

Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

For Examiner's Use
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General Certificate of Secondary Education  
June 2008

**HUMAN PHYSIOLOGY AND HEALTH**  
**Written Paper**  
**Foundation Tier**

**3417/F**  
**F**



Thursday 19 June 2008 9.00 am to 11.00 am

<p><b>For this paper you must have:</b></p> <ul style="list-style-type: none"> <li>a pencil and a ruler</li> </ul> <p>You may use a calculator.</p>
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Time allowed: 2 hours

**Instructions**

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Answers written in margins or on blank pages will not be marked.
- Do all rough work in this book. Cross through any work you do not want to be marked.

**Information**

- The maximum mark for this paper is 120.
- The marks for questions are shown in brackets.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.

**Advice**

- In all calculations, show clearly how you work out your answer.

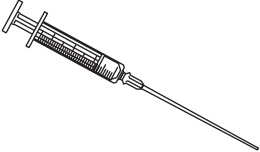
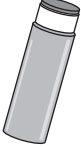


For Examiner's Use			
Question	Mark	Question	Mark
1		7	
2		8	
3		9	
4		10	
5		11	
6		12	
Total (Column 1) →			
Total (Column 2) →			
TOTAL			
Examiner's Initials			



Answer **all** questions in the spaces provided.

**1** Pathogens may be carried on everyday items.

The table shows some of the pathogens found on different items.

Item	Organism carried	Possible disease
 Syringe	Virus	AIDS
 Lip balm	Virus	Common cold
 Mobile phone	Bacteria	Blood poisoning
 Water bottle	Bacteria	Food poisoning

**1** (a) From the table, name **one** item that:

**1** (a) (i) may carry HIV .....  
(1 mark)

**1** (a) (ii) may carry Salmonella bacteria. ....  
(1 mark)



1 (b) Explain why people should not share water bottles.

.....

.....

.....

.....

.....

.....

(3 marks)

1 (c) State **two** ways in which the body stops pathogens from entering.

1 .....

.....

2 .....

.....

(2 marks)

1 (d) Complete the table to show the type of organism that causes each disease.

Choose words from the list.

**bacteria**

**fungi**

**protocistans**

**viruses**

Disease	Type of organism
Athlete's foot	
Malaria	
Rabies	

(3 marks)

10

Turn over ►



2 (a) (i) Why does the body need calcium?

.....  
 .....

(1 mark)

2 (a) (ii) Why does the body need iron?

.....  
 .....

(1 mark)

2 (a) (iii) Why does the body need protein?

.....  
 .....

(1 mark)

2 (b) **Table 1** shows the mass of nutrients in 100 g of some fruits.

**Table 1**

<b>Fruit</b>	<b>Protein (g)</b>	<b>Carbohydrate (g)</b>	<b>Fat (g)</b>	<b>Fibre (g)</b>	<b>Calcium (mg)</b>	<b>Iron (mg)</b>
Apple	0.2	13.4	0.5	0.3	10.0	0.6
Fig	1.3	7.6	0.2	2.2	80.0	1.0
Guava	0.9	11.2	0.3	5.2	10.0	0.2
Lemon	1.0	11.1	0.9	1.7	70.0	0.2
Mango	0.6	16.9	0.4	0.7	14.0	1.3
Orange	0.7	10.9	0.2	0.3	26.0	0.3
Papaya	0.6	7.2	0.1	0.8	17.0	0.5
Pear	0.6	11.9	0.2	1.0	8.0	0.5
Pineapple	0.4	10.8	0.1	0.5	20.0	2.4



2 (b) (i) Which fruit contains least protein?

