

Candidate Name \_\_\_\_\_

Centre Number	Candidate Number

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
**General Certificate of Education Ordinary Level**  
**HUMAN AND SOCIAL BIOLOGY**  
**PAPER 2**

**5096/2**

**MAY/JUNE SESSION 2002**

2 hours

Additional materials:  
Answer paper

**TIME** 2 hours

**INSTRUCTIONS TO CANDIDATES**

Write your name, Centre number and candidate number in the spaces at the top of this page and on all separate answer paper used.

**Section A**

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

**Section B**

Answer **three** questions.

Write your answers on the separate answer paper provided.

At the end of the examination,

1. fasten all separate answer paper securely to the question paper;
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.

**INFORMATION FOR CANDIDATES**

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

You are advised to spend no longer than 1 hour on Section A.

FOR EXAMINER'S USE	
<b>Section A</b>	
<b>Section B</b>	
8	
9	
10	
<b>TOTAL</b>	

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**This question paper consists of 12 printed pages.**

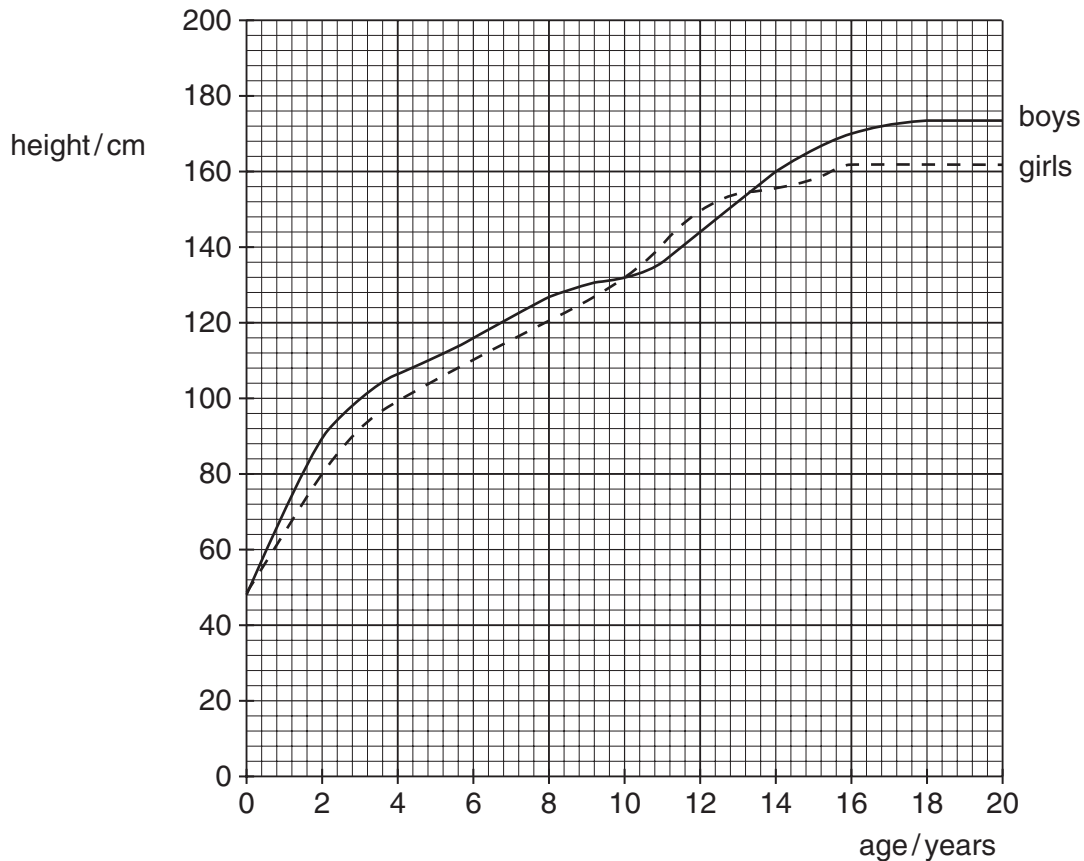


## Section A

Answer **all** the questions.

Write your answers in the spaces provided.

- 1 Fig. 1.1 shows the growth of girls and boys from birth to twenty years.



**Fig. 1.1**

- (a) Using Fig. 1.1, answer the following questions.

(i) How much taller are boys than girls at 6 years of age? ..... cm [1]

(ii) At which age do boys and girls reach a height of 100 cm?

*boys* ..... years

*girls* ..... years [2]

(iii) Between which ages are girls taller than boys?

