

Centre Number	Candidate Number	Name
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UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

**HUMAN AND SOCIAL BIOLOGY**

**5096/02**

Paper 2

October/November 2004

**2 hours**

Additional Materials: Answer Paper

**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 soft pencil for any diagrams, graphs or rough working.  
Do not use staples, paper clips, highlighters, glue or correction fluid.

**Section A**

Answer **all** questions.  
Write your answers in the spaces provided on the question paper.  
You are advised to spend no longer than 1 hour on Section **A**.

**Section B**

Answer **all** the questions, including questions 8, 9 and 10 **Either** or 10 **Or**.  
Write your answers to questions 8, 9 and 10 on the separate answer paper provided.  
At the end of the examination,

1. fasten all your work securely together;
2. write an E (for Either) or an O (for Or) next to the number 10 in the grid below to indicate which question you have answered.

The number of marks is given in brackets [ ] at the end of each question or part question.

If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

For Examiner's Use	
<b>Section A</b>	
<b>Section B</b>	
<b>8</b>	
<b>9</b>	
<b>10</b>	
<b>TOTAL</b>	

Section A

Answer all the questions.

Write your answers in the spaces provided.

1 (a) A student made a key to identify the following:

*bacterium; flatworm; fungus; insect; protozoan; virus.*

- |   |  |   |
|---|--|---|
| 1 | no nucleus present                     | 2 |
|   | nucleus present                        | 3 |
| 2 | parasitic, reproducing in living cells | A |
|   | not all parasitic, cell walls present  | B |
| 3 | made of hyphae                         | C |
|   | not made of hyphae                     | 4 |
| 4 | unicellular, reproduce by fission      | D |
|   | multicellular with exoskeleton         | E |

Use the key to identify A to E.

- A .....
- B .....
- C .....
- D .....
- E .....

[5]

(b) Fig. 1.1 shows two red blood cells, R and S. R was put into blood plasma, while S was put into a solution that had a higher concentration of salt than plasma.

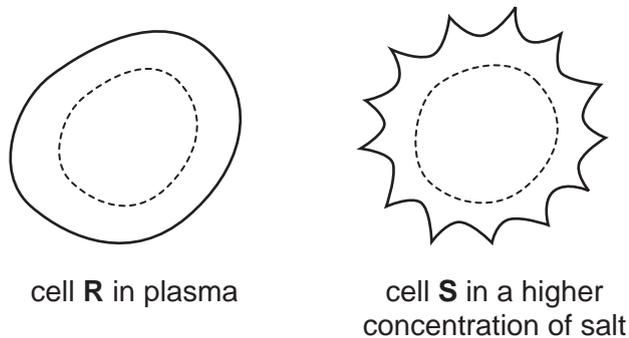


Fig. 1.1

- (i) Name the substance that has been lost from cell S. ....[1]
- (ii) Name the process which caused this loss. ....[1]

(iii) State what would happen if cell **R** was transferred to distilled water and your answer.

.....  
.....[2]

(iv) Name the **organ** that is responsible for keeping the concentration of blood plasma constant.

..... [1]

(c) Fig. 1.2 shows some of the many types of cells in the body, not all drawn to the same scale.

