UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

7086325838

BIOLOGY **0610/21**

Paper 2 Core **October/November 2010**

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 **14** printed pages and **2** blank pages.

© UCLES 2010

For Examiner's Use

1 **(a)** Fig. 1.1 shows a mammal.

Fig. 1.1

Describe two external features that occur in mammals but do **not** occur in other vertebrates.

1. .....

.....

2. .....

..... [2]

(b) Fig. 1.2 shows an arthropod.

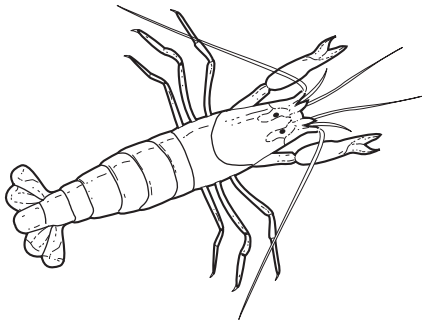

Fig. 1.2

Describe two external features that occur in all arthropods.

1. .....

.....

2. .....

..... [2]

[Total: 4]

© UCLES 2010

For Examiner's Use

2 Fig. 2.1 shows a population growth graph for a herbivorous insect that has just entered a new habitat.

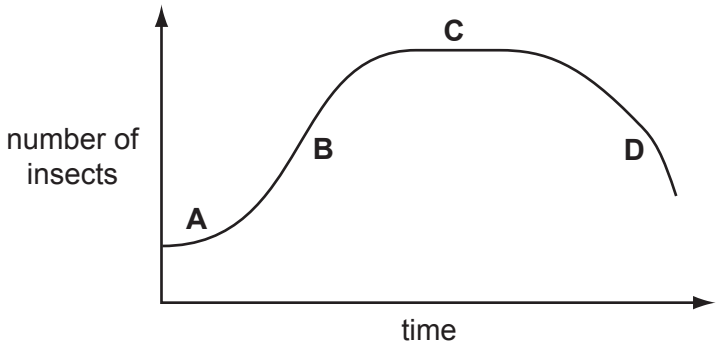

Fig. 2.1

(a) (i) Which of the four phases, labelled **A**, **B**, **C** and **D**, represents the stationary phase and which the lag phase?

stationary phase .....

lag phase ..... [2]

(ii) During which phases will some of this insect population die?

phases ..... [2]

(b) (i) State two factors that could affect the rate of population growth during phase **C**.

factor 1 .....

factor 2 ..... [2]

(ii) Suggest how these two factors might change. Explain how each change would affect the rate of population growth.

factor 1 .....

.....

.....

factor 2 .....

.....

..... [4]

[Total: 10]

For Examiner's Use

3 Fig. 3.1 shows a section through the heart.

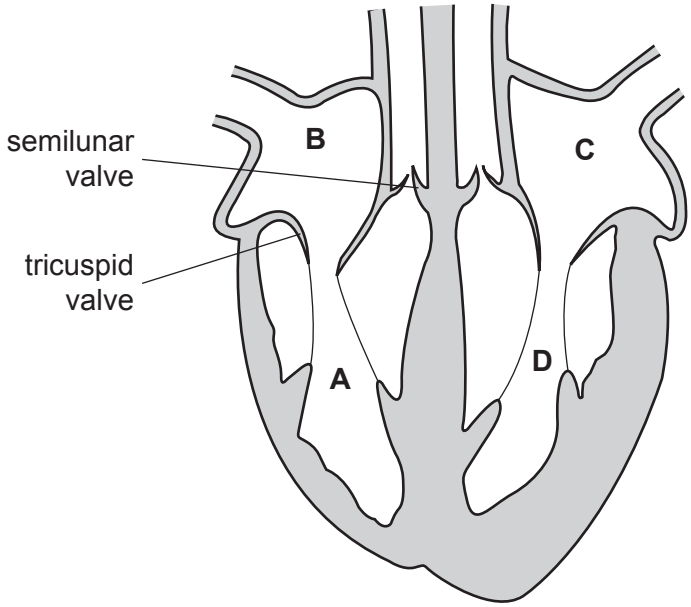

Fig. 3.1

(a) (i) Name the chamber of the heart labelled **D**.