*between age* ..... *and age* ..... [1]

(iv) At which age do boys and girls stop growing?

*boys* ..... years

*girls* ..... years [2]

(b) Apart from height, what else could have been used to measure growth?

..... [1]

(c) The most important nutrient for growth is protein.

Describe how you would test a sample of milk to show that it contained protein.

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

(d) Complete the following description of protein metabolism by filling in the blanks.

Protein digestion begins in the ..... , where the enzyme pepsin splits protein molecules into polypeptides. In the duodenum, trypsin from the ..... continues the digestion of protein. The final products of protein digestion are ..... . These are absorbed and carried by the hepatic portal vein to the ..... . Any that are surplus to requirement have their nitrogen removed. This nitrogen is made into ..... , which is sent to the kidneys for excretion. [5]

(e) Describe the stages by which urine added to the soil may become used by plants to make new protein.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....[5]

[Total : 20]

2 Fig. 2.1 shows the life cycle of the Chinese liver fluke.

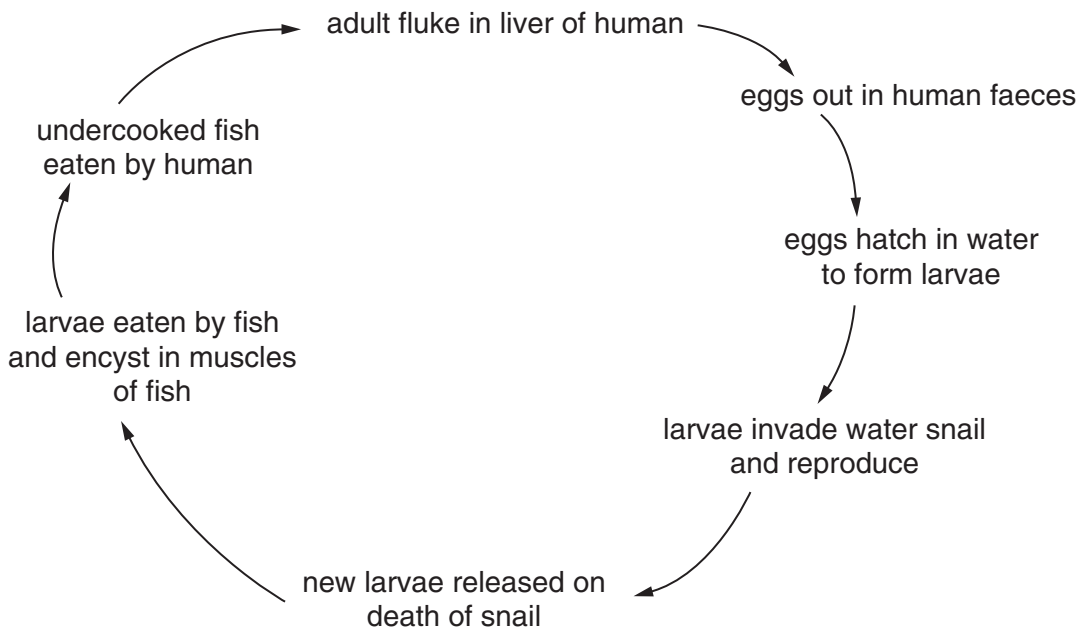


Fig. 2.1

(a) Suggest three ways to prevent the spread of this fluke.

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

(b) In this life cycle, the snail is described as a secondary host but **not** as a vector.

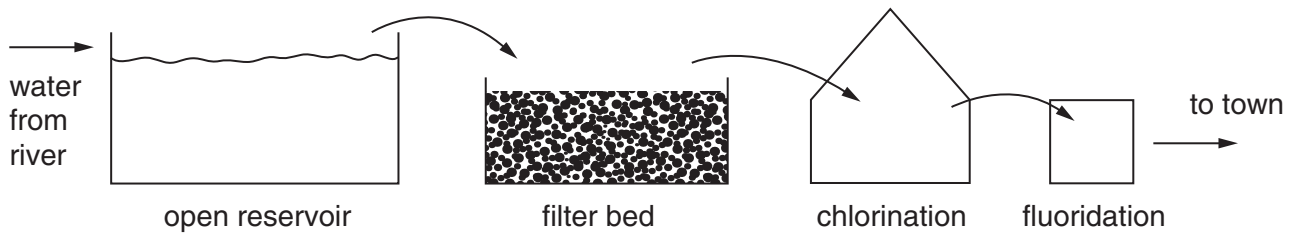
Why is this?

.....

