Second variant Question Paper

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

1850128832

BIOLOGY **0610/03**

Paper 3 Extended **October/November 2007**

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.

Answer **all** questions.
DO **NOT** WRITE IN ANY BARCODES.
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	
Total	

Q

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

1 Fig. 1.1 shows a diagram of a bacterial cell.

For Examiner's Use

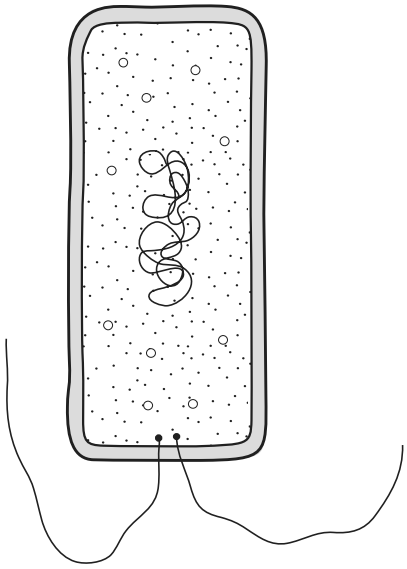

Fig. 1.1

(a) (i) State four structural features, present in a photosynthesising plant cell, that make it different from the bacterial cell in Fig. 1.1.

1. .....

2. .....

3. .....

4. ..... [4]

(ii) State two structural features present in both the bacterial cell in Fig. 1.1 and in an animal cell, such as a liver cell.

1. .....

2. ..... [2]

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(b) Bacteria are examples of microorganisms.

State two different types of food manufactured using microorganisms.

1. .....

2. ..... [2]

(c) Many bacterial diseases can no longer be treated with antibiotics. Outline how antibiotic-resistant strains of bacteria can develop.

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..... [3]

(d) Explain why bacteria, in particular, are very useful organisms in the process of genetic engineering.

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..... [2]

[Total: 13]

For Examiner's Use

2 Fig. 2.1 shows the position of some of the teeth and salivary glands associated with the digestion of food in the mouth.

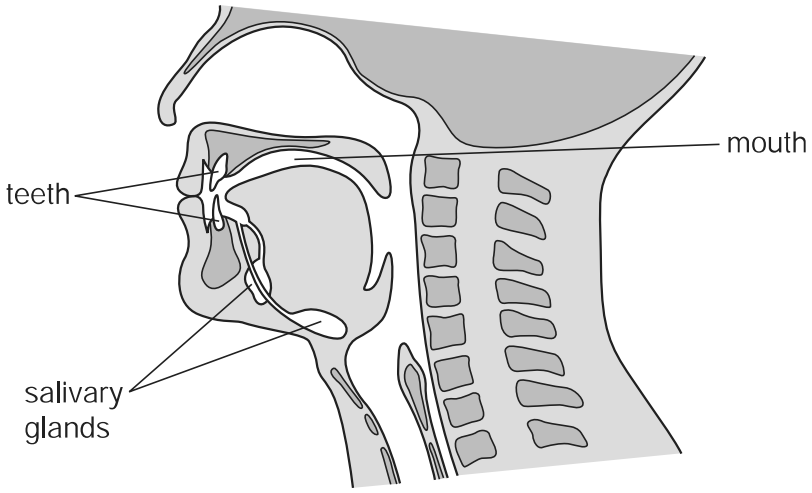

Fig. 2.1

(a) (i) Describe the role of the salivary glands in the digestion of food in the mouth.

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..... [3]

(ii) Describe the **physical** changes to food that are brought about by the action of the molar teeth.

Explain how these changes help digestion.

Description .....

.....

Explanation .....

.....

..... [3]

(b) Humans who have a diet rich in sugar often suffer from tooth decay.

Explain how tooth decay is brought about.

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.....

.....

..... [3]

For Examiner's Use

(c) Scientists have found evidence that fluoride in the diet helps to reduce tooth decay.

Explain how fluoride may help to reduce tooth decay.

.....

..... [1]

(d) In some parts of the world, fluoride is added to the drinking water supply.

Outline why some people are opposed to this.

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..... [3]

[Total: 13]

For Examiner's Use

3 **(a)** Define the term *excretion*.

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..... [3]

(b) Fig. 3.1 shows a section through a kidney.