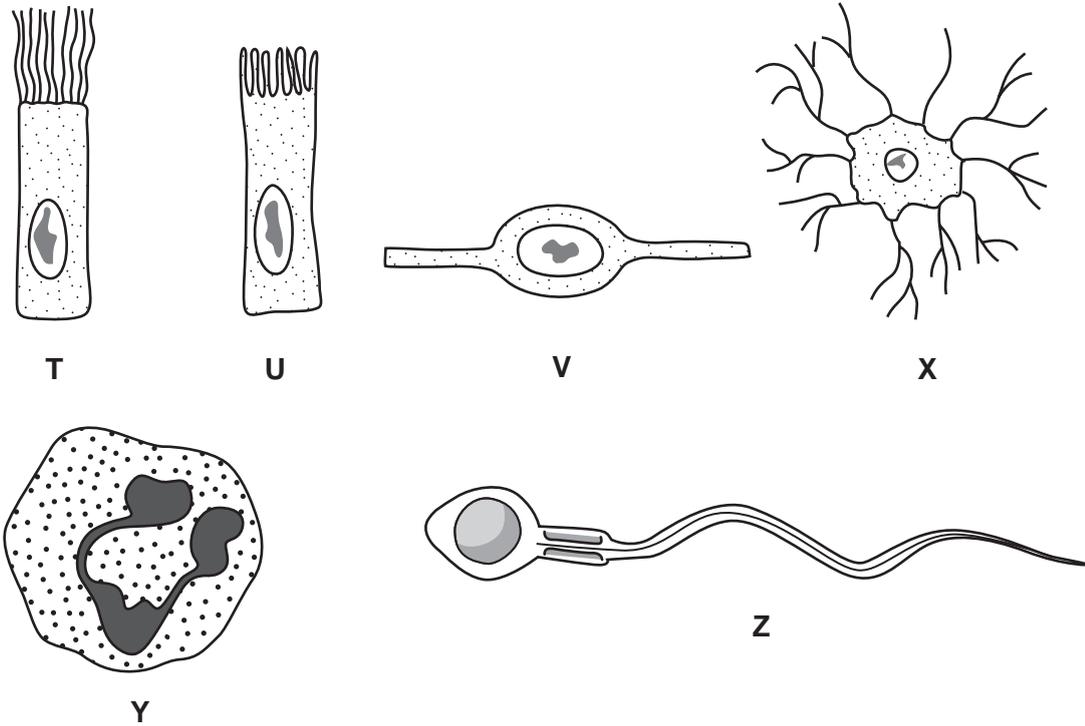


Fig. 1.2

(i) Cells **T**, **U** and **V** line different tubes in the body. Name the tubes lined by

**T**, .....

**U**, .....

**V**, .....

[3]

(ii) Cell **X** is a bone cell. State two advantages of having living cells in a bone.

1. ....

2. ....[2]

(iii) What can **Y** and **Z** both do that the others cannot? .....[1]

(iv) State how the nucleus of **Z** differs from that of the other cells in Fig. 1.2.

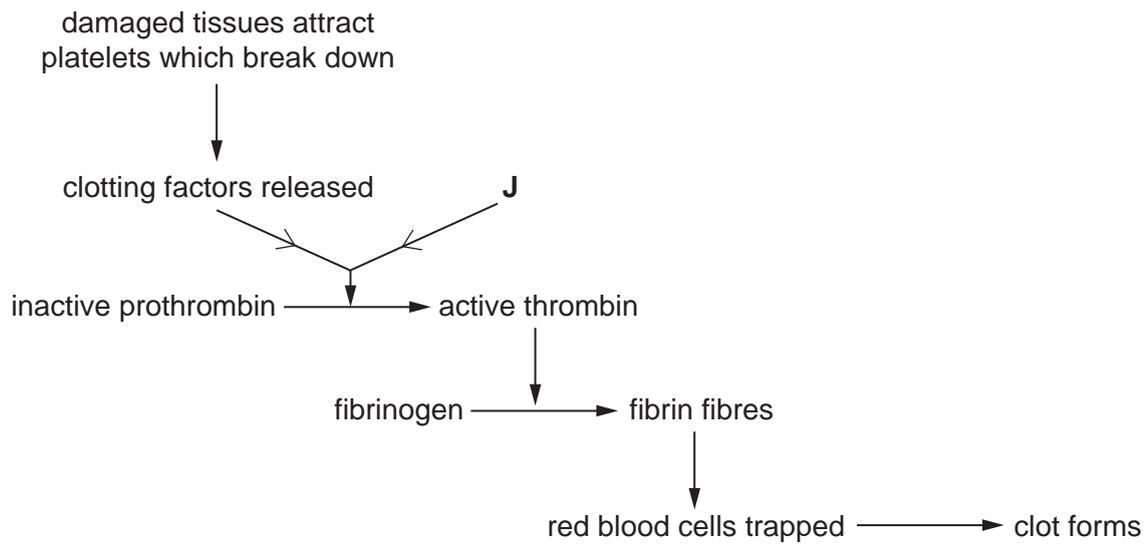
.....