.....[2]

[Total : 5]

3 Fig. 3.1 shows a water treatment plant.



**Fig. 3.1**

(a) What kills bacteria in the open reservoir? .....[1]

(b) Why is the chlorination tank closed to the air? .....  
.....[2]

(c) Why is fluoride added to the water? .....[1]

(d) The filter bed contains sand or gravel coated with algae and protozoa.

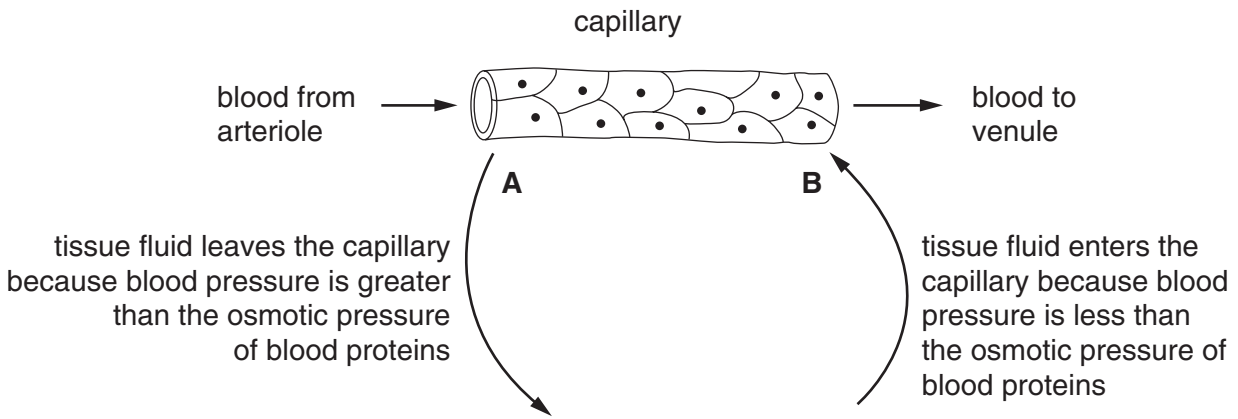
How do these organisms help to remove bacteria from the water?

*algae* .....  
.....[2]

*protozoa* .....[1]

[Total : 7]

- 4 Fig. 4.1 shows a capillary and the mechanisms by which tissue fluid is formed and returned to the blood.



**Fig. 4.1**

- (a) Which feature of the capillary wall allows fluid to pass through it easily?  
 .....[1]
- (b) What would be the effect of raised blood pressure on
- (i) the formation of tissue fluid at **A**, .....[1]
- (ii) the return of tissue fluid at **B**? .....[1]
- (c) Suggest why children suffering from a lack of protein in their blood may have their tissues swollen with excess tissue fluid.  
 .....  
 .....  
 .....[3]
- (d) By which other route may tissue fluid leave the tissues?  
 .....[1]

[Total : 7]

- 5 Table 5.1 shows a number of pathogens, their mode of entry to the body and the diseases that they cause.

Complete Table 5.1 by filling in the gaps.

**Table 5.1**

pathogen	mode of entry	disease
	breathed in	influenza
bacterium	intercourse	
bacterium	food from carriers	
fungus	contact	
	insect bite	malaria
virus	intercourse	

[Total : 6]

- 6 Table 6.1 shows the percentage blood flow to different organs of the body at rest and then during heavy exercise.

**Table 6.1**

organ	percentage blood flow at rest	percentage blood flow during exercise
heart tissue	4	4
skin	9	2
brain	13	3
kidneys	19	1
gut	24	1
muscle	22	88
other organs	9	1

- (a) From the figures in Table 6.1,
- (i) state which **two** organs show the **greatest reduction** in percentage blood flow during exercise;  
 .....[1]
- (ii) state by how many **times** blood flow to the muscles is increased during exercise.  
 ..... [1]
- (b) (i) Which process in the muscles supplies them with the energy to contract?  
 .....[1]
- (ii) Which two substances will the muscles remove from the blood for this process to occur?
1. ....
2. .... [2]

[Total : 5]



7 (a) Tendons and ligaments consist of cells and the fibres they produce.

Which type of tissue are tendons and ligaments?

.....[1]

(b) Complete Table 7.1 to show the differences between tendons and ligaments.

**Table 7.1**

feature	tendon	ligament
type of fibre		
function		

[4]

[Total : 5]

**Section B**

Answer **three** questions.

Question **10** is in the form of an **Either/Or** question. Only one part should be answered.

Write your answers on the separate answer paper provided.

