... [4]



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

For
Examiner's
Use

(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]



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

For
Examiner's
Use

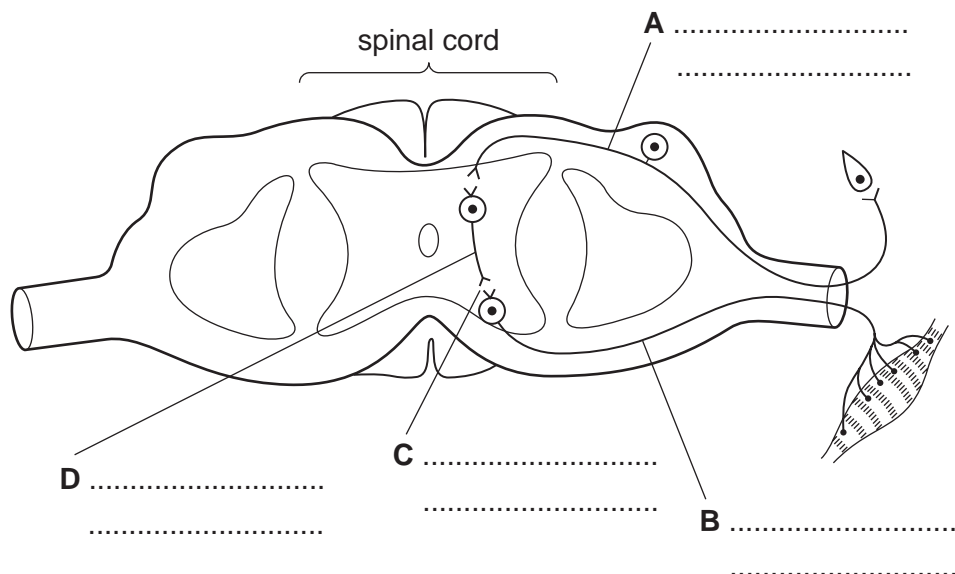


Fig. 4.1

(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]

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

For
Examiner's
Use

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

..... [1]

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

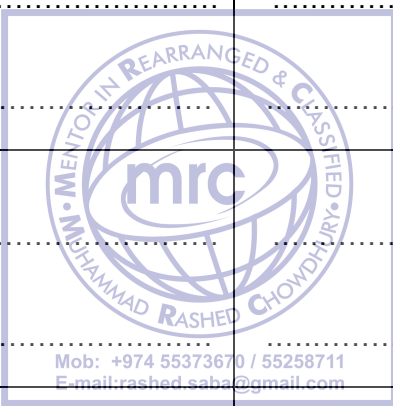
..... [1]

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

Table 5.1

	differences	
	mitosis	meiosis
1
2
3

[3]



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

For
Examiner's
Use

(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]



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

For
Examiner's
Use

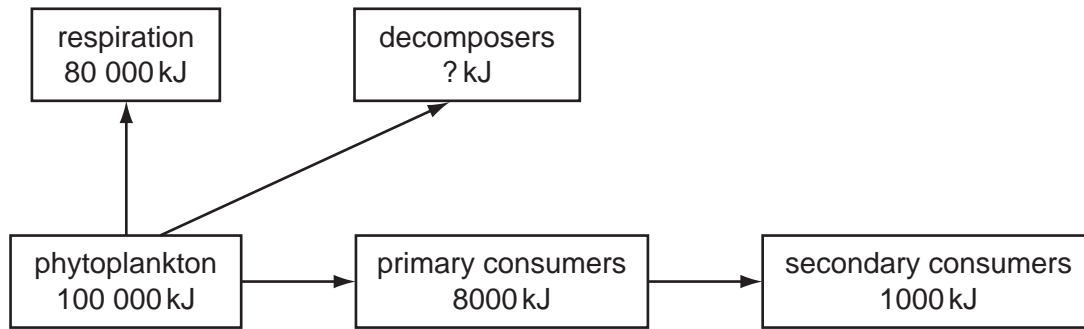


Fig. 6.1

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.

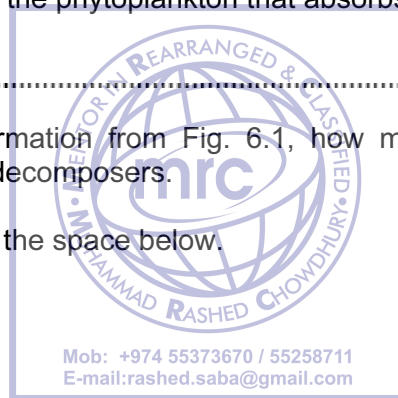
..... [1]

(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]

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

For
Examiner's
Use

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.

