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UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

2684611977

HUMAN AND SOCIAL BIOLOGY **5096/02**

Paper 2 **October/November 2008**

2 hours

Candidates answer on the Question Paper

Additional Materials: Answer Booklet/Paper

READ THESE INSTRUCTIONS FIRST

If you have been given an Answer Booklet, follow the instructions on the front cover of the Booklet.
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.

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.
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.

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	
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4	
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6	
7	
Section A sub-total	
8	
9	
10	
Total	

This document consists of **15** printed pages and **1** blank page.

UNIVERSITY of CAMBRIDGE International Examinations

Section A

For Examiner's Use

Answer **all** the questions.

Write your answers in the spaces provided.

1 Four different foods, **A**, **B**, **C** and **D,** were crushed up and each mixed with water. Samples of these were tested for the presence of different nutrients with the results as shown in Table 1.1.

Table 1.1

food	iodine solution added	rubbed onto paper and dried	biuret solution added	boiled with Benedict's solution
A	brown colour	clear spot	blue solution	blue solution
B	blue-black	no clear spot	blue solution	blue solution
C	brown colour	no clear spot	purple colour	brown precipitate
D	brown colour	no clear spot	blue colour	red precipitate

(a) Which of the foods **A**, **B**, **C** and **D** contained

(i) fat/lipid, ...

(ii) protein, ...

(iii) starch, ...

(iv) sugar. ..... [5]

(b) Fig. 1.1 shows the human gut.

For Examiner's Use

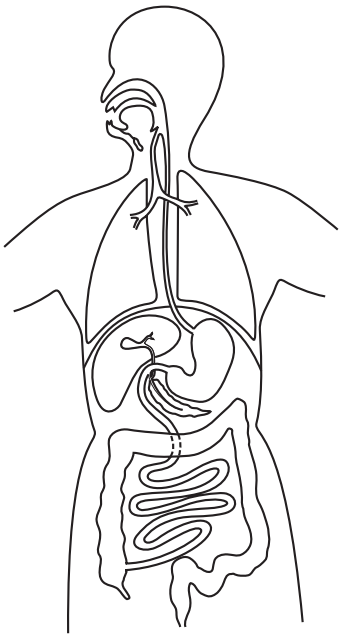

Fig. 1.1

(i) Use label-lines and the letters **F**, **P** and **S** to show on Fig. 1.1 where the following are **first** acted on by digestive enzymes.

F - fats
P - proteins
S - starch [3]

(ii) Different pH conditions occur in different parts of the digestive system.
Fill in Table 1.2 to show where the following pH values are found.

Table 1.2

pH value	region of gut
2	
7	
9	

[3]

Fig. 1.2 shows a section through part of the wall of the ileum.

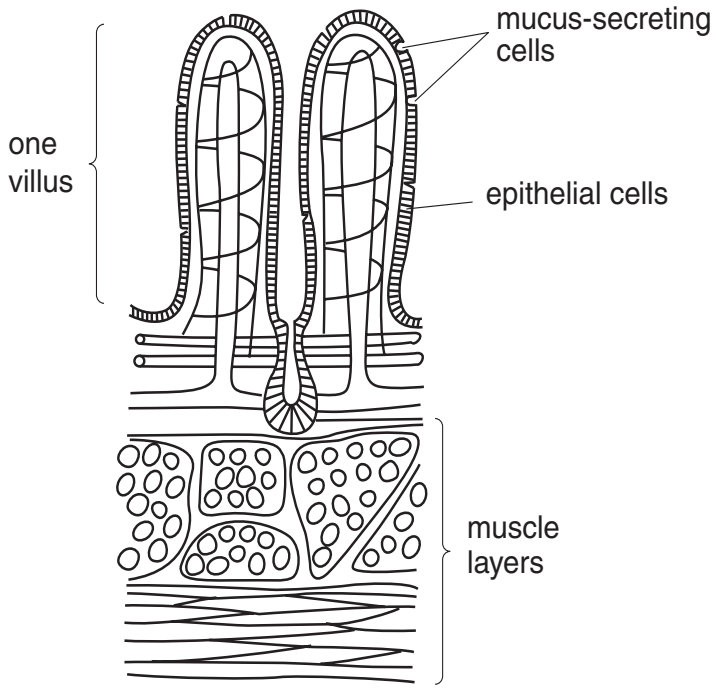

Fig. 1.2

(c) State how each of the following features adapts the wall of the ileum for digestion and/or absorption.

villus .....

muscle layers .....

mucus .....[3]

(d) If the epithelial cells of the villus are viewed under a microscope, their cytoplasm is seen to contain many mitochondria.

