



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE
NAME

CENTRE
NUMBER

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CANDIDATE
NUMBER

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HUMAN AND SOCIAL BIOLOGY

5096/02

Paper 2

October/November 2009

2 hours

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, graphs or rough working.

Do not use staples, paper clips, highlighters, glue or correction fluid.

DO **NOT** WRITE IN ANY BARCODES.

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 in the spaces provided on the Question Paper.

Write an **E** (for Either) or an **O** (for Or) next to the number 10 in the Examiner's grid to indicate which question you have answered.

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

For Examiner's Use	
1	
2	
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4	
5	
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7	
Section A sub-total	
8	
9	
10	
Total	

This document consists of **19** printed pages and **1** blank page.



Section A

Answer **all** the questions.

Write your answers in the spaces provided.

1 Fig. 1.1 shows a view of the heart from the front.

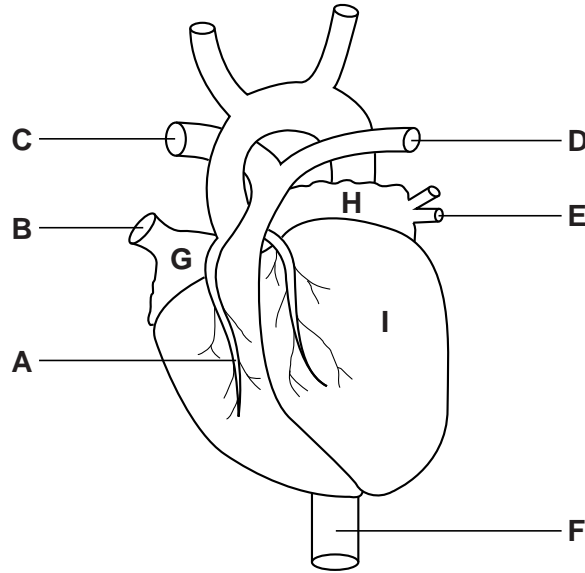


Fig. 1.1

(a) Using only the letters **A** to **F**, list which of the blood vessels on Fig. 1.1

(i) carry deoxygenated blood, [3]

(ii) carry oxygenated blood. [3]

(b) Name the heart chambers indicated by the letters **G**, **H** and **I** on Fig. 1.1.

G

H

I [3]

(c) State in which of the vessels **A** to **F** a blockage commonly leads to heart failure.

..... [1]



Blood leaves the heart under high pressure through arteries and re-enters it through veins under low pressure.

(d) List three ways in which the **structure** of arteries is adapted to withstand high pressure.

1.
2.
3. [3]

(e) When a doctor takes your blood pressure, two readings are given, for example, 120 over 80 millimetres of mercury. Explain what the two figures represent in this example.

.....

 [2]

Table 1.2 shows the percentage blood flow to different tissues and organs when the body is at rest and then during heavy exercise.

Table 1.2

organs	blood flow at rest/%	blood flow during exercise/%
heart	4	4
skin	9	2
brain	13	3
kidneys	19	1
gut	24	1
muscles	22	88
other organs	9	1
total	100	100

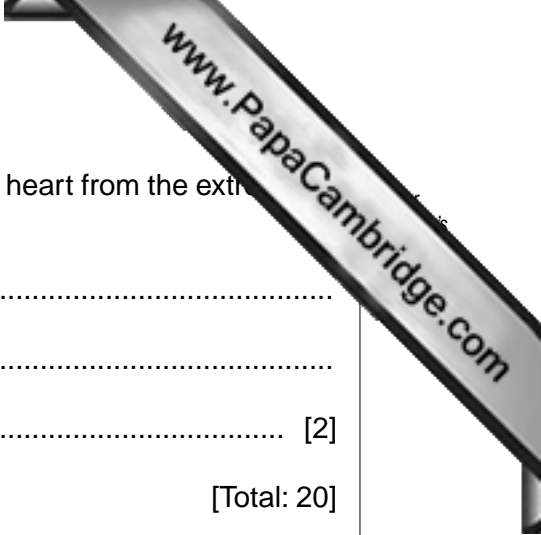
(f) Using the information in Table 1.2,

(i) state which two organs show the greatest reduction in percentage blood flow during exercise,

1.
2. [2]

(ii) calculate by how many times blood flow to the muscles increases during exercise.