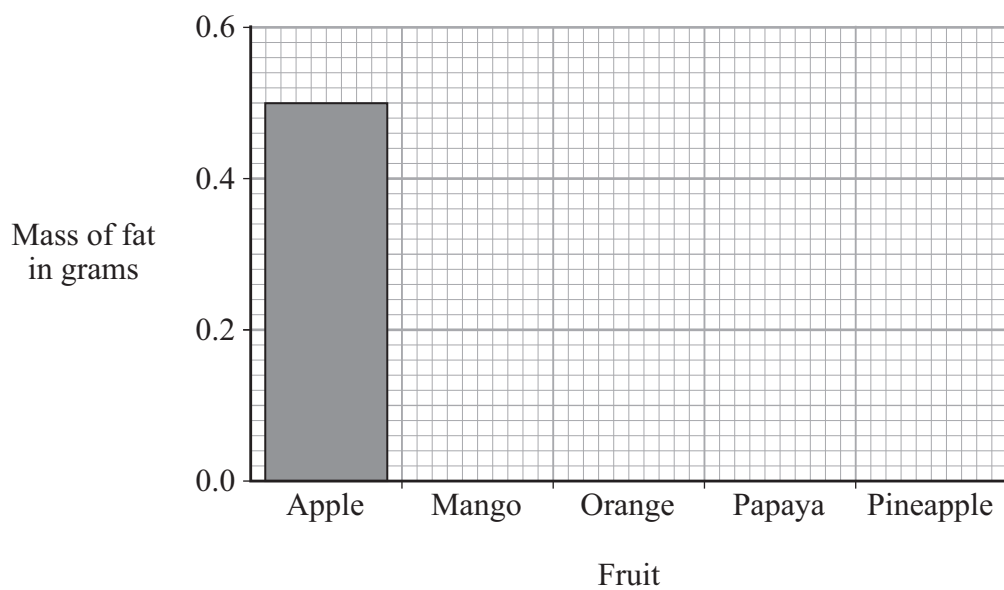
.....  
(1 mark)

2 (b) (ii) Which fruit contains most fibre?

.....  
(1 mark)

2 (c) (i) Plot a bar chart to show the mass of fat in mango, orange, papaya and pineapple. Apple has been plotted as an example.

(3 marks)



2 (c) (ii) Which **two** fruits in the graph contain the same mass of fat?

..... and .....  
(1 mark)

Turn over ►



- 2 (d) **Table 2** shows the amount of calcium needed each day at different ages.

**Table 2**

Age in years	Calcium needed per day in milligrams
1 to 3	500
4 to 8	800
9 to 18	1300
19 to 50	1000
51 and over	1200

- 2 (d) (i) A six year old child eats a 200 g apple.  
How much calcium would the apple provide?

You should refer to **Table 1** on page 4 for your answer.

..... milligrams  
(1 mark)

- 2 (d) (ii) How much more calcium would be needed to meet the child's daily calcium needs?

..... milligrams  
(1 mark)

- 2 (d) (iii) Which of these foods contains most calcium?

Circle the correct answer.

**cheese**

**egg yolk**

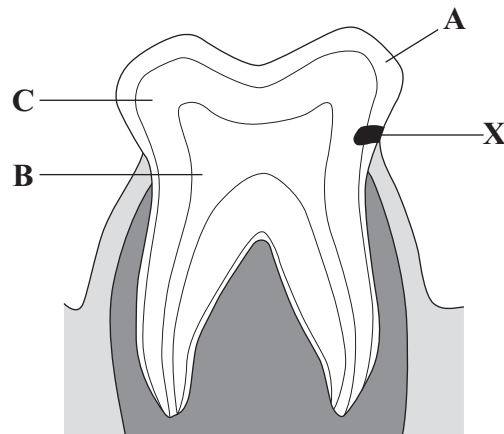
**liver**

**sugar**

(1 mark)



3 The diagram shows a section of a tooth.



3 (a) Name the parts labelled **A**, **B** and **C**.

**A** .....

**B** .....

**C** .....

(3 marks)

3 (b) Name **two** structures found inside the part labelled **B**.

1 .....

2 .....

(2 marks)

3 (c) What type of tooth is shown in the diagram?  
Give a reason for your answer.

Type of tooth .....

Reason .....

.....

(2 marks)

3 (d) The area labelled **X** is a region of decay.

Explain why it is not painful until the decay reaches the part labelled **B**.

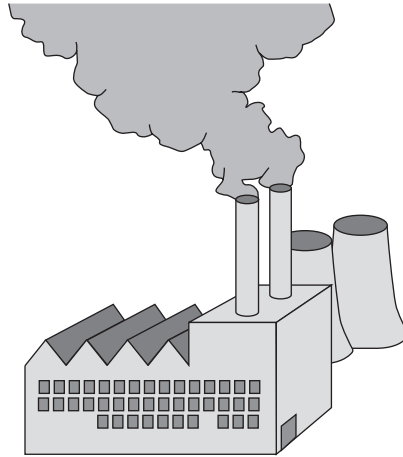
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(1 mark)



4 The picture shows a power station used to produce electricity.



4 (a) Name **two** waste gases that may be produced by this power station.