..... [1]

(ii) State which of the chambers, **A** to **D**, contain deoxygenated blood.

..... [1]

(b) The pulmonary blood vessels carry blood into and away from the heart.

Complete Table 3.1 to give three differences between the pulmonary artery and the pulmonary vein.

Table 3.1

	pulmonary artery	pulmonary vein
1		
2		
3		

[3]

For Examiner's Use

(c) (i) State the function of the valves within the heart.

.....

[1]

(ii) Suggest what causes the tricuspid valve to open.

.....

.....

[2]

(iii) Suggest why it is important that when the semilunar valves are open, the tricuspid and bicuspid valves are closed.

.....

.....

.....

[2]

[Total: 10]

For Examiner's Use

4 Fig. 4.1 shows a section through a leaf.

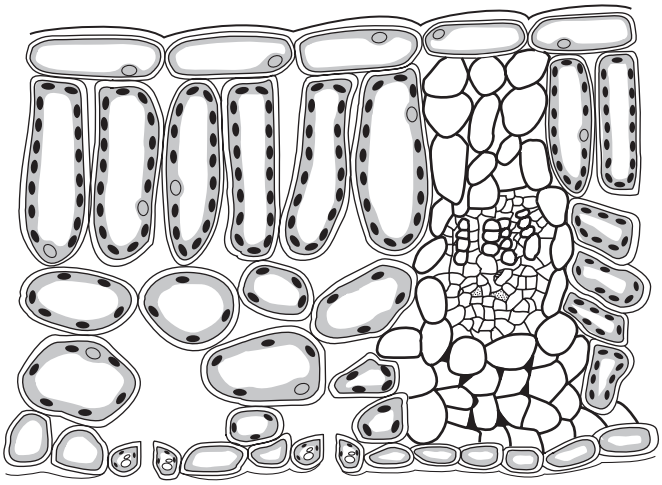

Fig. 4.1

(a) On Fig. 4.1, label a stoma, the cuticle and a vascular bundle.

Use label lines and the words 'stoma', 'cuticle' and 'vascular bundle' on Fig. 4.1. [3]

(b) (i) The upper layers of a leaf are transparent. Suggest an advantage to a plant of this feature.

.....

..... [1]

(ii) The cuticle is made of a waxy material. Suggest an advantage to a plant of this feature.

.....

..... [1]

(iii) State two functions of vascular bundles in leaves.

1. .....

.....

2. .....

..... [2]

© UCLES 2010

For Examiner's Use

(c) Most photosynthesis in plants happens in leaves.

(i) Name the two raw materials needed for photosynthesis.

1. .....

2. ..... [2]

(ii) Photosynthesis produces glucose.

Describe how plants make use of this glucose.

.....

.....

.....

.....

..... [3]

[Total: 12]

For Examiner's Use

5 (a) (i) In the box, state the word equation for aerobic respiration.

[2]

(ii) Complete Table 5.1 to show three differences between aerobic respiration and anaerobic respiration in humans.

Table 5.1

	aerobic respiration in humans	anaerobic respiration in humans
1	…… ……	…… ……
2	…… ……	…… ……
3	…… ……	…… ……

[3]

For Examiner's Use

(b) Yeast is used in making some types of bread and in brewing.

(i) Explain the role of yeast in bread making.

.....

.....

.....

.....

..... [3]

(ii) Explain the role of yeast in brewing.

.....

.....

.....