..... [1]



(g) Describe how muscular activity helps in returning blood to the heart from the extremities of the body.

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..... [2]

[Total: 20]

- 2 Fig. 2.1 shows an experiment to demonstrate the digestion of starch to sugar by an enzyme in saliva.

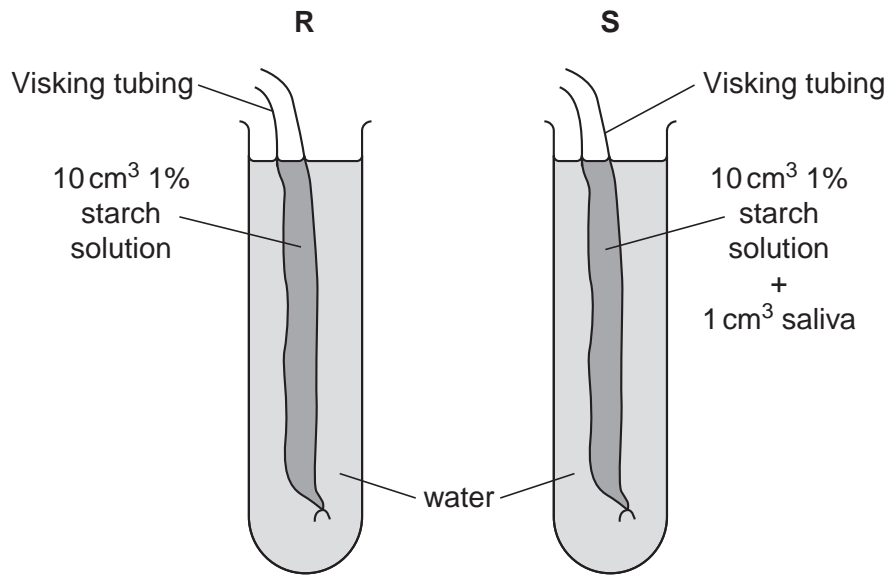


Fig. 2.1

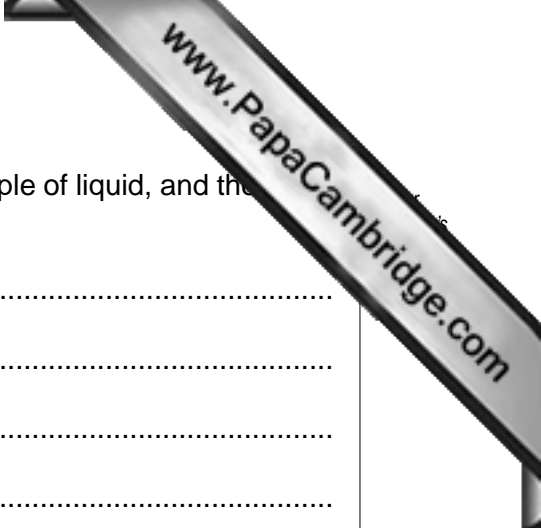
Visking tubing resembles the gut wall in that it is permeable to small molecules but not to large ones. Tests for starch and sugar were carried out on samples of the fluid taken from inside the Visking tubing and the water outside, at the start of the experiment and after 20 minutes. Some of these results are shown in Table 2.1 below.

- (a) Complete Table 2.1 by using the words *present* or *absent*.

[4]

Table 2.1

liquid tested	result at start		result after 20 minutes	
	starch	sugar	starch	sugar
fluid in R	present	absent	present	absent
water in R	absent	absent	absent	absent
fluid in S	present	absent		
water in S	absent	absent		



(b) Describe how you would carry out the test for sugar on a sample of liquid, and the results you would see if sugar was present.

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..... [4]

[Total: 8]

3 Fig. 3.1 shows a section through the skin under two different conditions, **P** and **Q**. In **P** the body is at rest; in **Q** the body is exercising hard.

