

**GENERAL CERTIFICATE OF SECONDARY EDUCATION**

**GATEWAY SCIENCE**

**B631/01**

**BIOLOGY B**

Unit 1 Modules B1 B2 B3  
(Foundation Tier)

Candidates answer on the question paper  
A calculator may be used for this paper

**OCR Supplied Materials:**  
None

**Other Materials Required:**

- Pencil
- Ruler (cm/mm)

**Monday 12 January 2009**  
**Morning**

**Duration: 1 hour**



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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**INSTRUCTIONS TO CANDIDATES**

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

**INFORMATION FOR CANDIDATES**

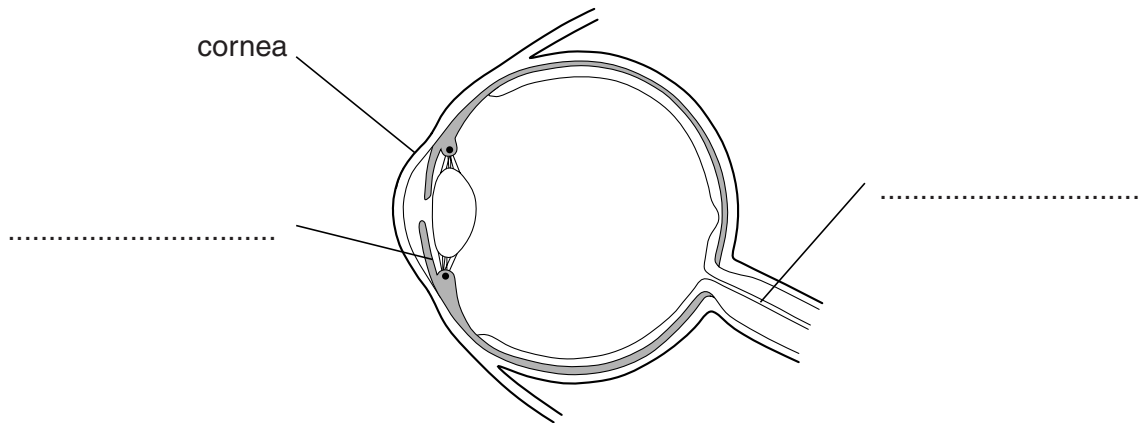
- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **60**.
- This document consists of **20** pages. Any blank pages are indicated.

FOR EXAMINER'S USE		
Section	Max.	Mark
A	20	
B	20	
C	20	
<b>TOTAL</b>	<b>60</b>	

2

Answer **all** the questions.**Section A – Module B1**

- 1 The diagram shows parts of a human eye.



- (a) Finish labelling the diagram.

Choose words from this list.

**iris      optic nerve      pupil      retina**

[2]

- (b) Describe the job of the **cornea**.

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

- (c) Eye colour is a characteristic controlled **only** by genes.

- (i) Write down **one other** characteristic controlled only by genes.

Choose from this list.

**body mass      earlobe shape      scars      spoken language**

answer ..... [1]

- (ii) Which part of the human cell contains genes?

..... [1]