(v) Describe how you would prepare a slide of liver cells to look at under the microscope.

.....  
.....  
.....  
.....  
.....  
.....[3]

[Total : 20]

2 Fig. 2.1 shows an outline of the reactions leading to the formation of a clot.

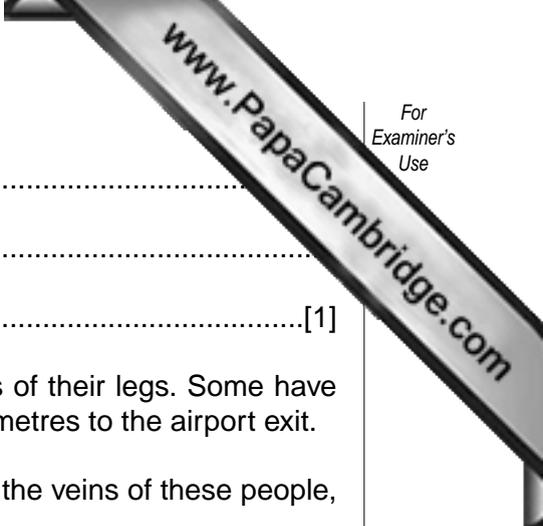


**Fig. 2.1**

(a) Name **two** constituents of a blood clot. ....  
.....[1]

(b) State two advantages of blood clotting.

1. ....
2. ....[2]



(c) On Fig. 2.1, **J** is an ion. Name it. ....[1]

(d) How does **fibrinogen** differ from **fibrin**?.....[1]

(e) Passengers on long air flights may develop clots in the veins of their legs. Some have proved fatal, but only after the person has walked a hundred metres to the airport exit.

Suggest and explain what may have happened to the clots in the veins of these people, as they walked to the airport exit.

.....[4]

[Total : 9]

3 Fig. 3.1 shows two larvae, one of the housefly and the other of a mosquito.

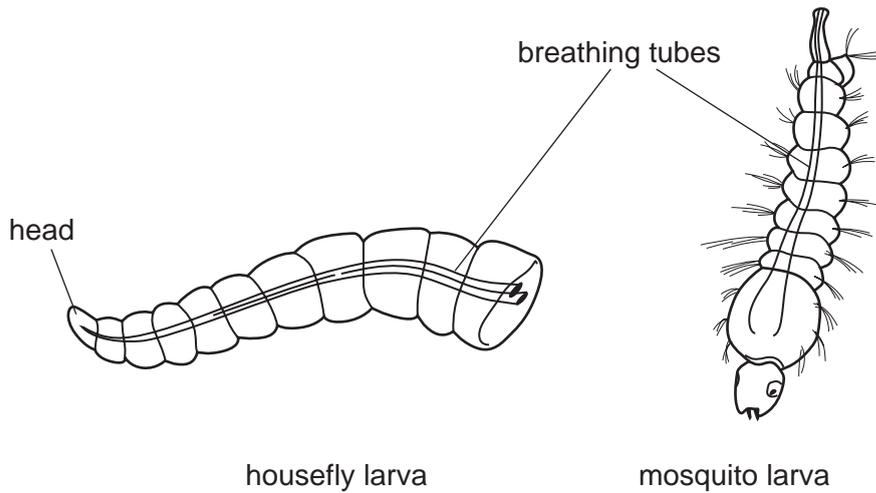


Fig. 3.1

(a) In both larvae the breathing tubes open at the extreme rear end of the body. From a knowledge of their habitats, explain why this is an advantage to each animal.

- 1. housefly .....
- .....
- 2. mosquito .....
- .....[2]

(b) A student observed some housefly larvae and found that they moved away from the light. Suggest two advantages to the larvae of this behaviour.

- 1. ....
- .....
- 2. ....
- .....[2]

(c) In each of these insects, only the **adult** can transmit disease. State how each of these insects first becomes infected.

