



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE
NAME

CENTRE
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HUMAN AND SOCIAL BIOLOGY

5096/22

Paper 2

October/November 2011

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.

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

DO NOT WRITE IN ANY BARCODES.

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

Section A

Answer **all** questions.

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

Section B

Answer **both** the questions.

Section C

Answer **either** question **10** or question **11**.

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	
7	
Section A sub-total	
8	
9	
Section C	
10	11
Total	

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



Section A

Answer **all** the questions in this section.

Write your answers in the spaces provided.

1 Fig. 1.1 shows the three blood vessels connected to the liver.

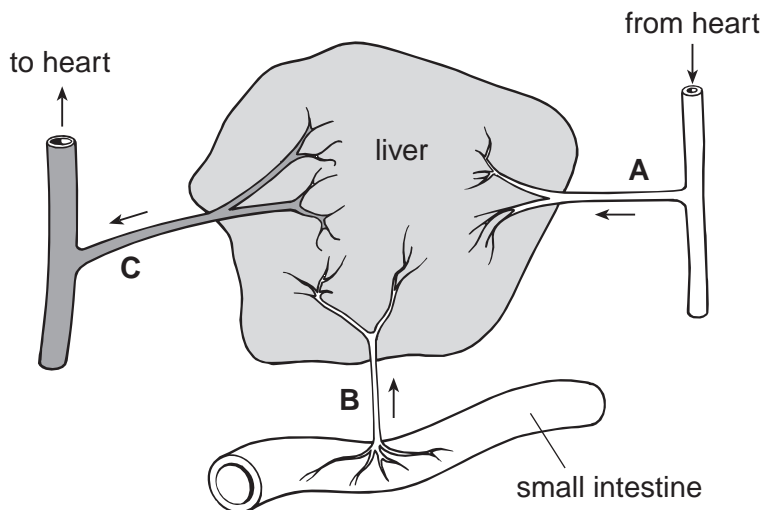


Fig. 1.1

(a) Name **A**, **B** and **C**.

A

B

C [3]

(b) Suggest **one** substance transported into the liver by each of the blood vessels **A** and **B**.

A

B [2]

- (c) A student prepared a microscope slide by squashing some liver between a slide and a coverslip, as shown in Fig. 1.2.

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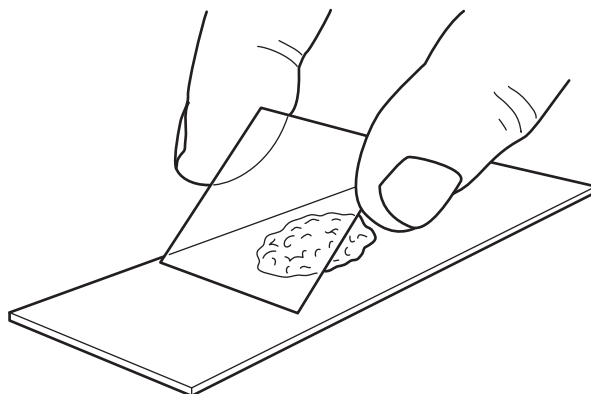


Fig. 1.2

Suggest **two** reasons why a coverslip should be used.

.....

.....

.....

..... [2]

Fig. 1.3 is a drawing of a cell seen by the student using the microscope.

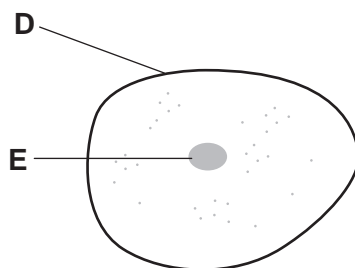


Fig. 1.3

- (d) Name structures **D** and **E**.

D

E [2]

In addition to these structures, liver cells contain large numbers of mitochondria.

- (e) Name the process that takes place in mitochondria.

..... [1]

Fig. 1.4 shows the liver and some other organs.

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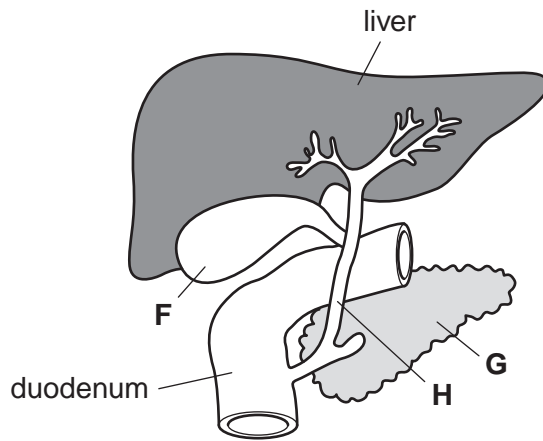


Fig. 1.4

(f) Name structures **F**, **G** and **H**.