State how mitochondria might assist in the absorption of nutrients from the ileum.

.....

.....[2]

(e) One secretion entering the gut is bile.

State where bile is **(i)** made, ...

(ii) stored. .....[2]

(f) State the effect of bile on

For Examiner's Use

(i) fats, ...

(ii) peristalsis. .....

[2]

[Total: 20]

2 Fig. 2.1 shows a vertical section through the heart and its major vessels seen from the front.

For Examiner's Use

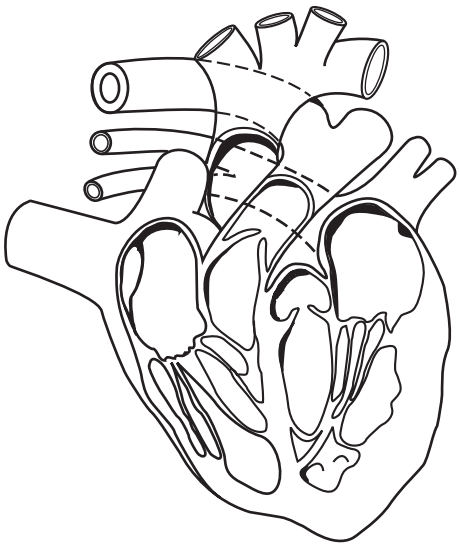

Fig. 2.1

(a) By means of label-lines and letters written on Fig. 2.1, identify the following.
G - a chamber pumping blood to the lungs,
H - a chamber receiving blood from the lungs,
J - a vein carrying deoxygenated blood,
K - a vein carrying oxygenated blood. [4]

(b) The left ventricle generates four times the pressure of the right ventricle. State what evidence you can see in Fig. 2.1 to support this statement.

.....

.....[1]

[Total: 5]

3 Fig. 3.1 shows changes in the thickness of the uterus lining as well as changes in progesterone concentration during a menstrual cycle.

For Examiner's Use

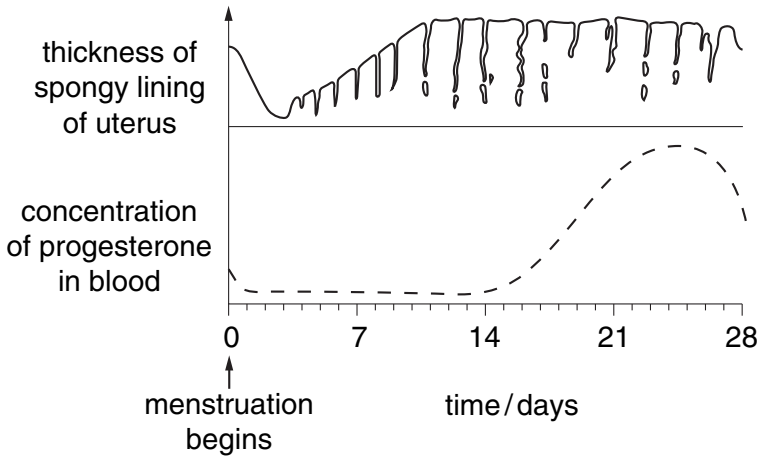

Fig. 3.1

(a) State at what time in the cycle

(i) the lining first shows signs of repair ..... days,

(ii) the concentration of progesterone begins to rise ..... days,

(iii) the lining reaches maximum thickness ..... days. [3]

(b) (i) Name the organ that produces progesterone. .....

(ii) How does progesterone reach its target? ..... [2]

(c) Name the hormone that is predominant in the first two weeks of the cycle.

