Centre Number	Candidate Number

Candidate Name _____

CAMBRIDGE INTERNATIONAL EXAMINATIONS

General Certificate of Education Ordinary Level

HUMAN AND SOCIAL BIOLOGY 5096/2

PAPER 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	
Section A	
Section B	
8	
9	
10	
TOTAL	

This question paper consists of 12 printed pages.

[Turn over

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.

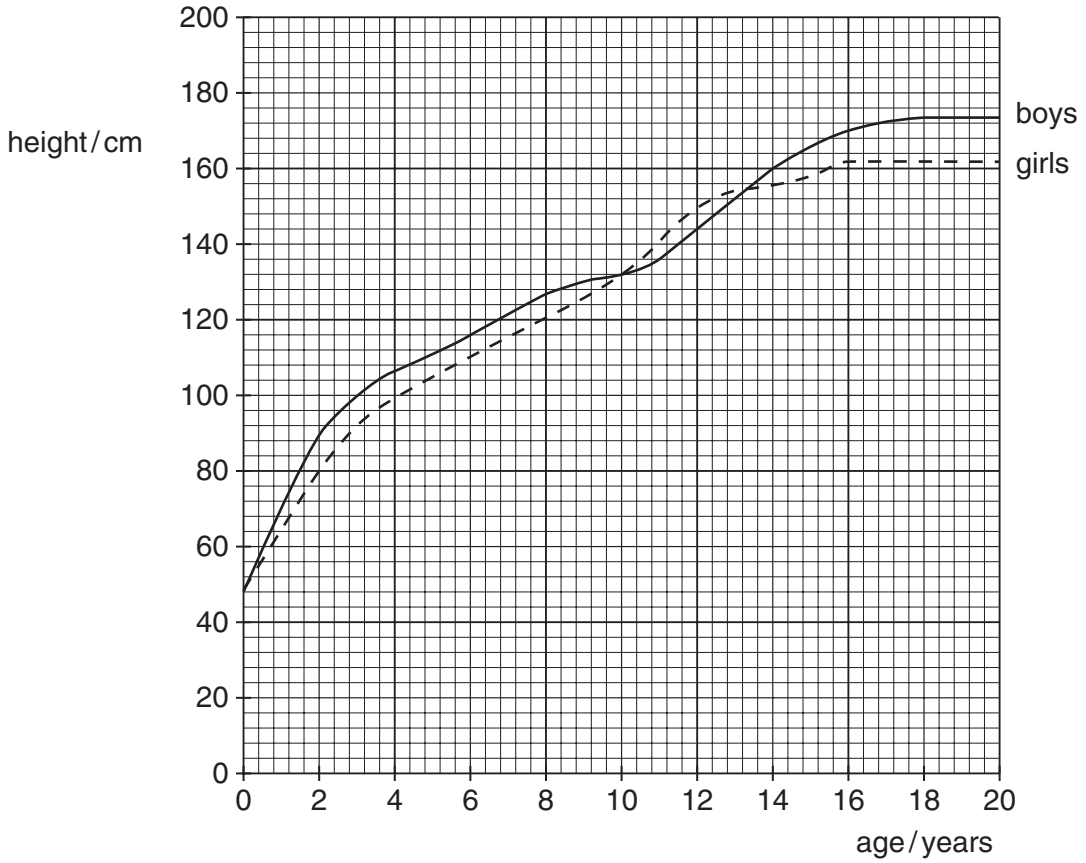

Fig. 1.1

(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.

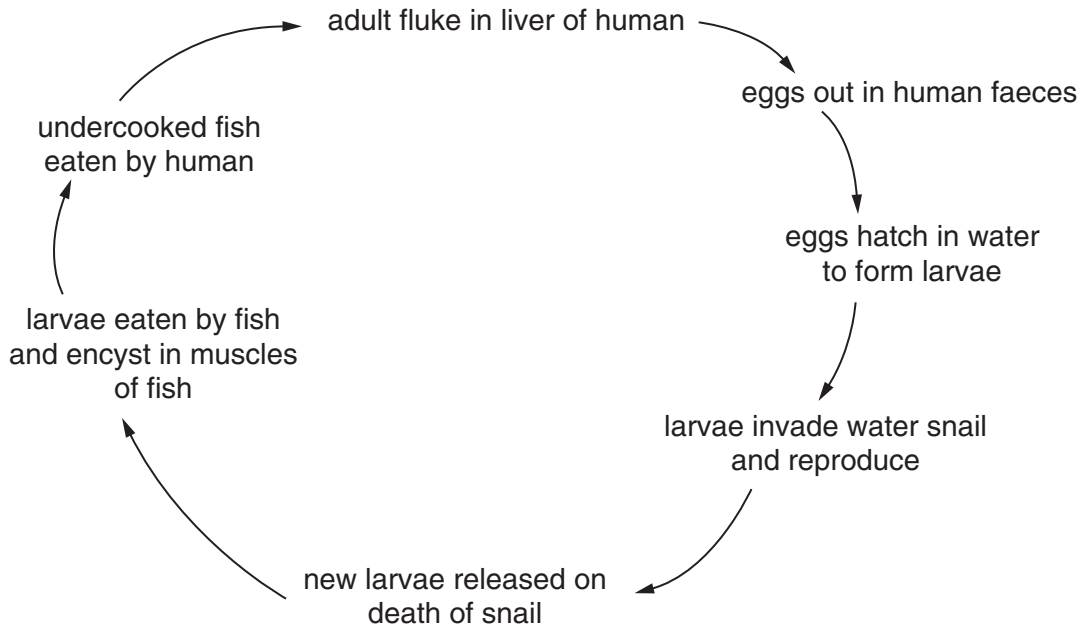

Fig. 2.1

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

1. .....