1 .....

2 .....

*(2 marks)*

4 (b) Explain how waste gases from power stations may affect animals and plants in a river.

.....

.....

.....

.....

*(2 marks)*





4 (c) (i) Name **two** gases that cause global warming.

1 .....

2 .....

(2 marks)

4 (c) (ii) Suggest **one** effect of global warming.

.....

.....

(1 mark)

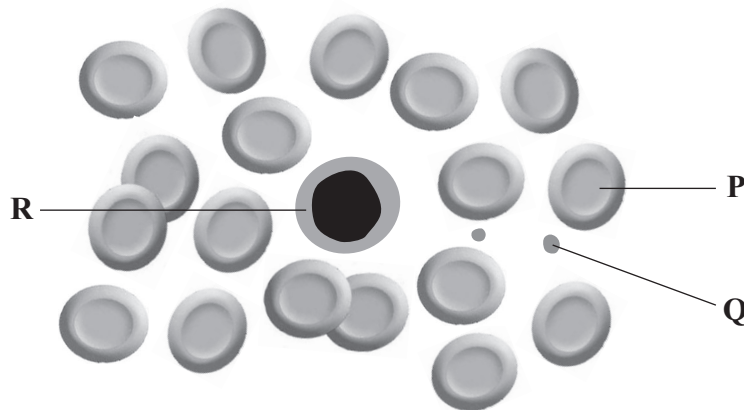
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**Turn over ▶**



5 The diagram shows a sample of blood as seen under a microscope.



5 (a) Give the letter of the part which:

5 (a) (i) carries oxygen ..... (1 mark)

5 (a) (ii) produces antibodies. .... (1 mark)

5 (b) (i) What is the name of the liquid part of the blood?  
 ..... (1 mark)

5 (b) (ii) Name **one** waste substance carried by the liquid part of the blood.  
 ..... (1 mark)

5 (c) Complete the sentences about blood clotting using words from the list.

- antibodies      enzymes      fibrin      iron      plasma      red blood cells**

When the skin is cut, platelets release .....

A chain of reactions occurs which leads to fibrinogen

changing into .....

A mesh of threads is formed which traps .....

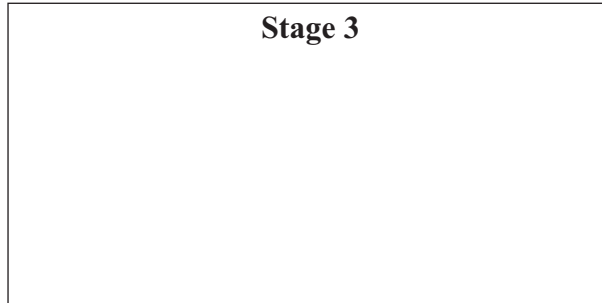
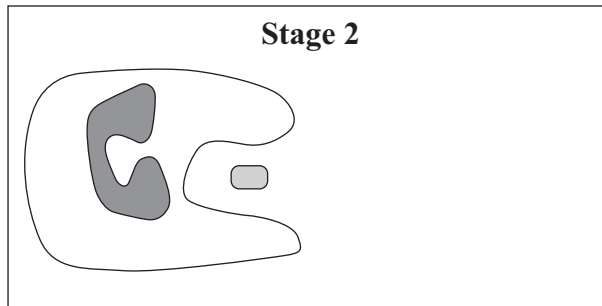
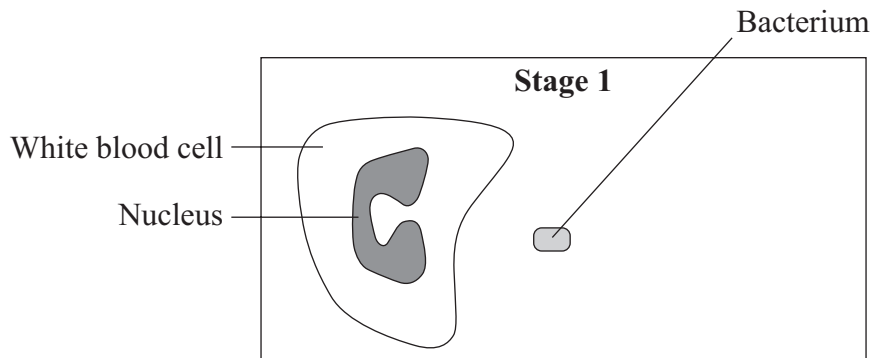
This forms a blood clot.