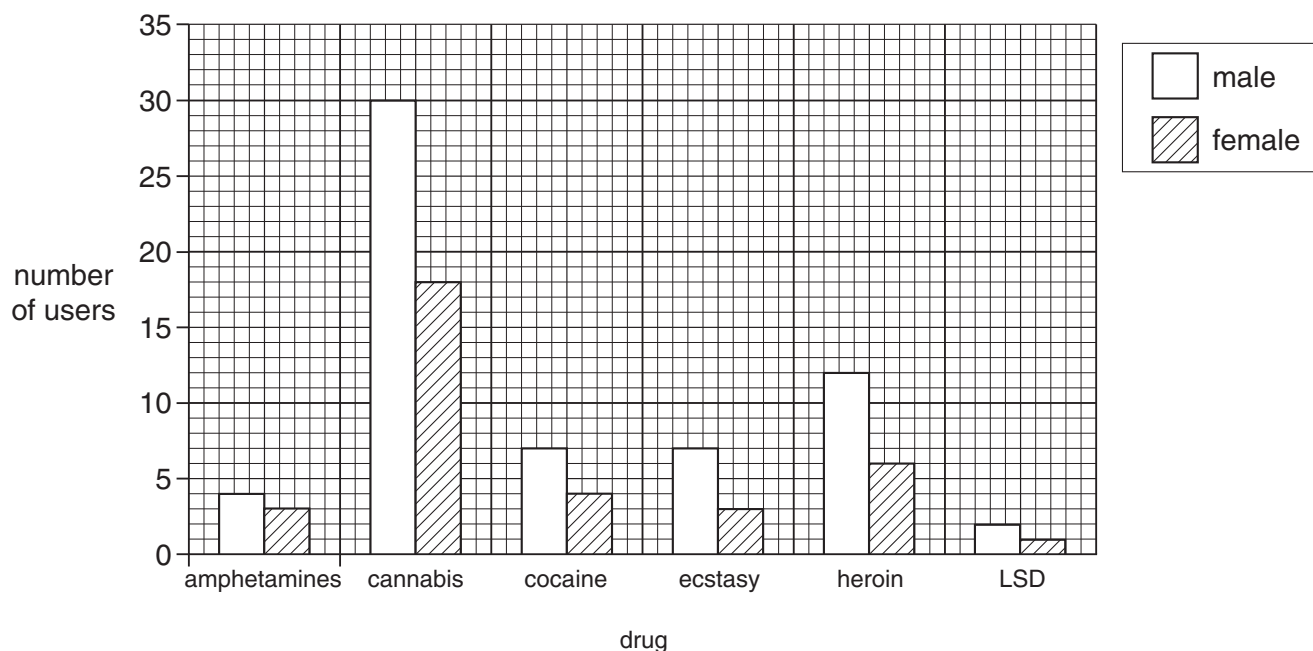
**[Total: 5]**

3

2 Some people use illegal drugs.

A sample of 16-24 year old drug users were asked to name one drug they use.

The bar chart shows how many named each drug.



(a) Which drugs are used by less than 5 males in the sample?

..... [1]

(b) More males than females in the sample use cannabis.

Calculate how many more males than females use cannabis.

answer ..... [1]

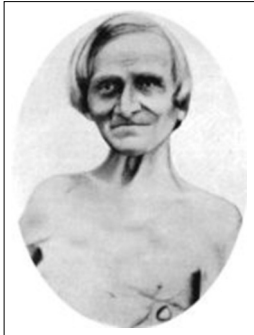
(c) Ecstasy is a **stimulant**.

Describe the effect stimulants have on the brain.

..... [1]

[Total: 3]

### 3 Read the report about Alexis St Martin.



In 1822 Alexis St Martin was shot. He survived but was left with a hole in his stomach. A doctor by the name of Dr Beaumont used the hole to investigate digestion.

Dr Beaumont removed gastric juice from the stomach. He added a piece of meat to the juice. The gastric juice digested the meat.

He also put a piece of meat in the stomach. This meat digested faster.

- (a) Gastric juice contains substances that help with chemical digestion.

Some of these substances are enzymes.

Write down the name of another substance which helps digestion in the stomach.

..... [1]

- (b) Meat contains protein.

Write down the name of **one** enzyme that digests the protein in meat.

..... [1]

- (c) A second type of digestion helps meat to be digested faster in the stomach.

Write down the name of this type of digestion.

..... [1]

- (d) Digestion in the stomach needs energy from respiration.

Finish the word equation for aerobic respiration.

glucose + ..... → ..... + ..... + energy  
[2]

[Total: 5]

4 This question is about diseases.

(a) The lists show examples of diseases and pathogens which can cause disease.

Draw a **straight** line from each **disease** to the **pathogen** that causes it.

disease	pathogen
athlete's foot	fungus
cholera	bacteria
dysentery	protozoa

[2]

(b) Sarah has cut her knee.



Some bacteria enter the cut.

Describe how Sarah's body will protect her from these bacteria.

.....