.....[1]

For Examiner's Use

(d) Increases in mass of different regions of a pregnant woman's body were measured during the pregnancy.
Fig. 3.2 shows a bar chart of mass increases recorded at the end of pregnancy.

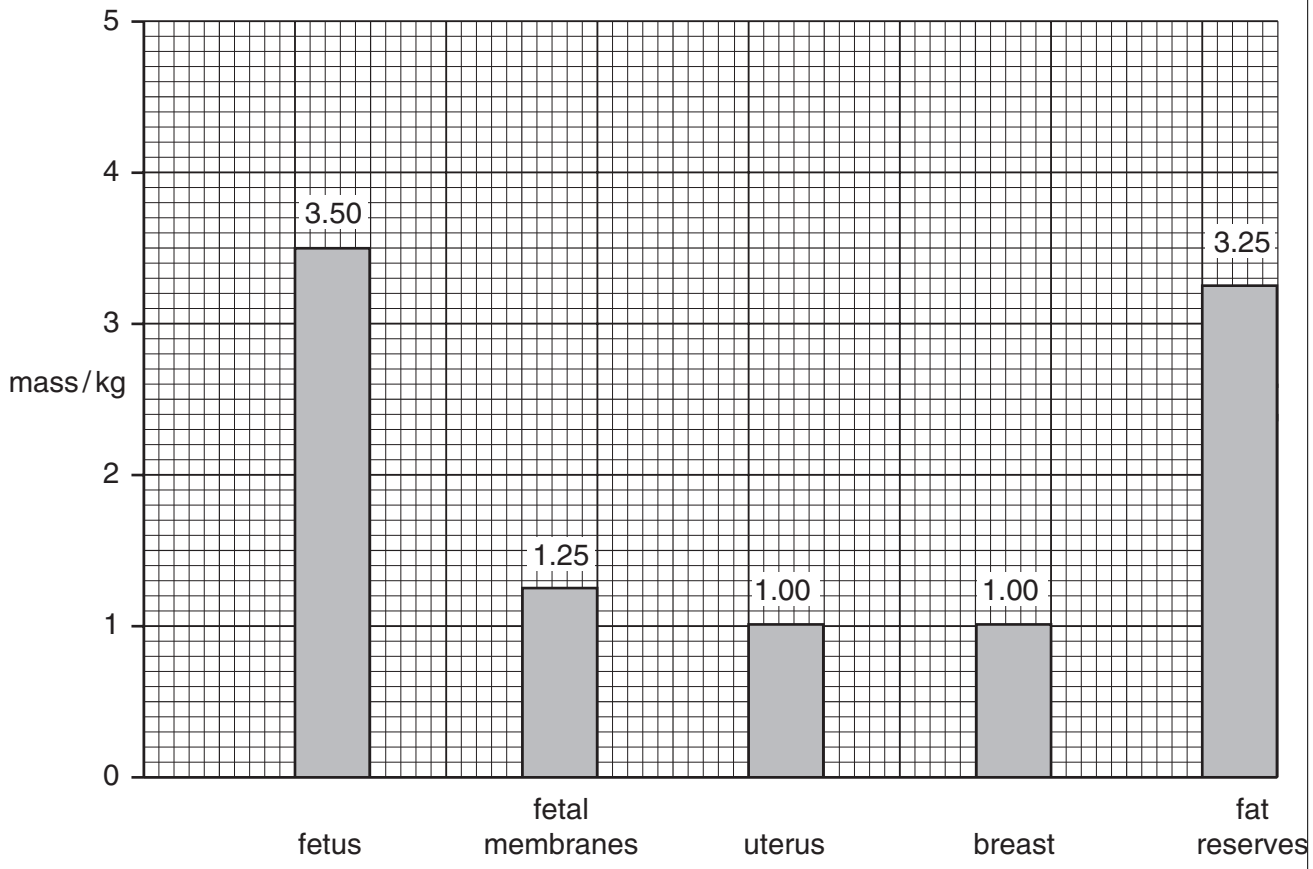

Fig. 3.2

(i) Calculate the total mass increase during the pregnancy.

= ..... kg [1]

(ii) What **percentage increase** is due to fetal tissues? Show your working.