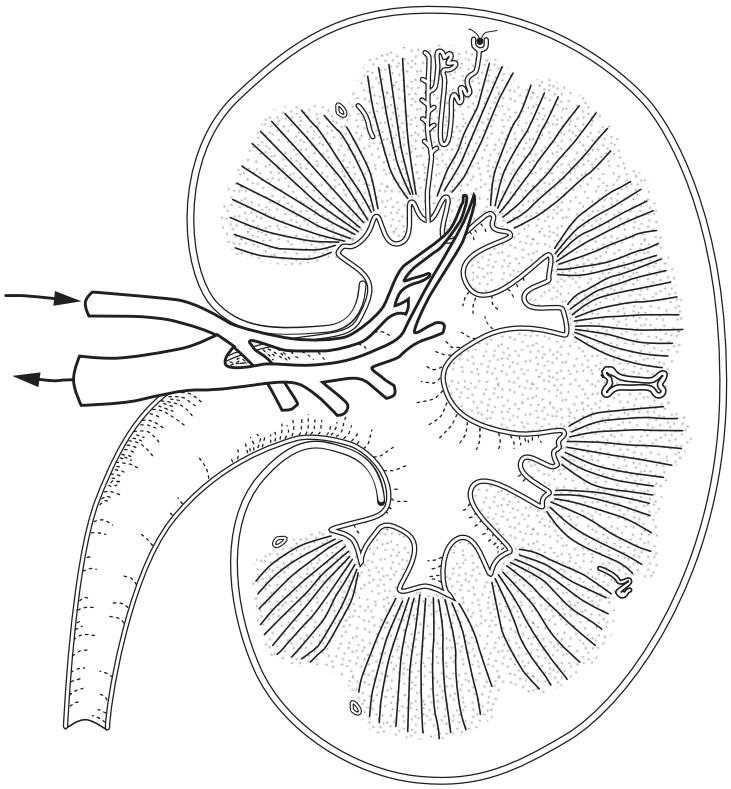

Fig. 3.1

(i) Using label lines and the letters given, label the following on Fig. 3.1.

F where filtration occurs,

R the renal artery,

U where urine passes to the bladder. [3]

(ii) Describe the process of filtration in the kidney.

For Examiner's Use

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..... [3]

(iii) Name the processes resulting in the reabsorption of

1. glucose, ...

2. water. ..... [3]

[Total: 12]

4 Fig. 4.1 shows a diagram of a section through the male reproductive organs.

For Examiner's Use

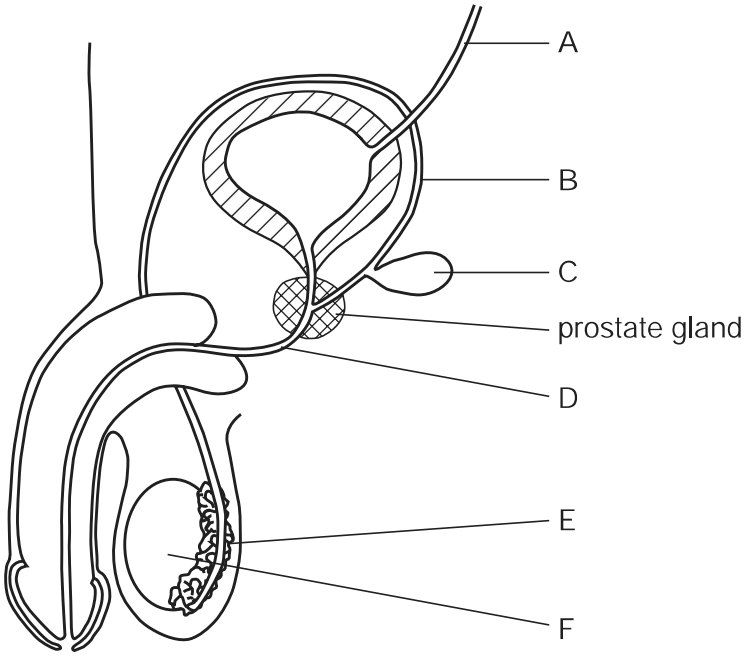

Fig. 4.1

(a) Complete the table by using the labels from Fig. 4.1 to identify each of the structures described. The first has been done for you.

description of structure	**label letter**
carries both urine and semen	**D**
where sperm are stored before ejaculation	
is cut or tied during a vasectomy	
produces fluid for sperm to swim in	
where meiosis occurs	

[4]

(b) In older men the prostate gland often enlarges, reducing the diameter of tube **D**.

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(i) State the name of tube **D**.

..... [1]

(ii) Suggest and explain why a reduction in the diameter of this tube may cause a problem.

.....

.....

..... [2]

(c) Some processes in the body involve the deliberate narrowing of structures.

Outline **one** situation in the body where there is a mechanism to reduce the diameter of a structure for a particular purpose.

State the effect of this reduction in diameter.

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..... [3]

(d) Hormones can be used as a birth control mechanism and also to increase fertility.

Describe the use of **named** hormones in

1. fertility drugs,

2. chemical methods of birth control.

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..... [6]

[Total: 16]

For Examiner's Use

For Examiner's Use

5 **(a)** State the role of gaseous exchange surfaces.

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..... [1]

(b) Fig. 5.1 shows a section through the skin of an earthworm. The skin acts as the earthworm's gaseous exchange surface.