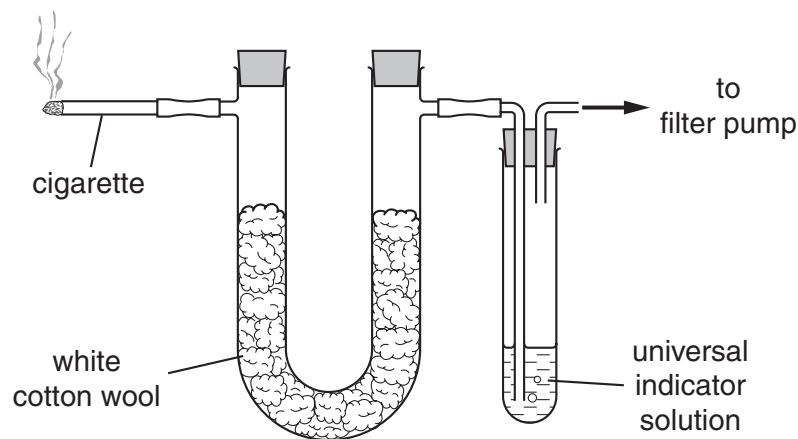
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..... [2]

[Total: 4]

6

5 Look at the diagram of a smoking machine.



(a) Cigarette smoke turns the white cotton wool yellow.

Which chemical in cigarette smoke turns the white cotton wool yellow?

..... [1]

(b) Cigarette smoke causes less oxygen to be carried in the blood.

Which chemical in cigarette smoke causes this lack of oxygen?

..... [1]

(c) Cigarette smoke can cause cancer.

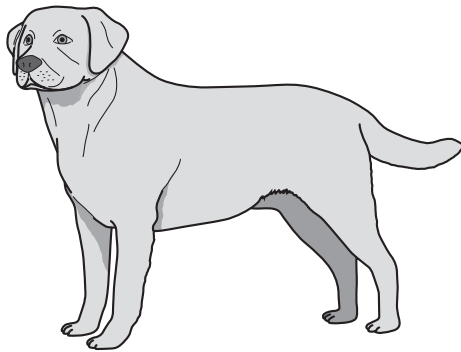
Write down **one other** disease that can be caused by cigarette smoke.

..... [1]

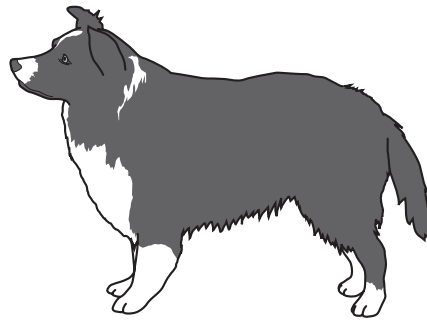
[Total: 3]

## Section B – Module B2

- 6 The pictures show two different breeds of dog.



labrador



border collie

- (a) Look at the pictures. The two dogs show **variation**.

Describe **two** ways you can see in the diagram that the two dogs show variation.

1 .....

2 ..... [2]

- (b) Look at the list.

**amphibians**

**birds**

**fish**

**mammals**

**reptiles**

- (i) To which group of animals do dogs belong?

Choose your answer from the list.

answer ..... [1]

- (ii) Give **one** reason for your choice.

..... [1]

- (c) All the different breeds of dog are descended from wild animals that lived as predators.

Dogs have features that are adaptations to be a predator.

Describe **one** feature of dogs that is an adaptation to be a predator.

.....

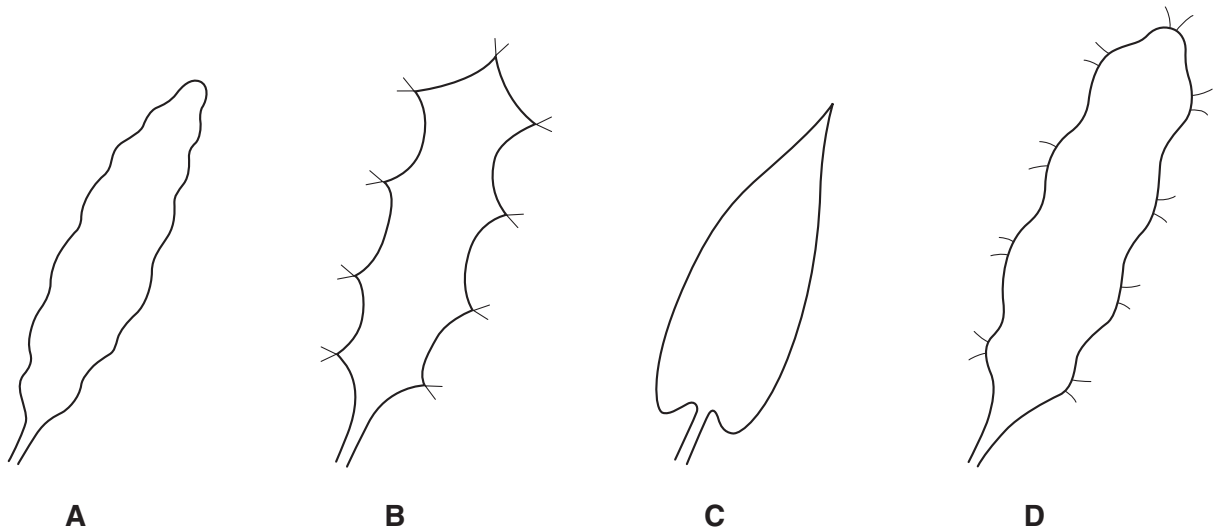
..... [1]