.....

.....

= ..... % [3]

[Total: 10]

4 Diseases may be transmissible, caused by infectious organisms, or non-transmissible due to inherited or environmental conditions.

For Examiner's Use

Complete Table 4.1 by naming examples of the diseases described.

Table 4.1

type of disease	cause	name
non-transmissible	inherited	
transmissible	fungus contact	
transmissible	protozoan	
non-transmissible	nutritional deficiency	
transmissible	virus via semen	

[Total: 5]

5 Albinism is an inherited condition.

For Examiner's Use

Human skin pigment is controlled by a gene with two alleles.

Allele **N** gives rise to normal pigmentation.
Allele **n** is no pigment (albinism).

Fig. 5.1 shows the inheritance of albinism in two linked families. The individuals have been numbered for ease of reference.

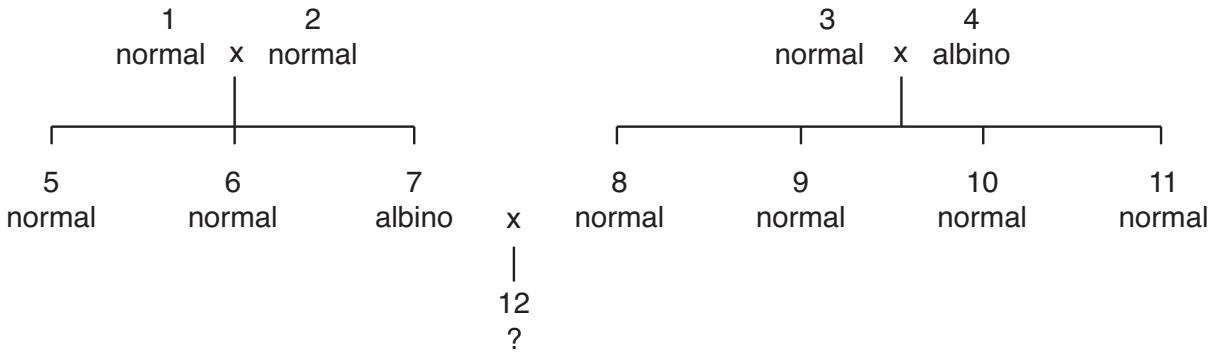

Fig. 5.1

(a) Write down the genotypes of the following individuals.

Individual 2 .....

Individual 3 .....

Individual 4 .....

Individual 8 ..... [4]

(b) What is the chance that 12 is **(i)** an albino, ...

(ii) an albino boy?..... [2]

[Total: 6]

6 Fig. 6.1 shows a horizontal section through the eye.

For Examiner's Use

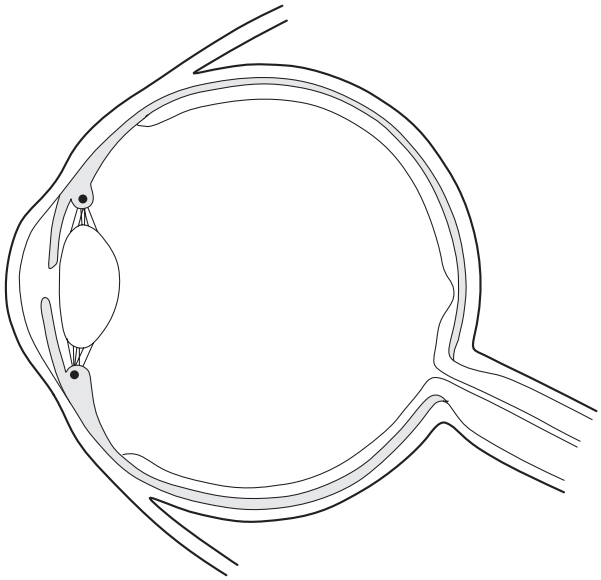

Fig. 6.1

(a) Using the letters **P**, **Q** and **R**, label on Fig. 6.1 the following regions of the retina.

(i) **P** - we use this when reading in bright light.

(ii) **Q** - we use this in very dim light.