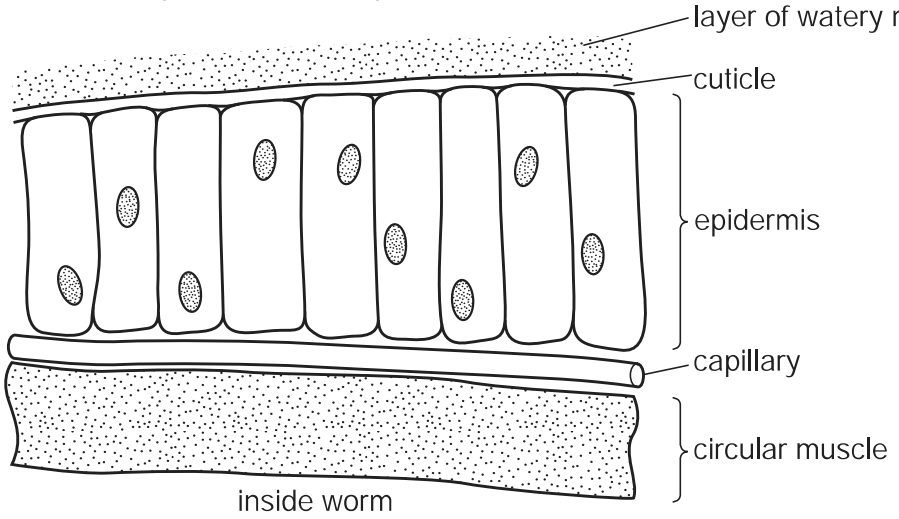

Fig. 5.1

Describe two features, **visible in Fig. 5.1**, which make this surface well adapted for gaseous exchange.

1. .....

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2. .....

..... [2]

(c) Pea seeds begin to germinate when soaked in water. When the seeds germinate they respire aerobically, releasing energy.

(i) Suggest why seeds need water to germinate.

.....

..... [1]

(ii) Suggest why the seeds need energy during germination.

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..... [1]

(d) Fig. 5.2 shows apparatus that can be used to investigate the uptake of oxygen by germinating pea seeds.

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Soda lime absorbs carbon dioxide.

Any changes in gas volumes in the boiling tube containing the peas will result in movement of the oil droplet.

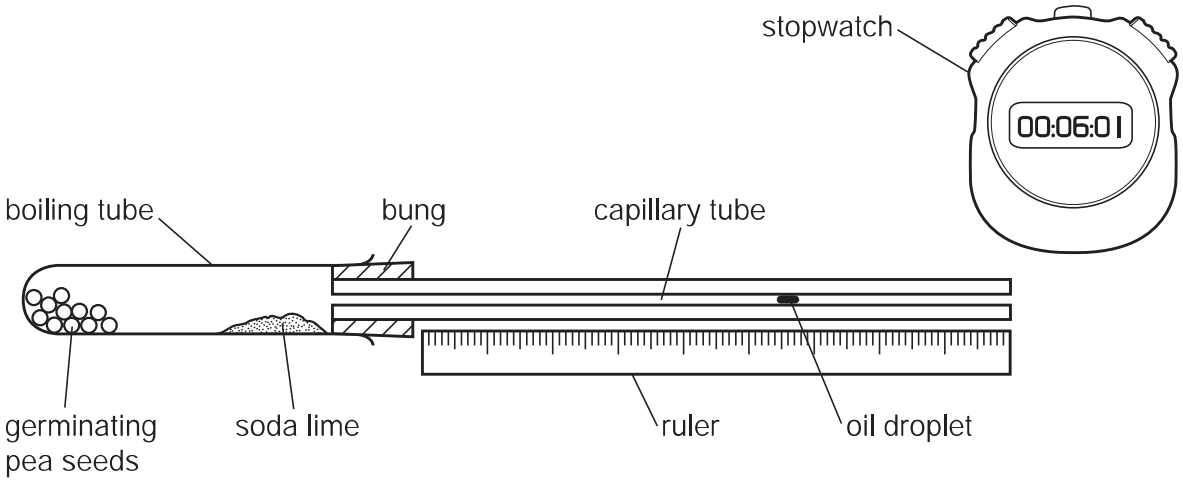

Fig. 5.2

(i) Describe **and** explain what would happen to the position of the oil droplet as the peas respire aerobically.

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..... [3]

(ii) Describe how the apparatus could be used to measure the **rate** of aerobic respiration of the peas at different temperatures.

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..... [5]

(iii) Suggest why temperature affects the rate of respiration.

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..... [2]

[Total: 15]

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6 Lake Victoria is the largest tropical lake in the world. Until the 1960s it provided an ecosystem with habitats for 500 species of small cichlid fish. They feed on algae (aquatic plants). Prawns also feed on algae.

Nile perch were introduced into the lake. These fish are excellent food for humans, as well as providing sport for tourists. The Nile perch eat cichlids.

Deforestation of the lake shore and pollution by humans caused eutrophication and resulted in a huge reduction in cichlid numbers. However, the Nile perch are able to survive in poor quality water, even when the oxygen level is low. As the cichlid population dropped, prawn numbers increased and Nile perch now eat them.

(a) Define the term *ecosystem*.

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..... [2]

(b) Using information in the text above, state two reasons why Nile perch were introduced into Lake Victoria.

1. .....

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2. .....

..... [2]

(c) Complete the table to identify at which trophic level each of the organisms named in the text are feeding.

algae **cichlid fish** **human** **Nile perch** **prawn**

trophic level	**organism(s)**
producer	
herbivore	
carnivore	

[3]

(d) Explain how eutrophication could have resulted in a reduction in the numbers of cichlid fish.

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..... [4]

[Total: 11]

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