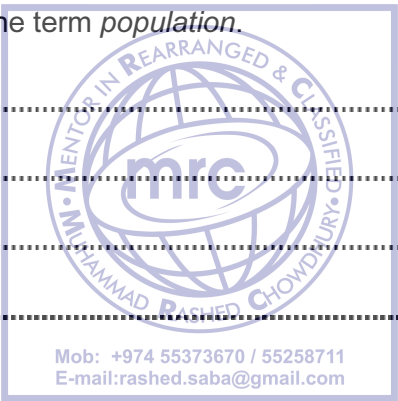
Explain what is meant by the term *population*.

.....

.....

.....

..... [2]



[Total: 12]

7 Fig. 7.1 shows a carbon cycle.

For
Examiner's
Use

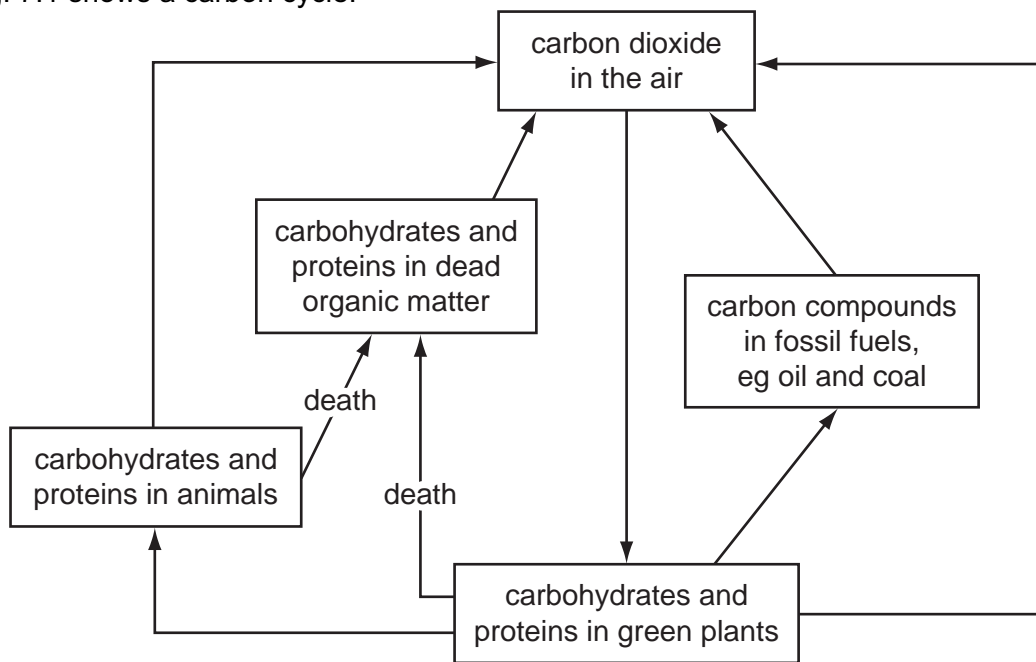


Fig. 7.1

(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]

8 Fig. 8.1 shows a section through the heart.

For
Examiner's
Use

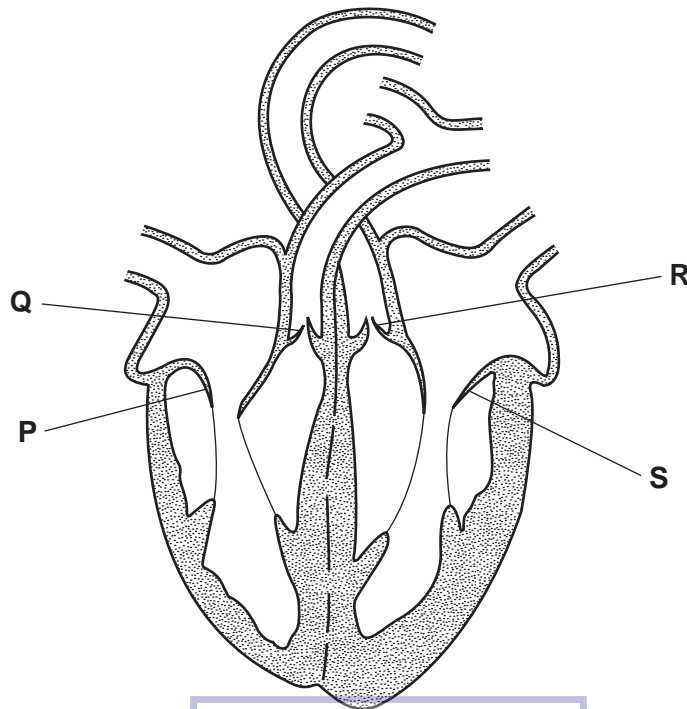


Fig. 8.1

(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]

(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]

For
Examiner's
Use



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

For
Examiner's
Use

.....

.....

.....

.....

.....

..... [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]

Copyright Acknowledgements:

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.

University of 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.