[Total: 5]

Turn over

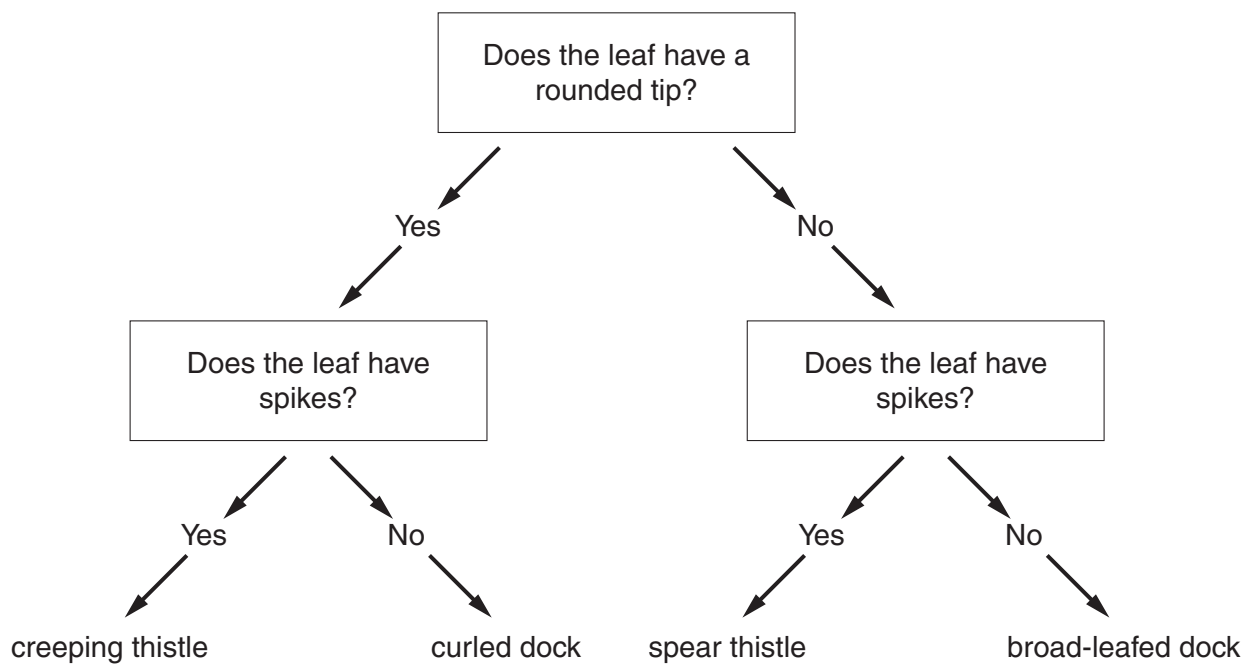
- 7 Tom and Elloise are studying some of the plants growing in the school playing field.

Look at the drawings of leaves from four of these plants.



(drawings not to scale)

- (a) Use the key to identify plants **A** and **B**.



Plant **A** is .....

Plant **B** is ..... [2]



9

- (b) Tom and Elloise use quadrats to count how many there are of plant **A**.

The table shows their results.

quadrat	number found of plant <b>A</b>
1st	0
2nd	1
3rd	0
4th	2

Each quadrat has an area of  $0.25\text{ m}^2$ .