(iii) **R** - this has no photoreceptors. [3]

(b) Use a label line and the letter **M** to label a muscular region that controls the amount of light entering the eye. [1]

[Total: 4]

7 Fig. 7.1 shows the recycling of carbon in nature.

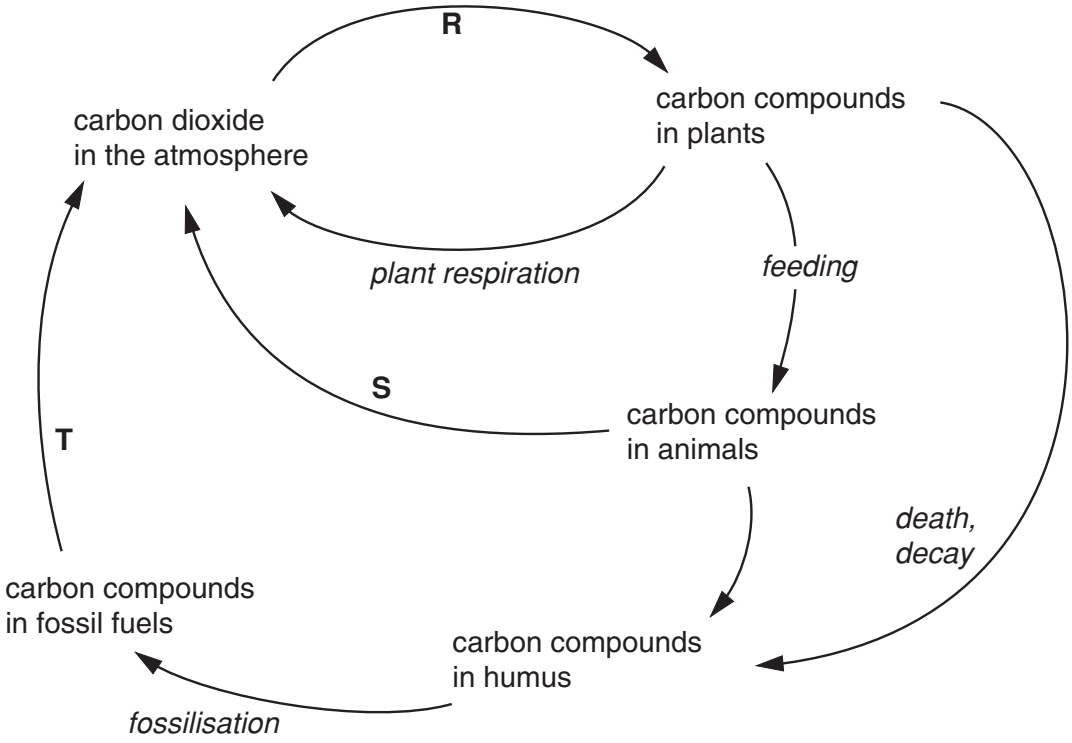

Fig. 7.1

(a) Using terms **only** from the list below, identify the processes labelled **R**, **S** and **T**.

animal respiration; burning of fuels; leaching; photosynthesis. [3]

R .....

S .....

T .....

(b) The concentration of carbon dioxide in the atmosphere is rising. 'Slash and burn' clearance of tropical forest is thought to be partly to blame. Give two reasons why this may be the case.

1. .....

2. .....[2]

[Total: 5]

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 **(a)** In human reproduction fertilisation and implantation occur. Describe what is meant by the terms *fertilisation* and *implantation.* [6]

(b) Describe fully the pathway taken by oxygen from the mother's lungs to the fetal tissues. [6]

(c) Some mothers smoke during pregnancy. Explain how smoking may reduce the supply of oxygen to the fetus. [3]

9 **(a)** Describe and explain the changes that take place in the skin to prevent our bodies from overheating. [6]

(b) Explain the following.

(i) We can continue to lose heat even when the air temperature is above 40 °C.

(ii) Hot and humid conditions are less comfortable than hot and dry ones.

(iii) Babies may need a blanket when adults do not.

(iv) Sportsmen playing in the sun for several hours now coat exposed areas of their skin with protective sun creams. [9]

10 Either

Fig. 10.1 shows the life cycle of the malaria parasite.