- 8 (a)** An enzyme is often described as a **biological catalyst**.
- (i) What is meant by the term *catalyst*? [2]
  - (ii) State **three** properties of an enzyme apart from those in (i) above. [3]
- (b)** Describe, in detail, how you would show that your saliva contains an enzyme that changes a starch solution to a sugar solution. [6]
- (c)** From your knowledge of enzymes, suggest why the following methods of food preservation are effective.
- (i) adding vinegar
  - (ii) freezing
- [4]

[Total : 15]

- 9 (a) (i)** Describe how bacteria in the air are prevented from reaching the alveoli in the lungs. [5]
- (ii)** How does smoking reduce the effectiveness of the mechanisms you describe in (i)? [3]
- (b) (i)** Women who smoke during pregnancy have smaller babies than those who do not smoke. Which substances in tobacco smoke are responsible for this? [2]
- (ii)** Explain how these substances enter the mother's blood, pass into the fetus and how each produces its effects in the fetus. [5]

[Total : 15]

## 10 Either

Fig. 10.1 shows a method of measuring a person's reaction time.

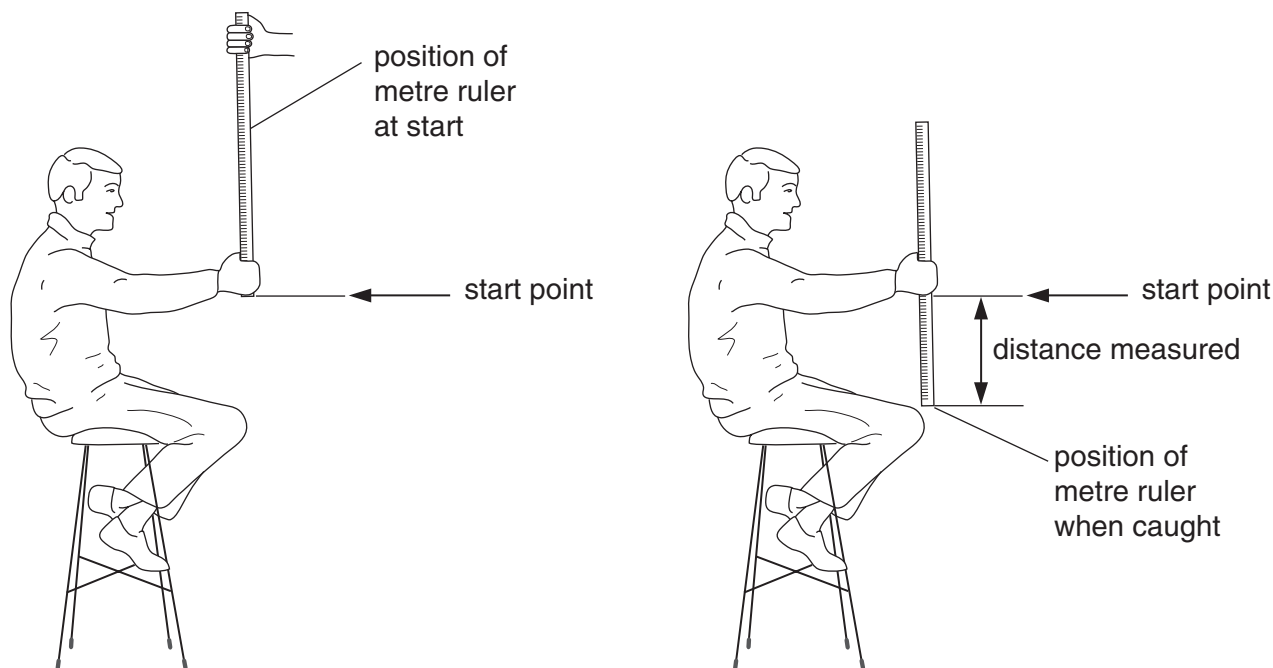


Fig. 10.1

- (a) Draw and label the nerve pathway from the eye to the muscles of the hand that enables the person to grasp the ruler, when he sees it start to fall. [5]
- (b) Describe how you could use this method to show that alcohol slows a person's reactions. [5]
- (c) How does coordination by a hormone differ from the nervous coordination described above? [5]

[Total : 15]

Or

- (a) State the differences between **antibodies** and **antibiotics**. [4]
- (b) How does a BCG vaccination give us immunity to tuberculosis? [5]
- (c) A new fungus is found growing on some bread. How would you find out if it had antibiotic properties? [4]
- (d) A new antibiotic is given a long series of trials on volunteer patients. Suggest **two** reasons for these trials. [2]

[Total : 15]

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*Copyright Acknowledgements:*

Question 1                    O.F.G. Kilgour. *Human Biology*. Guernsey Press.

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