(3 marks)



- 5 (d) The diagrams show a white blood cell about to ingest a bacterium.

Complete the diagram by drawing, in the box, the next stage in the process.



(2 marks)

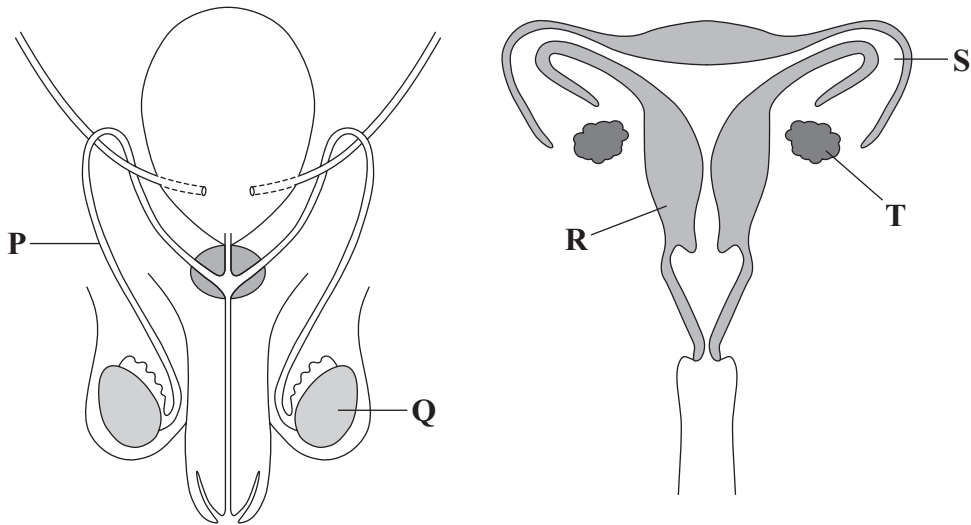
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6 The diagram shows the male and female reproductive systems.



6 (a) Name the parts labelled **Q**, **R** and **S**.

**Q** .....

**R** .....

**S** .....

(3 marks)

6 (b) Give the letters of the **two** parts that produce gametes.

..... and .....

(1 mark)

6 (c) Name **three** structures in the female body through which sperm must pass before reaching the egg.

1 .....

2 .....

3 .....

(3 marks)



6 (d) (i) What is a zygote?

.....  
.....

(1 mark)

6 (d) (ii) How is a zygote formed?

.....  
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(2 marks)

6 (e) Outline the main stages of birth.

*To gain full marks in this question you should write your ideas in good English.  
Put them into a sensible order and use the correct scientific words.*

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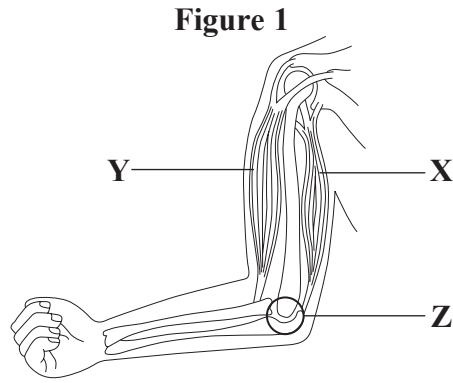
(4 marks)

14

Turn over ►



7 **Figure 1** shows the bones and muscles of the arm.



7 (a) (i) Name the muscles **X** and **Y**.

**X** .....

**Y** .....

*(2 marks)*

7 (a) (ii) Explain how the muscles **X** and **Y** bend the arm at the elbow.