F.....

G.....

H..... [3]

(g) Using information in Fig. 1.4, explain how fats are digested in the duodenum.

.....
.....
.....
.....
.....
.....
.....
.....
.....
..... [4]

Fig. 1.5 shows the mechanism by which the body controls the glucose concentration in the blood.

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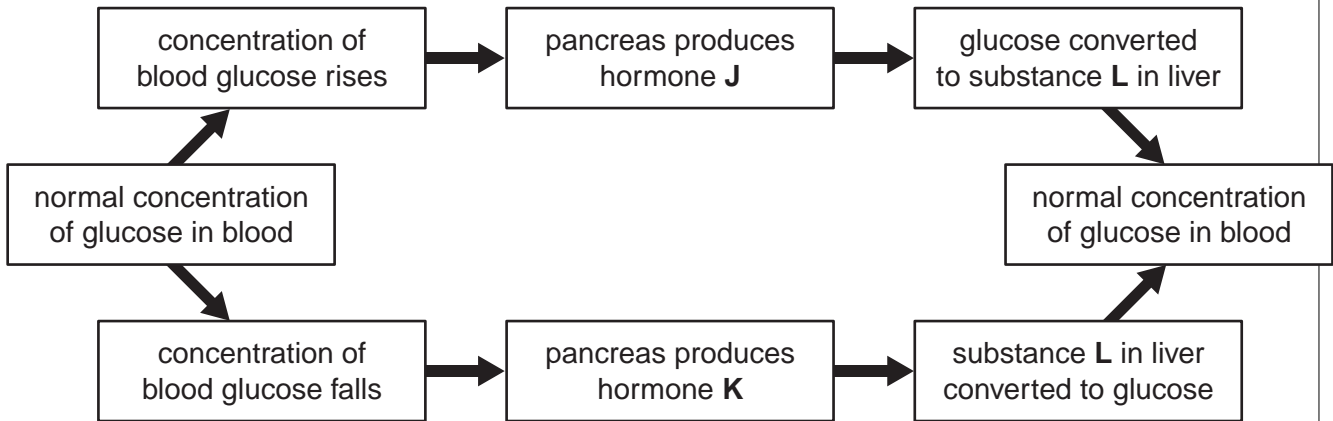


Fig. 1.5

(h) Name the hormones **J** and **K**, and substance **L**.

J =

K =

L = [3]

[Total: 20]

2 Fig. 2.1 shows front views of an eye.

Fig. 2.1(a) shows the eye before it is subjected to a stimulus. Fig. 2.1(b) shows the response of the iris to the stimulus.

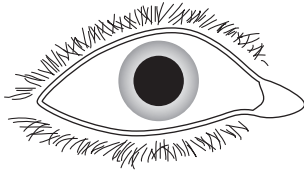


Fig. 2.1(a)

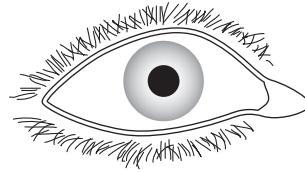


Fig. 2.1(b)

(a) (i) State the stimulus that causes the iris to respond in the way shown in Fig. 2.1(b).
.....[1]

(ii) This response happens automatically, without the need for thought.
State the name given to this sort of automatic response.
.....[1]

(iii) State the advantage of this response.
.....
.....[1]

(b) The ciliary body in the eye has circular muscles that surround the lens.
State the function of these circular muscles.
.....
.....
.....
.....[2]

(c) The wall of the alimentary canal contains circular muscles.
State the function of the circular muscles in the wall of the alimentary canal.
.....
.....
.....
.....[2]

[Total: 7]

3 The volume of urine produced can be affected by a number of factors, such as the surrounding air temperature, cholera and a rare condition known as *diabetes insipidus*.

(a) Explain why a smaller volume of urine is produced as the temperature of the surroundings increases.

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

(b) Explain why a person infected with cholera produces a much smaller volume of urine than normal.

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

People with *diabetes insipidus* produce much less antidiuretic hormone (ADH) than normal people.