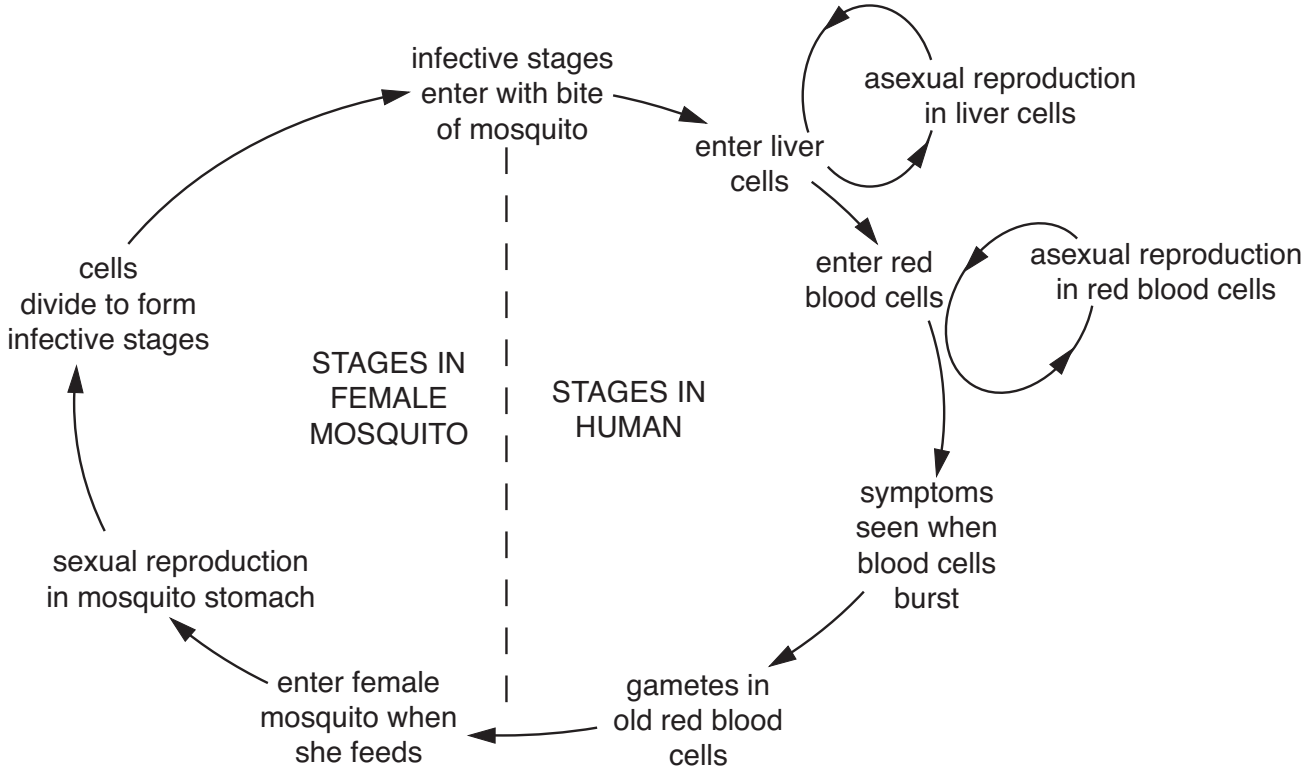

Fig. 10.1

(a) Describe the signs and symptoms of malaria. [4]

(b) Using the information in Fig. 10.1 and your knowledge of vaccines, explain why it has proved so difficult to make a vaccine that is 100% effective against malaria. [5]

(c) Give **three** reasons why not all mosquitoes are capable of infecting humans. [3]

(d) List **three** ways of reducing the numbers of the mosquito. [3]

10 Or

Fig. 10.2 shows the life cycle of *Schistosoma*.