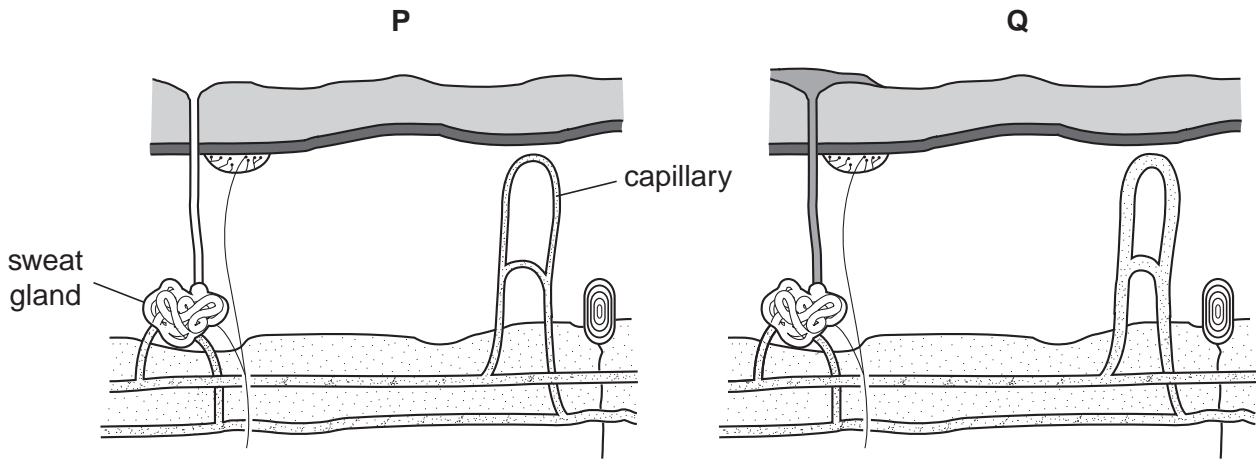


Fig. 3.1

(a) State two ways in which the skin shown in **Q** differs from **P**.

1. [2]
2. [2]

(b) Explain how each of the differences you stated in (a) will increase heat loss from the skin.

1. [4]
2. [4]

[Total: 6]

- 4 Fig. 4.1 shows the bones and related tissues of the elbow joint.

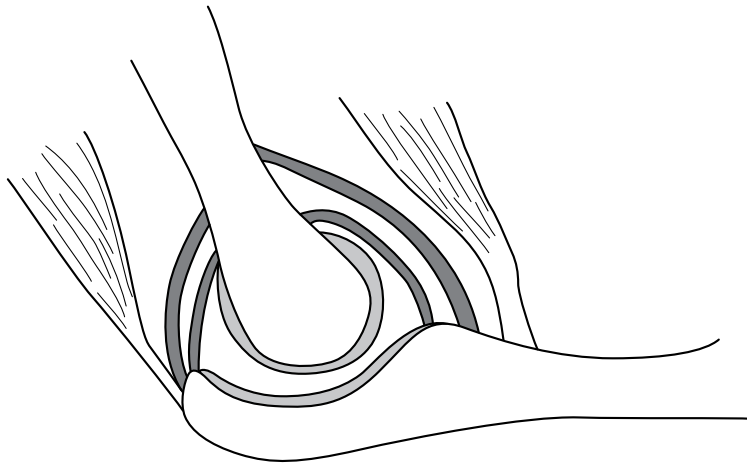


Fig. 4.1

- (a)** Label an example of each of the following tissues on Fig. 4.1.

- (i)** cartilage
- (ii)** ligament
- (iii)** tendon
- (iv)** muscle

[4]

- (b)** State two advantages of bone being a living tissue.

1.
2. [2]

[Total: 6]