- 1. housefly .....
- .....
- 2. mosquito .....
- .....[2]

[Total : 6]

4 Fig. 4.1 shows the reproductive organs of a man who has had a vasectomy.

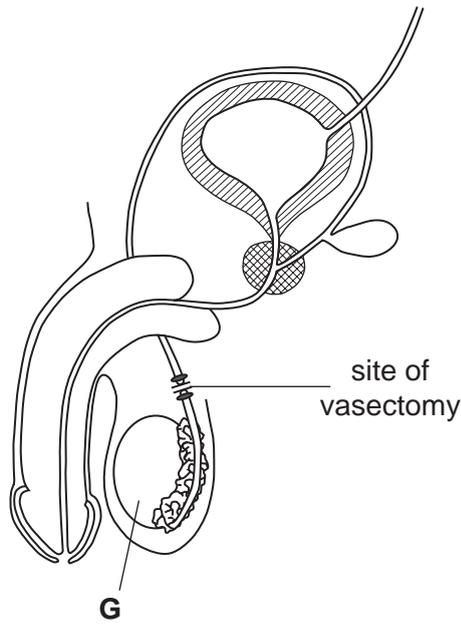


Fig. 4.1

(a) State two products of organ G.

1. ....

2. ....

[2]

(b) Explain the advantages **and** disadvantages of vasectomy as a method of birth control.

.....

.....

.....

.....[3]

[Total : 5]

- 5 Fill in Table 5.1 to identify the different types of immunity.

Use one of the following terms for each answer:

*artificial active; natural active; artificial passive; natural passive.*

**Table 5.1**

immunity obtained from	type of immunity obtained
a vaccine	
a serum	
mother's milk	
catching a disease and recovering	

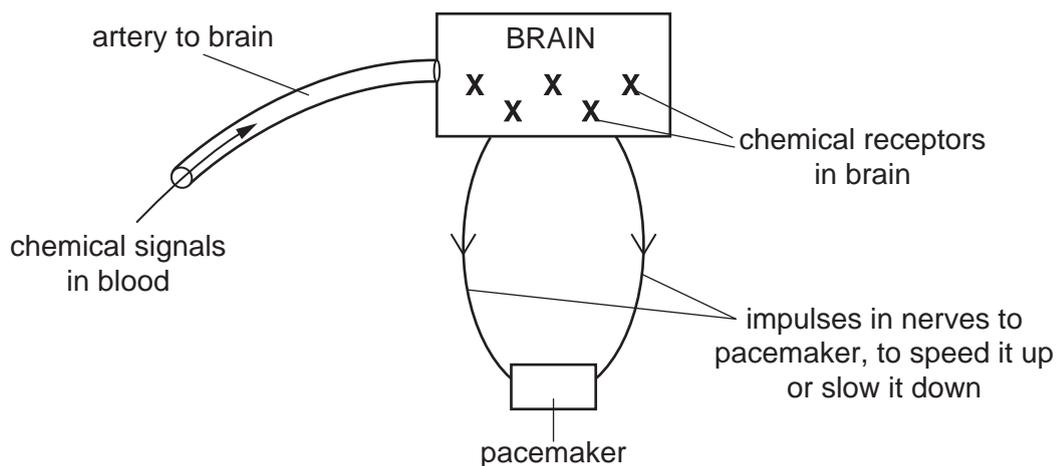
[Total : 4]

- 6 Heart muscles have their own pacemaker, unlike skeletal muscles which require nervous stimulation to make them contract.

- (a) Describe the function of the pacemaker in the heart.

.....  
 .....[2]

- (b) Fig. 6.1 shows how the rate of the pacemaker is regulated by impulses from the brain, in response to chemical signals in the blood passing through the brain.



**Fig. 6.1**

Suggest three **chemical** changes in the blood brought about by exercise that signal the brain to speed up the heart and breathing.

1. ....
2. ....
3. ....[3]

[Total : 5]

7 Cystic fibrosis is an inherited condition brought about by having two recessive alleles. Fig. 7.1 shows the inheritance of this condition in two families linked by marriage.