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.

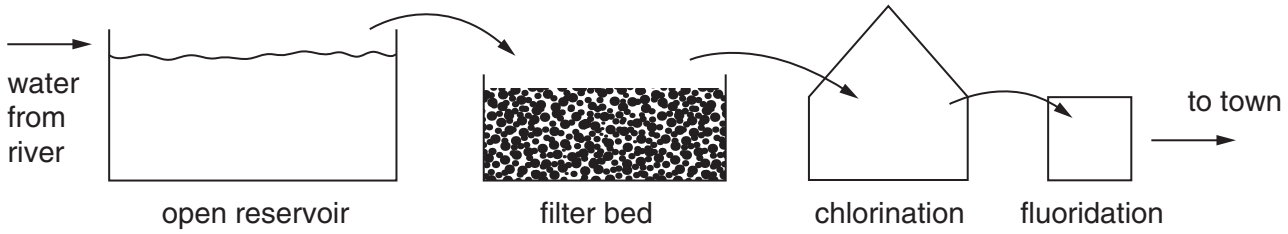

Fig. 3.1

(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]

[Turn over

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

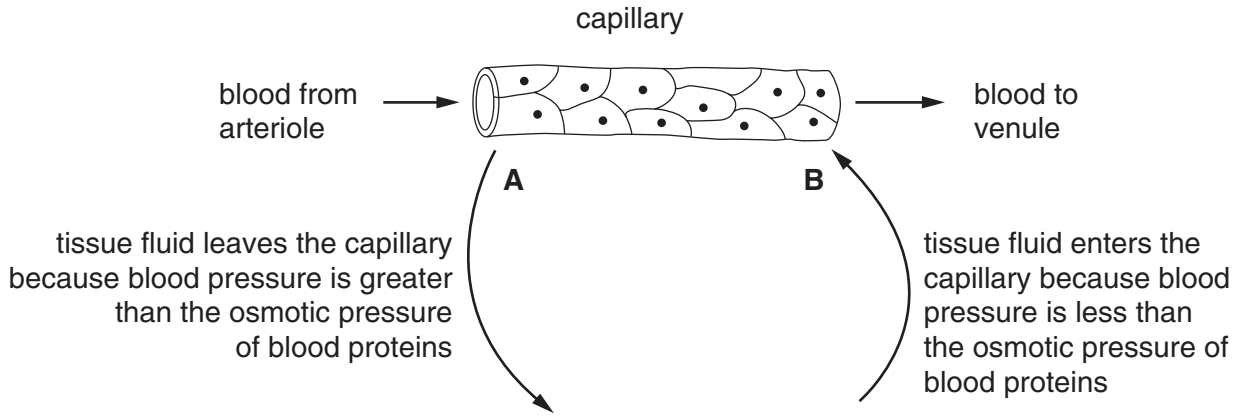

Fig. 4.1

(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]

[Turn over

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]

[Turn over

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.

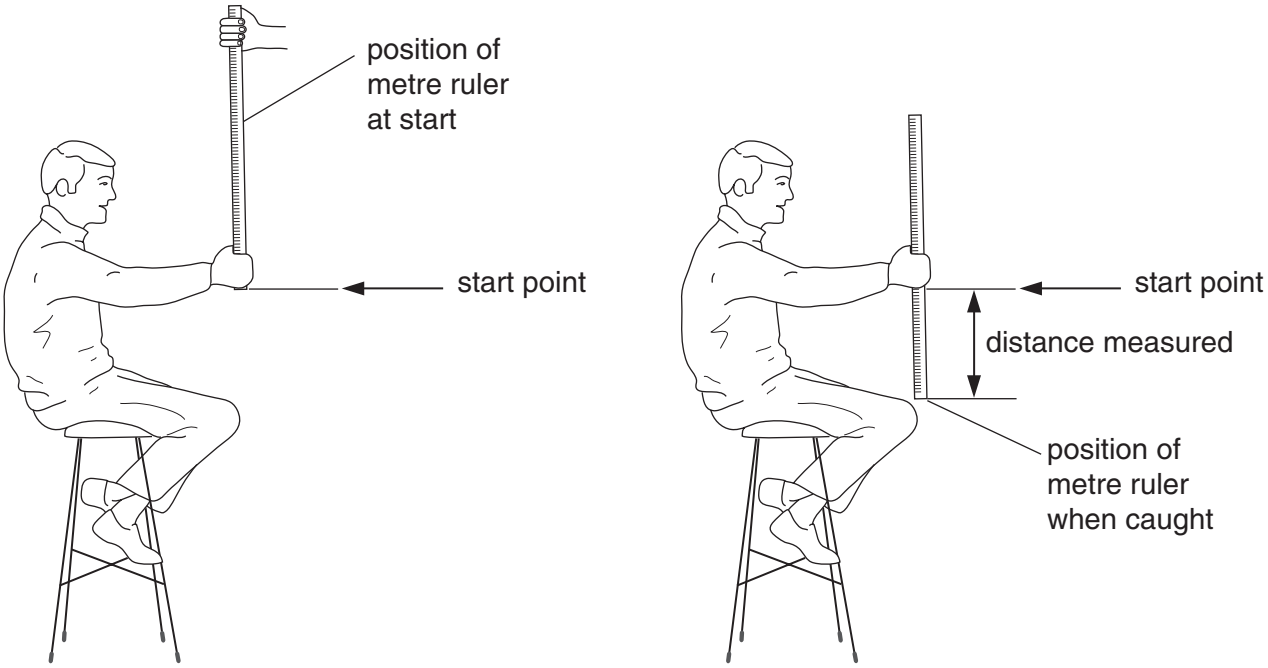

Fig. 10.1

(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]