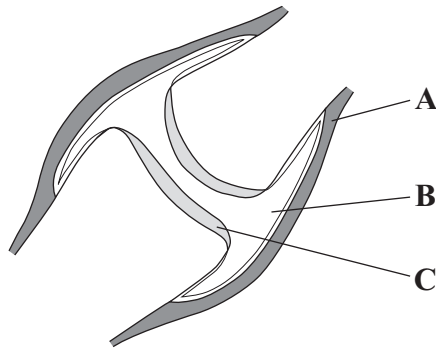
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*(2 marks)*



7 (a) (iii) **Figure 2** is an enlarged diagram of the part labelled **Z** on **Figure 1**.

**Figure 2**



Give the name and function of the parts labelled **A**, **B** and **C**.

**Part A**

Name .....

Function .....

.....  
.....

**Part B**

Name .....

Function .....

.....  
.....

**Part C**

Name .....

Function .....

.....  
.....

(6 marks)

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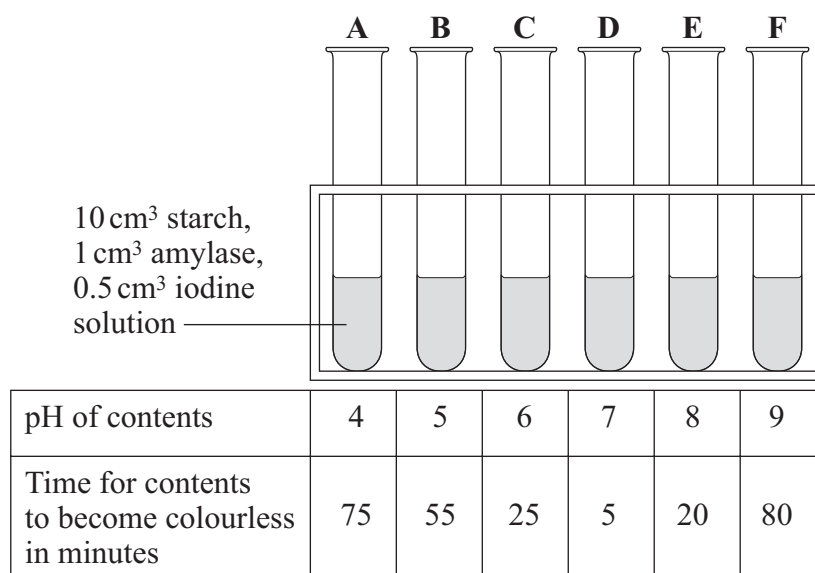


- 8 A student investigated the effect of pH on the reaction between the enzyme amylase and starch.

Six test tubes were set up, each containing the same volume of iodine solution. Drops of acid were added to tubes **A**, **B** and **C** to produce a range of pH values. Drops of alkali were added to tubes **E** and **F** to produce a range of pH values. Amylase was added to all of the test tubes. Starch was added to all of the test tubes.

All the test tubes were kept at the same temperature. The time taken for the mixture in each test tube to change from blue to colourless was recorded.

The diagram shows the experimental set-up and the results.



- 8 (a) Give **two** factors that were kept constant in the investigation.

1 .....

2 .....

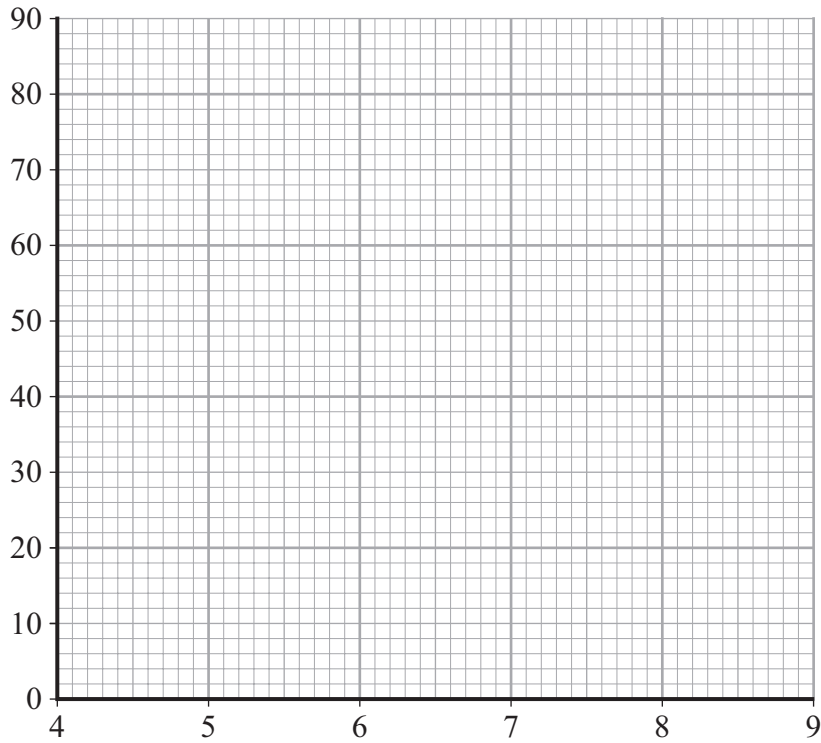
(2 marks)