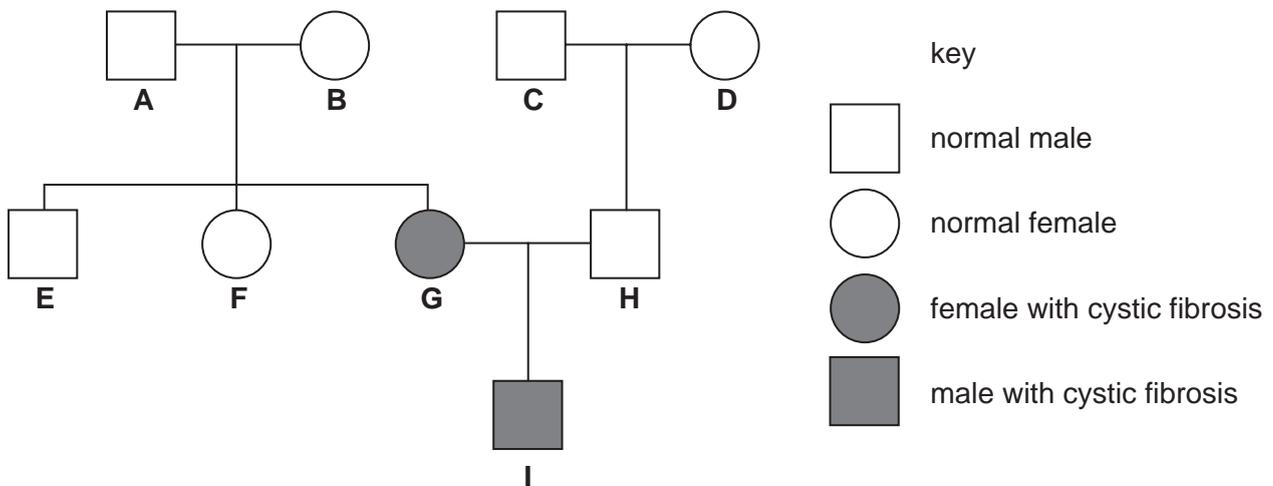


Fig. 7.1

(a) Using **T** for the normal allele and **t** for the allele that causes cystic fibrosis, write in the genotypes of the individuals **A**, **B**, **G** and **H**.

- A** .....
- B** .....
- G** .....
- H** .....

[4]

(b) What is the chance that the next child born to **G** and **H**:

- (i) has cystic fibrosis, .....
- (ii) is a **female** with cystic fibrosis? .....

[1]

[1]

[Total : 6]

## Section B

Answer **all** the questions, including questions 8, 9 and 10 **Either** or 10 **Or**.

Write your answers on the separate answer paper provided.

- 8 Fig. 8.1 shows part of the arm.