(c) Explain how this results in a much greater volume of urine being produced.

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

[Total: 7]

4 Fig. 4.1 shows the life cycle of the blood fluke *Schistosoma mansoni*.

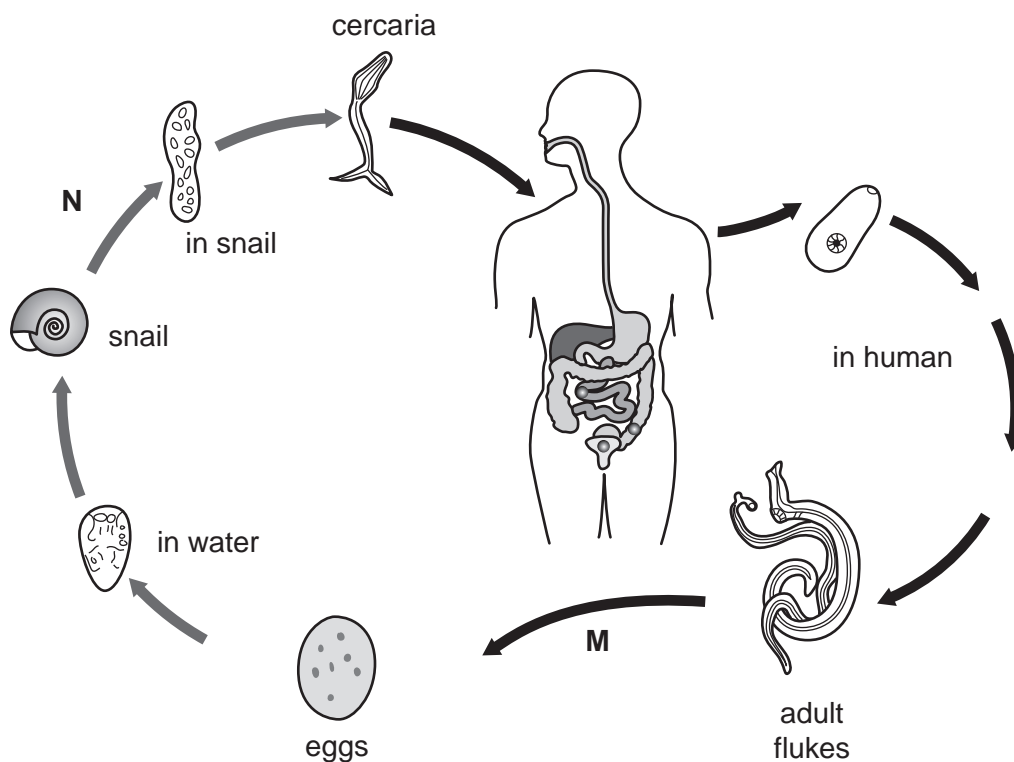


Fig. 4.1

(a) *Schistosoma mansoni* is a parasite. Explain what is meant by the term *parasite*.

.....

 [2]

(b) State the role of the snail in the life cycle of *Schistosoma*.

..... [1]

(c) State the type of reproduction that takes place at **M** and at **N** in Fig. 4.1.

M

N [2]

(d) State the role in the life cycle of each of the following stages.

cercaria..... [1]

adult flukes..... [1]

[Total: 7]

5 Some dilute sucrose solution, **P** was put into a length of Visking (dialysis) tubing which was knotted securely at both ends. The tubing was put into another sucrose solution, **Q**, and left for five hours. Fig. 5.1 shows the appearance of the tubing at the beginning and after five hours.