8 (b) On the graph paper below, draw a line graph of the results.

(4 marks)



8 (c) Explain why the mixture changed from blue to colourless.

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(4 marks)

Turn over ►



8 (d) Describe and explain the pattern shown by the results.

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(4 marks)

14



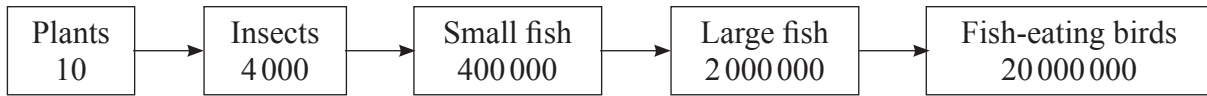
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9 DDT is a chemical that was used as an insecticide to kill insect pests on crops. The flow diagram shows the concentrations of DDT in arbitrary units in a food chain in a river.



9 (a) (i) Suggest how DDT got into the river water.

.....  
.....  
.....  
.....

(2 marks)

9 (a) (ii) How many more times more concentrated was the DDT in the fish-eating birds than in the insects?

..... times  
(1 mark)

9 (a) (iii) The plants are not harmed by the DDT but the birds may be killed by it.

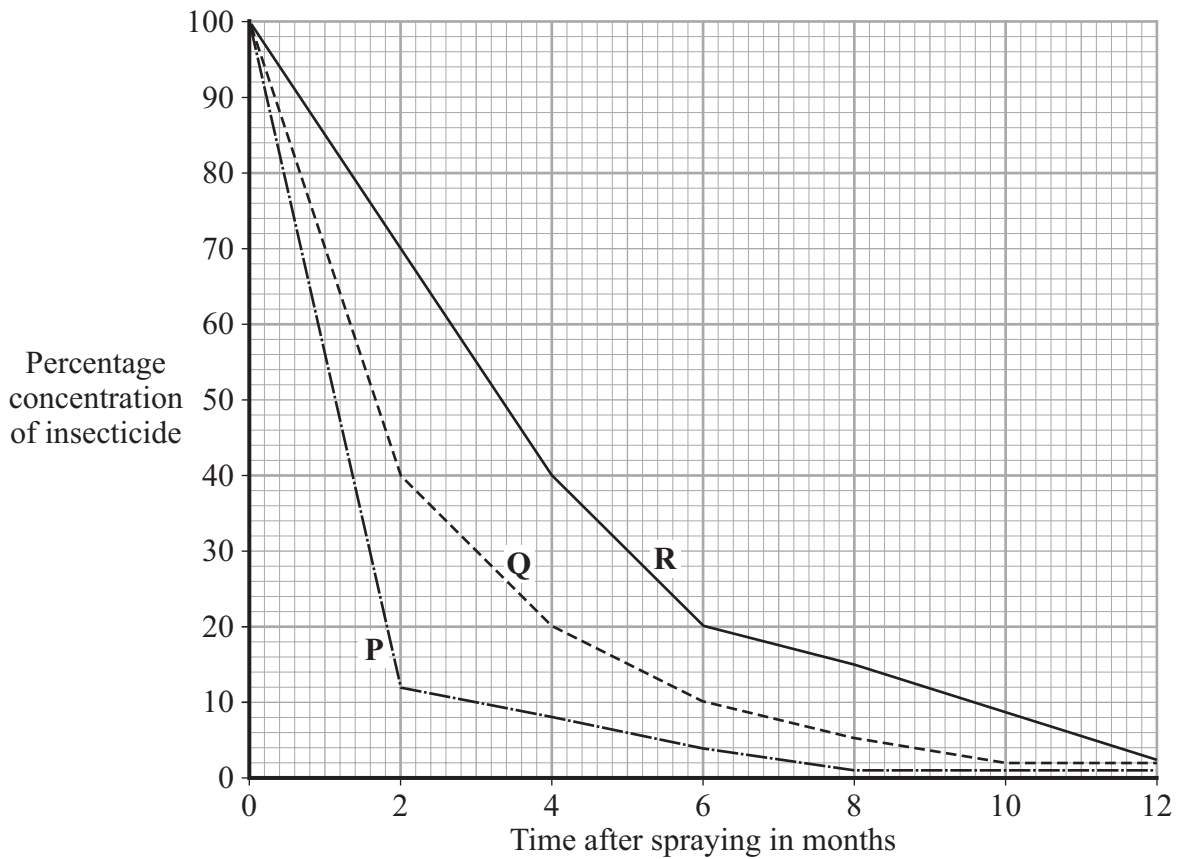
Explain why.