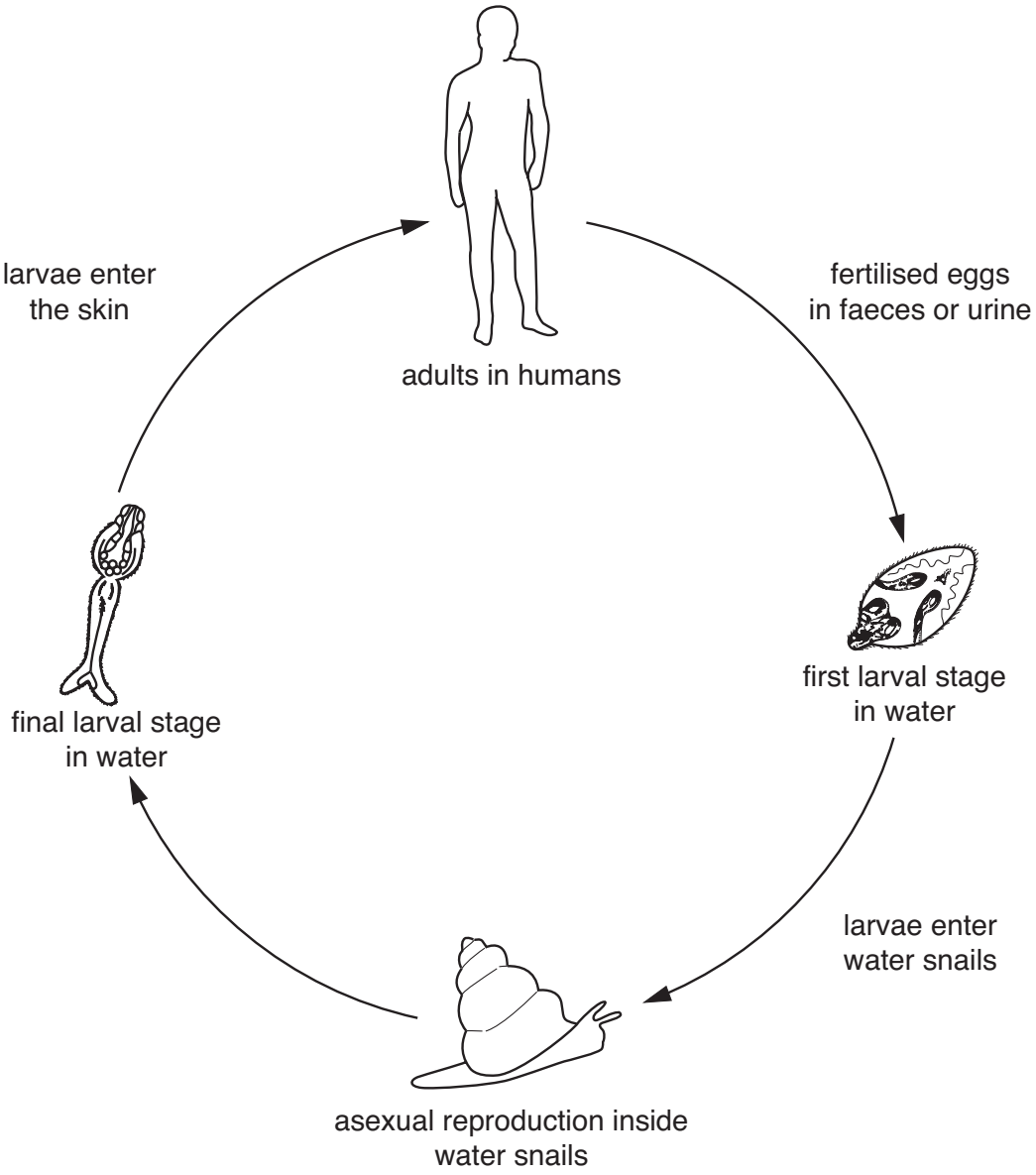

Fig. 10.2

(a) Describe the signs and symptoms of schistosomiasis. [4]

(b) Explain why one contact with an infected mosquito can lead to malaria, but repeated larval contacts are needed to produce symptoms of schistosomiasis. [5]

(c) Explain why schistosomiasis is more common in children than in adults. [3]

(d) Several species of rat are referred to as a *reservoir of infection* for schistosomiasis. Explain fully what this means. [3]

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