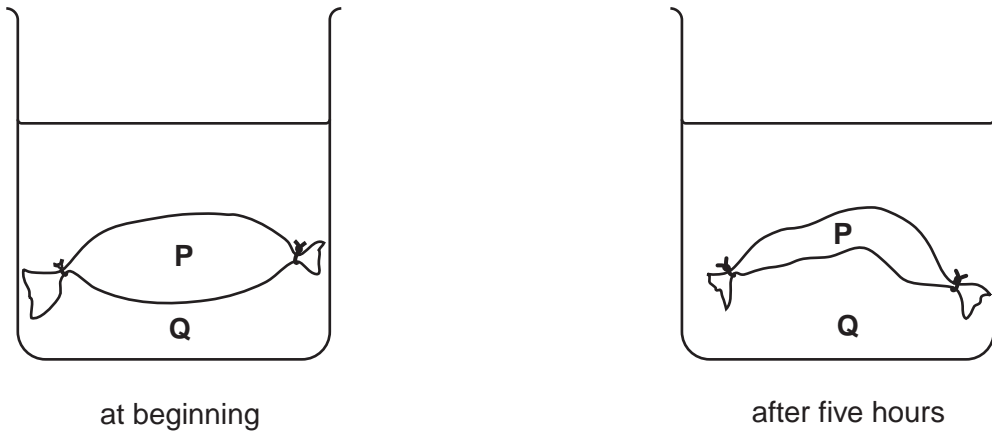


Fig. 5.1

(a) Suggest what has caused the change in appearance of the tubing.

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

(b) What can you deduce about the concentration of solution **Q**?

Explain your answer.

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

[Total: 4]

- 6 Six students carried out an experiment to investigate vital capacity, using the apparatus shown in Fig. 6.1. The calibrated bottle full of water was inverted in a trough of water and a rubber tube was placed into it. A student took a deep breath and exhaled through the tube so that the air collected in the bottle. The volume of air collected in the bottle is the vital capacity.

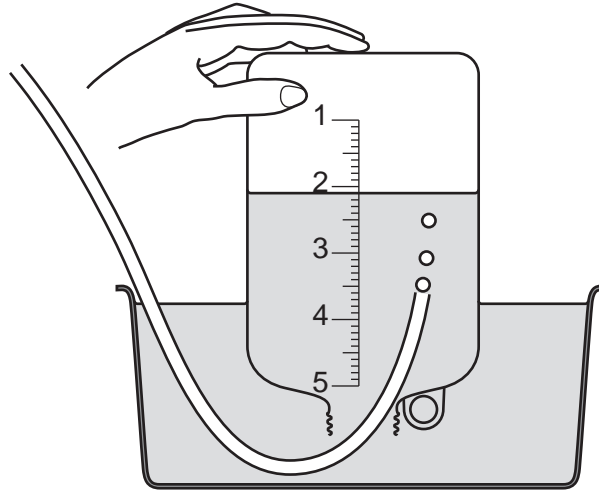


Fig. 6.1

The students also weighed themselves. Table 6.1 shows their results.

Table 6.1

student	sex	vital capacity /dm ³	body mass /kg
1	male	2.1	31.8
2	male	2.2	34.1
3	male	2.4	42.2
4	female	1.8	26.3
5	female	2.2	35.9
6	female	2.4	49.4

Fig. 6.2 shows the results for students 1 to 3 in the class.

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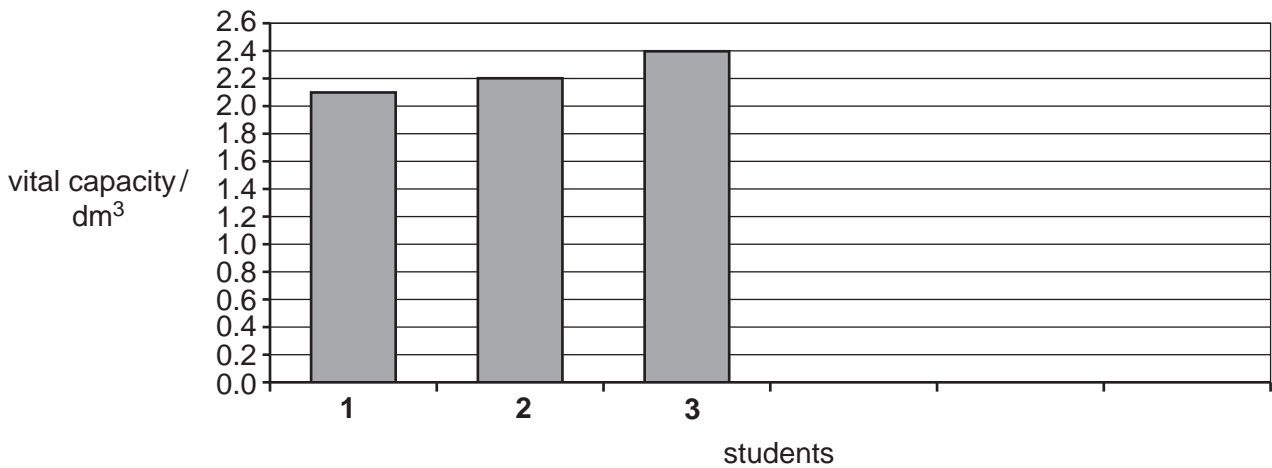


Fig. 6.2

(a) Complete Fig. 6.2 by plotting the vital capacity of the other students. [2]

(b) With reference to the results, what can you conclude about the relationship between body mass and vital capacity?