5 Fig. 5.1 shows a vertical section through the female reproductive organs.

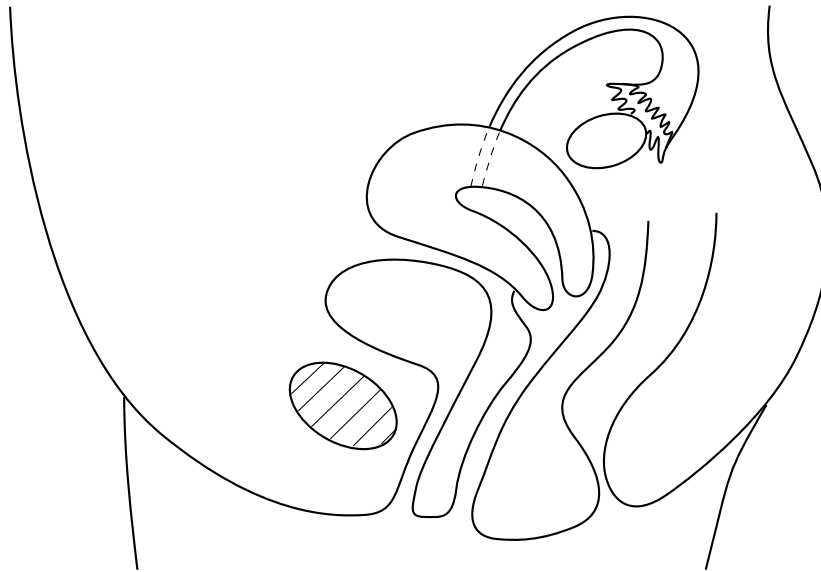


Fig. 5.1

Using label lines and the letters **J** to **N** show the following on Fig. 5.1:

- J** – where meiosis occurs
- K** – a ciliated region
- L** – urethra
- M** – where implantation occurs
- N** – where oestrogen is formed

[5]

[Total: 5]

- 6 Read the following paragraph and choose from the terms given below to fill in the blanks in the passage.

active *antibodies* *antigens* *long* *lymphocytes*
passive *phagocytes* *plasma* *serum* *short*

Poisonous snakes can be farmed for their venom. This is collected and a diluted sample is injected into a large animal such as a horse. The horse's make to the toxin in the venom. Later, larger doses of venom are injected into the horse which responds by forming large numbers of these protective proteins. Blood can be taken from the horse and its corpuscles removed. The resulting liquid, rich in proteins, is called a If a person is bitten by the same species of snake, the horse-extract can be used to treat that person. This protection is a type of immunity. The protection given is immediate, but is of duration.

[5]

[Total: 5]

7 Fig. 7.1 shows the distribution of rods and cones across the retina of the eye from one edge to the other.

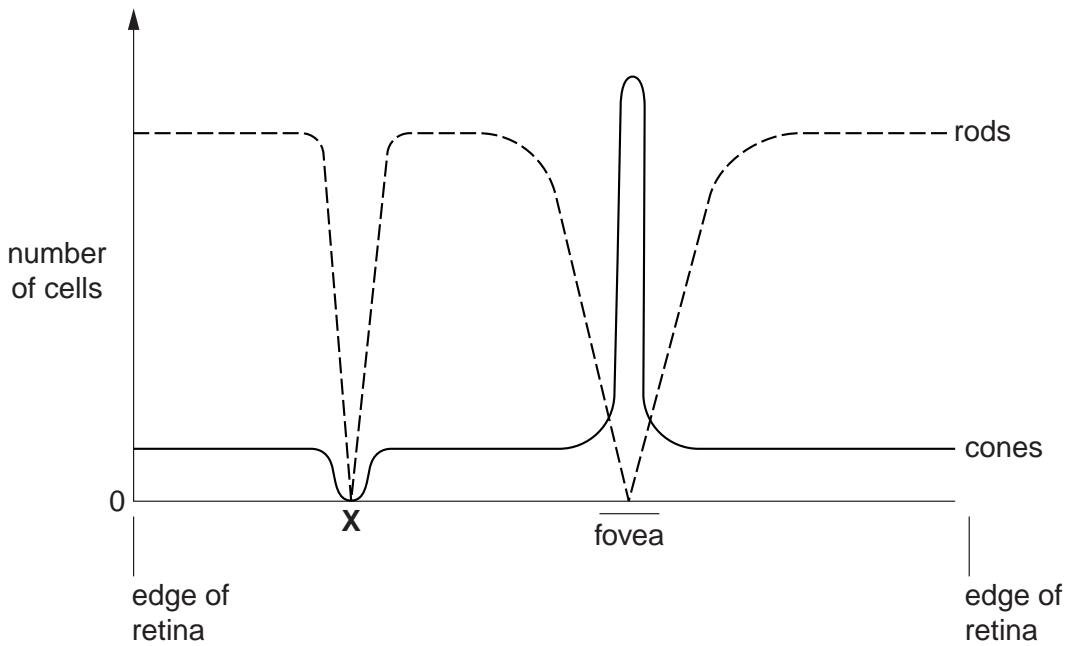
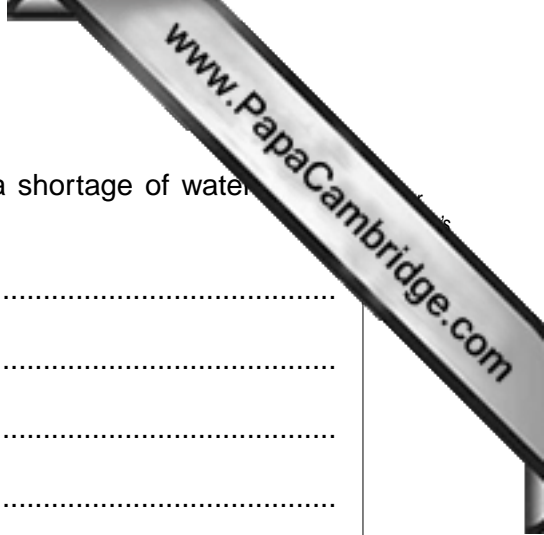