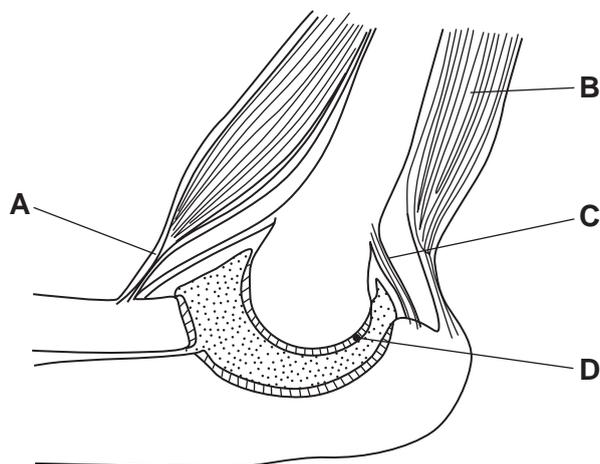


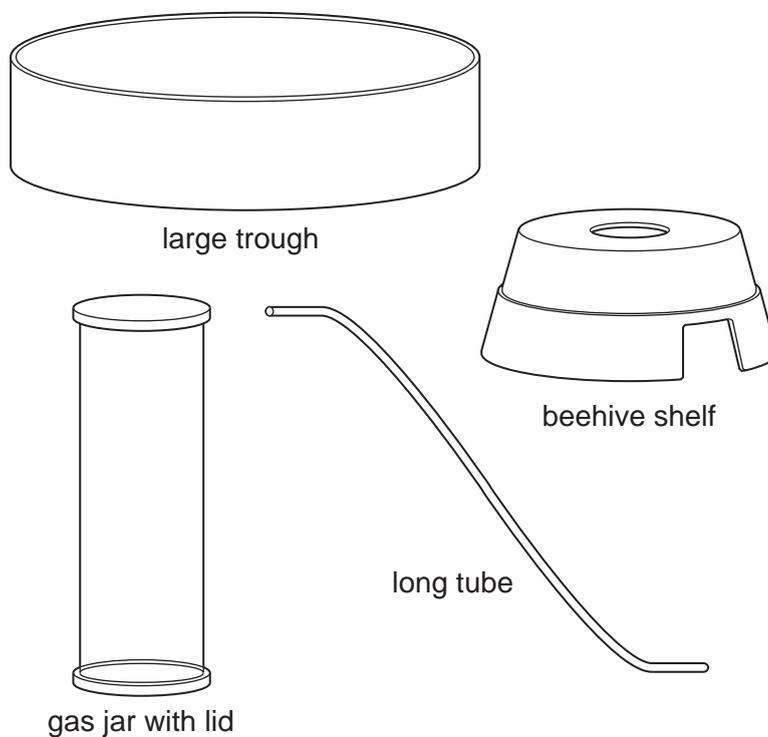
Fig. 8.1

- (a) Using Fig. 8.1, identify structures **A** to **D** and explain how each is involved in the movement of the forearm. [9]
- (b) Describe how circular muscles take part in
- peristalsis,
  - reducing the amount of light entering the eye. [6]
- 9 (a) Explain the differences between **excretion** and **egestion (defaecation)**. [4]
- (b) Describe how the kidney removes urea from the blood, while retaining useful substances. [7]
- (c) Describe the part played by antidiuretic hormone (ADH) in urine formation. [4]

Question 10 is in the form of an **Either/Or** question.  
Only answer question 10 **Either** or question 10 **Or**.

**10 Either**

(a) Fig. 10.1 shows a number of pieces of laboratory glassware.



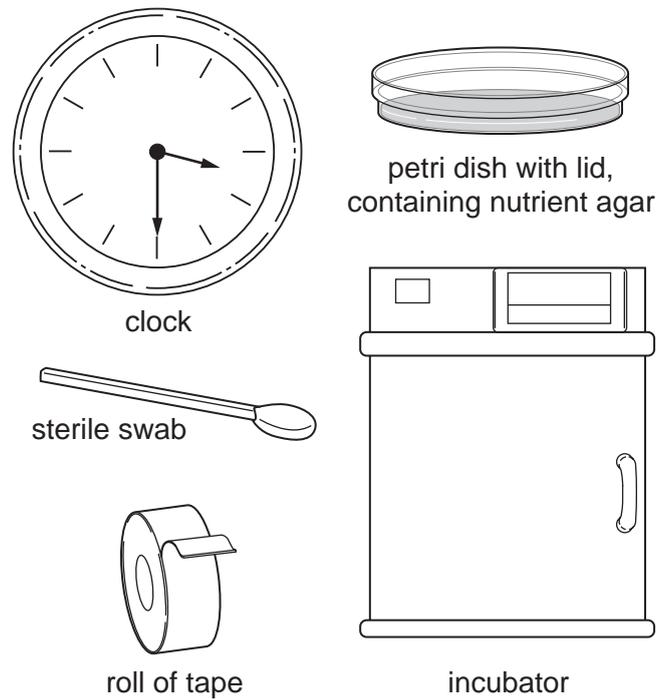
**Fig. 10.1**

Describe how you could use these to collect a sample of expired (exhaled) air. [5]

- (b) (i) How would your sample of expired air differ in composition from a similar sample of fresh air? [2]
- (ii) Which chemical constituent would have the same volume in the two samples? [1]
- (c) Describe how you would attempt to revive a person who was not breathing, by using mouth-to-mouth resuscitation. [7]

10 Or

Fig. 10.2 shows some articles of laboratory equipment.



**Fig. 10.2**

- (a) Describe how you would use the articles in Fig. 10.2 to show the presence of bacteria on your teeth. [5]
- (b) Describe how bacteria and food-remains contribute to tooth decay. [4]
- (c) Describe and explain what happens to a piece of bread when it is in the mouth. [6]