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

(c) What can you conclude by comparing the results for the vital capacities and body masses of the males with the vital capacities and body masses of the females?

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

(d) State a factor, other than body mass, that can influence the vital capacity.
..... [1]

[Total: 6]

7 Fig. 7.1 shows two different types of nuclear division.

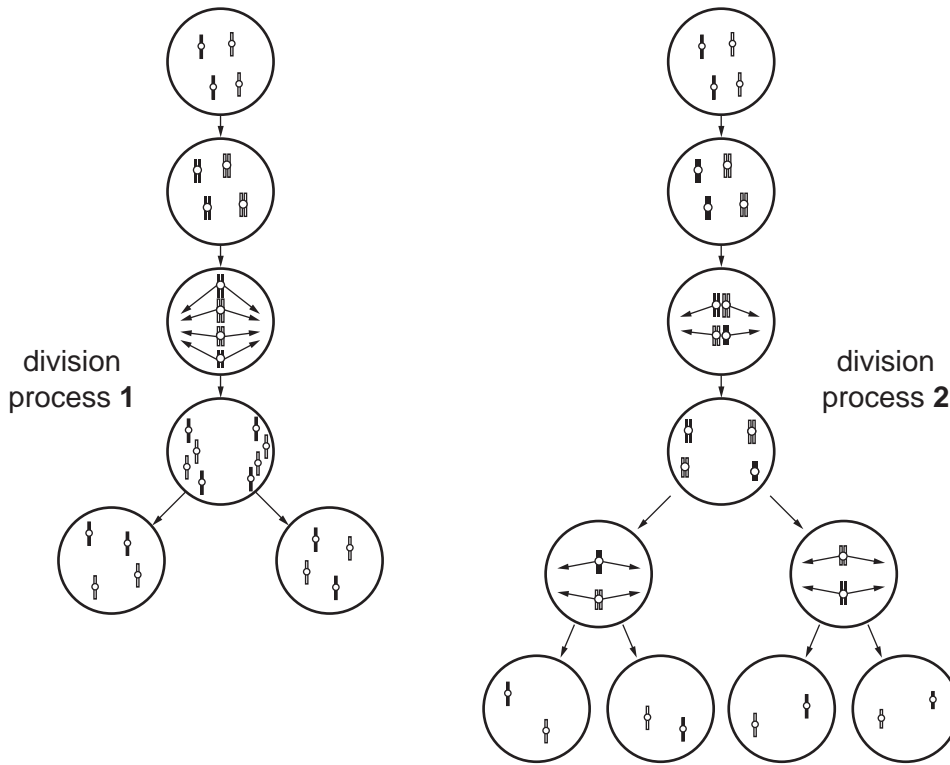


Fig. 7.1

(a) Which of these processes represents mitosis?

..... [1]

(b) One of the places where division process 1 takes place is in bones.

Suggest **two** different reasons why this is so.

1.

.....

2.

..... [2]

(c) Name an organ of the body in which division process 2 takes place.

..... [1]

[Total: 4]

Section B

Answer both questions in this section.

Write your answers in the spaces provided.

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8 Carbohydrates, proteins and fats are macronutrients as they are required in the diet in relatively large quantities.

(a) For each group of macronutrients, complete Table 8.1 by naming

- (i) a possible food source, [3]
- (ii) a main use in the body, [3]
- (iii) a product of their digestion, [3]
- (iv) an enzyme that acts on them. [3]

Table 8.1

	macronutrient group		
	carbohydrates	proteins	fats
(i) possible food source			
(ii) main use in the body			
(iii) product of digestion			
(iv) enzyme that acts			

(b) Explain why enzymes are needed to digest these macronutrients.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 15]

9 (a) Explain the difference between heat and temperature.

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

(b) State the normal value for human body temperature.

..... [1]

Body temperature changes according to various factors.

(c) State **three** reasons why body temperature may increase.

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

The temperature of the body is normally kept fairly constant by balancing heat production and heat loss.

(d) Explain how the body produces heat when in a cold environment.

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

(e) Describe **two** ways in which the body removes excess heat.

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1.
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2.
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[7]

[Total: 15]

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