Fig. 7.1

- (a) In which part of the retina are
 - (i) the most rods found,
 - (ii) the most cones found? [2]
- (b) Identify region X on Fig. 7.1. [1]
- (c) State which region of the eye contracts
 - (i) to reduce the amount of light entering the eye,
 - (ii) to focus on a near object. [2]

[Total: 5]



(c) Describe how the brain and kidney interact when there is a shortage of water in the blood.

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..... [4]

[Total: 15]

(c) Alcohol is said to be addictive. Explain what this means.

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..... [2]

Fig. 10.1 shows simple apparatus which an experimenter could use to measure the speed of a subject's reactions.

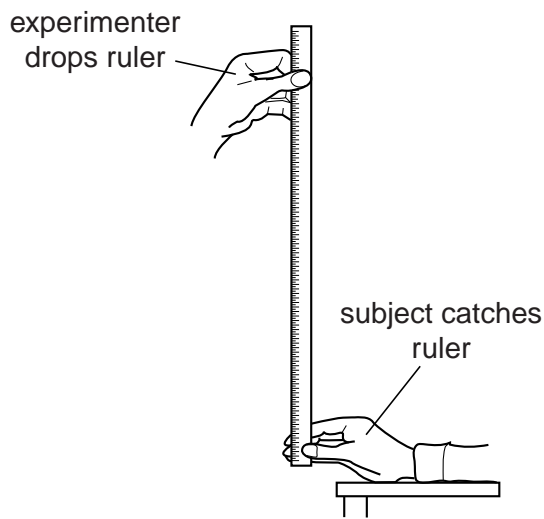


Fig. 10.1

(d) Describe how this apparatus could be used to measure the effect of drinking alcohol on the subject.

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..... [4]

[Total: 15]

(c) What is meant by the term *vital capacity*?

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..... [2]

Fig. 10.2 shows some apparatus.

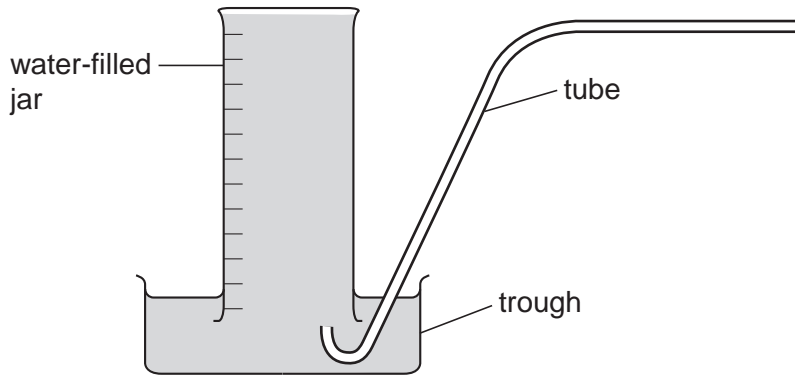


Fig. 10.2

(d) Describe how you would use this apparatus to measure the effect of prolonged smoking on vital capacity.

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..... [4]

[Total: 15]