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(3 marks)



9 (b) The graph shows the percentage concentrations in the soil of three different insecticides **P**, **Q** and **R**.



9 (b) (i) What is the difference in the concentration of insecticides **P** and **Q** 2 months after spraying?

..... %  
(1 mark)

9 (b) (ii) By how much did the concentration of insecticide **R** fall between the time of spraying and month 4?

..... %  
(1 mark)

9 (b) (iii) Each insecticide is poisonous to other animals in the soil when the concentration is above 80%.  
Suggest which of the three insecticides a farmer should choose to do the least harm to other animals in the soil.

Give a reason for your answer.

Insecticide .....

Reason .....

.....

(2 marks)



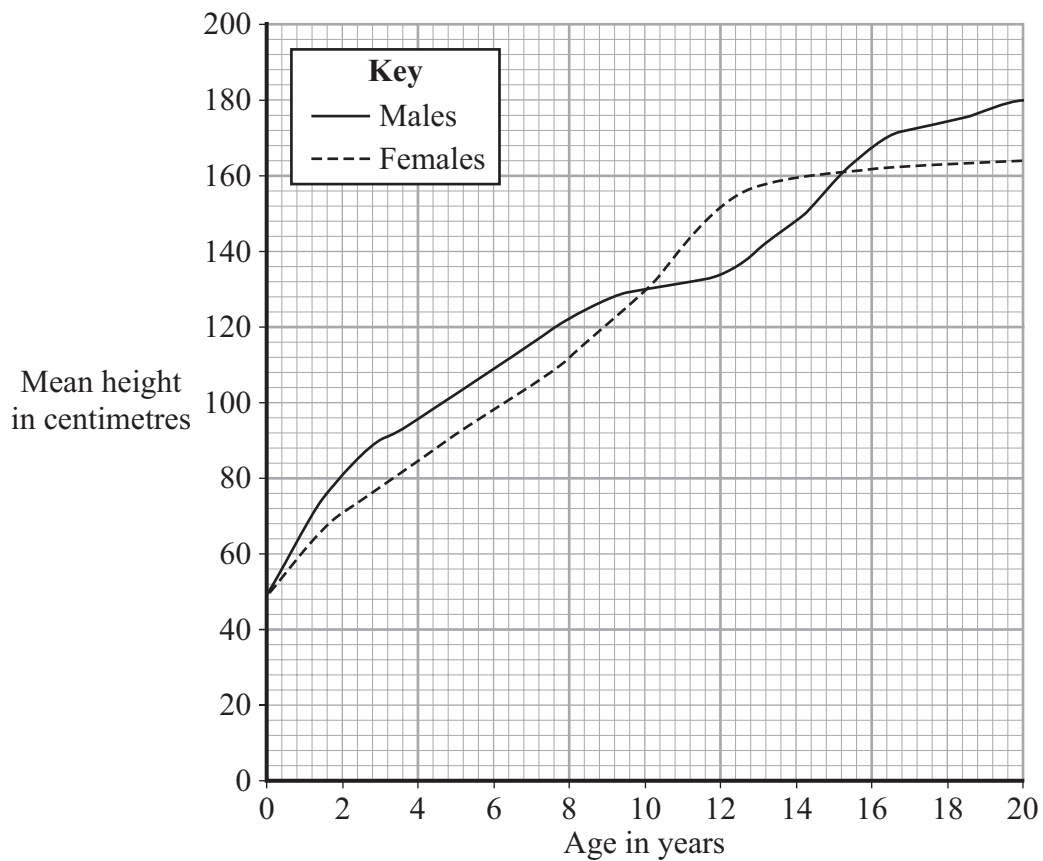
10 (a) Humans pass through **four** stages between birth and death.