..... [2]

[Total: 10]

6 Complete the sentences by writing the most appropriate word in each space.

Use only words from the box.

allele	diploid	dominant	gene
genotype	haploid	heterozygous	homozygous
meiosis	mitosis	phenotype	recessive

Wing length in the fruit fly, *Drosophila*, is controlled by a single ..... that has two forms, one for long and one for short wings. The sperm and ova of fruit flies are produced by the process of ..... . When fertilisation occurs the gametes fuse to form a ..... zygote.

When two long-winged fruit flies were crossed with each other some of the offspring were short-winged. The ..... of the rest of the offspring was long-winged. The short-winged form is ..... to the long-winged form and each of the parents must have been ..... . [6]

[Total: 6]

For Examiner's Use

7 Suggest and explain three ways in which human activities can bring about air pollution. In each case, name the pollutant.

For Examiner's Use

1. .....

.....

.....

.....

2. .....

.....

.....

.....

3. .....

.....

.....

..... [6]

[Total: 6]

For Examiner's Use

8 Fig. 8.1 shows a section through a pea flower.

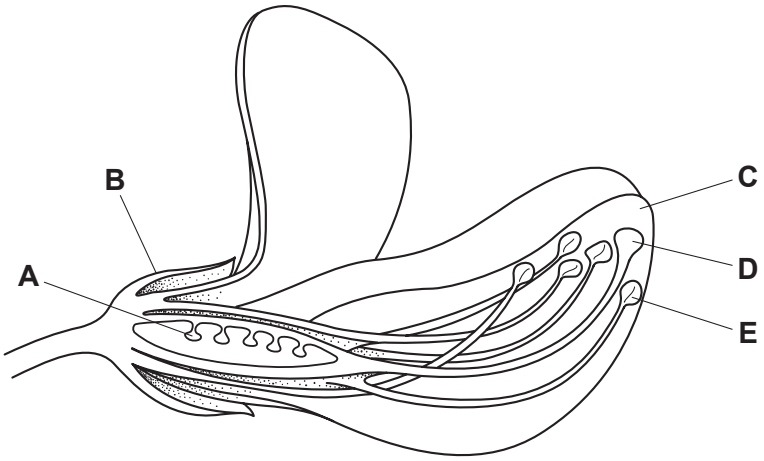

Fig. 8.1

(a) Name the parts labelled **A** and **B**.

A .....

B ..... [2]

(b) This flower is insect-pollinated.

(i) Define the term *pollination*.

.....

.....

..... [2]

(ii) Suggest how parts **C**, **D** and **E** work together to bring about insect-pollination in this flower.

.....

.....

.....

..... [3]

© UCLES 2010

For Examiner's Use

(c) Suggest how a wind-pollinated flower would be different from the flower shown in Fig. 8.1.

.....

.....

.....

.....

.....

..... [4]

(d) After both pollination and fertilisation have happened, a flower produces seeds.

These seeds can germinate and grow into new plants.

For germination to happen a number of environmental factors must be present, including oxygen, a suitable temperature and water.

Explain why each of these three factors is essential for successful germination.

oxygen .....

.....

suitable temperature .....

.....

water .....

..... [3]

[Total: 14]

For Examiner's Use

9 **(a)** The kidney is an excretory organ.

Name two other excretory organs in humans and in each case state a substance that the organ excretes.

1. organ .....

substance excreted .....

2. organ .....

substance excreted ..... [4]

(b) Table 9.1 shows the amounts of some substances in the blood in the renal artery and in the renal vein of a **healthy** person.

Table 9.1

substance	amount in blood in renal artery (arbitrary units)	amount in blood in renal vein (arbitrary units)
oxygen	100.0	35.0
glucose	10.0	9.7
sodium salts	32.0	29.0
urea	3.0	0.5
water	180.0	178.0

Suggest what happens in the kidney to bring about the differences in the composition of the blood shown in Table 9.1.

.....

.....

.....

.....

.....

..... [4]

[Total: 8]

© UCLES 2010

BLANK PAGE

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.

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.