Complete the list to show the four stages in the correct sequence.

- 1 .....
- 2 Adolescence
- 3 .....
- 4 Senescence

(2 marks)

10 (b) The graph shows the mean heights for males and females from birth to age 20.



10 (b) (i) What is the mean height of females at four years of age?

..... (1 mark)

10 (b) (ii) During which two-year period is the rate of growth in males the fastest?

Ages ..... to ..... (1 mark)



10 (b) (iii) During which four-year period do males show the slowest rate of growth?

Ages ..... to .....  
(1 mark)

10 (b) (iv) Puberty is a time of rapid growth.

During which two-year period does puberty take place in:

males

Ages ..... to .....

females?

Ages ..... to .....  
(2 marks)

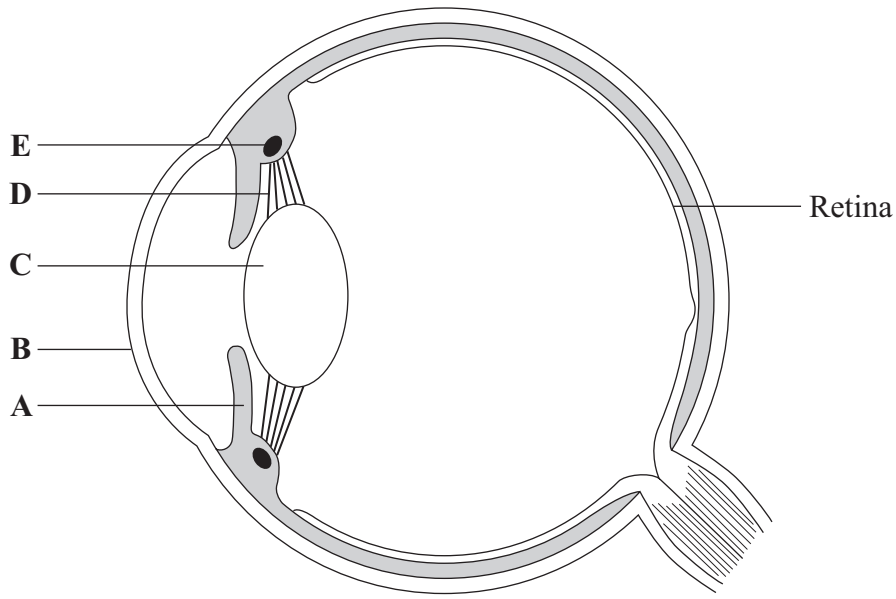
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11 (a) The diagram shows a section through the eye.



11 (a) (i) Name the parts labelled A, C and D.

- A .....
  - C .....
  - D .....
- (3 marks)*

11 (a) (ii) Which **two** parts of the eye focus light onto the retina?

- 1 .....
  - 2 .....
- (2 marks)*

11 (a) (iii) Explain how the eye focuses on near objects.

- .....
  - .....
  - .....
  - .....
  - .....
  - .....
- (3 marks)*





**11** (b) Describe the changes that take place in the eye when a bright light is shone into the eye.

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*(3 marks)*

<b>11</b>

**Turn over for the next question**

**Turn over ►**



12 (a) What is a drug?

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.....  
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(3 marks)

12 (b) Describe the effects of alcohol on the body.

*To gain full marks in this question you should write your ideas in good English.  
Put them into a sensible order and use the correct scientific words.*

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(5 marks)

**END OF QUESTIONS**

8



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