The playing field has an area of  $2000\text{ m}^2$ .

Use this information to estimate the total number of plant **A** in the playing field.

You should show how you work out your answer.

answer ..... [2]

- (c) All plants photosynthesise.

Why do plants need to photosynthesise?

..... [1]

[Total: 5]

- 8 Anglesey is an island off the coast of Wales.

Before the 1960s the only squirrels living on the island were red squirrels.

In the 1960s the first grey squirrels arrived on the island.

By the 1980s red squirrels had disappeared from many parts of the island.

At the same time the number of grey squirrels had increased a lot.

By 1998 there were about 3000 grey squirrels and only about 40 red squirrels on the island.

In 1998 a project started to protect the red squirrels.

This was done by removing grey squirrels from Anglesey.



red squirrel



grey squirrel

- (a) Why did red squirrels need protecting on Anglesey?

..... [1]

- (b) What effect would removing grey squirrels from the island have on the population of red squirrels?

..... [1]

- (c) Suggest **one other** way red squirrels could have been protected on Anglesey.

..... [1]

- (d) Red squirrels and grey squirrels compete for food.

Write down **one other** thing animals compete for.

..... [1]

- (e) Some animals have eyes on the front of the head.

Suggest why squirrels have eyes on the **side** of the head.

..... [1]

[Total: 5]

9 This question is about pollution.

(a) A lot of pollution is caused by using fossil fuels.

Write about how using fossil fuels causes pollution.

In your answer include

- how fossil fuels are used
- the different types of pollution caused.

.....

.....

.....

..... [3]

(b) Look at the list.

**finite resources**

**maintained resources**

**sustainable resources**

What term best describes fossil fuels?

Choose your answer from the list.

answer ..... [1]

(c) CFC gases are used in some aerosols and refrigerators.

CFCs are **not** produced by fossil fuels but they still cause a pollution problem.

What problem does CFC pollution cause?

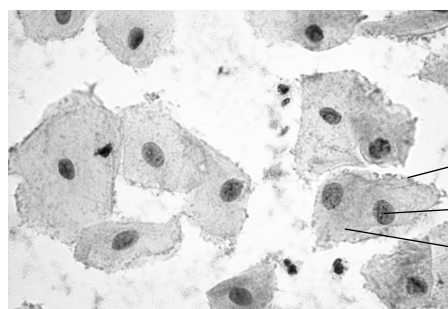
.....

..... [1]

**[Total: 5]**

## Section C – Module B3

10 Gareth is looking at cheek cells using a microscope.



© Dr Gopal Murti / Science Photo Library

(a) Answer the following questions using labelled parts from the photograph.

- (i) Which part of the cheek cell controls the movement of substances into and out of the cell?

..... [1]

- (ii) Where in the cheek cell do most chemical reactions happen?

..... [1]

(b) Gareth now wants to look at some onion cells using a microscope.

Describe how he could prepare a microscope slide of onion cells.

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

[Total: 5]

11 Basil is a gardener.

He keeps a diary of the work that he does in his garden.

Here is part of his diary.

**27th September**



Today I decided to make some new plants.  
My strawberries had sent out long shoots.  
I planted the small plants which were on the end of these shoots.

I made new geranium plants in a different way.  
I cut small shoots off the plants and dipped them into a powder to make them grow roots.  
I then planted the shoots in some soil.

(a) What is in the powder that Basil uses to make his geraniums grow?

Put a ring around the correct answer in this list.

**enzymes**

**plant hormones**

**seeds**

**sperm**

[1]

(b) Basil knows that both his new geranium and strawberry plants will look like their parents.

Explain why they will look like their parents.

.....

..... [2]

[Total: 3]

12 Zoe is expecting a baby and Gary is the father.



(a) Complete the sentences about Zoe's baby by writing a word in each space.

Zoe's baby grew from a single cell called a zygote.

This cell was formed when a ..... cell from Gary joined with an egg cell made by Zoe.

The cell from Gary can swim to the egg cell because it has a .....

The zygote grows into a baby by a type of cell division called .....

[3]

- (b) Zoe reads a book about how babies grow.

It shows how the average mass of baby boys changes during the first six months of life.

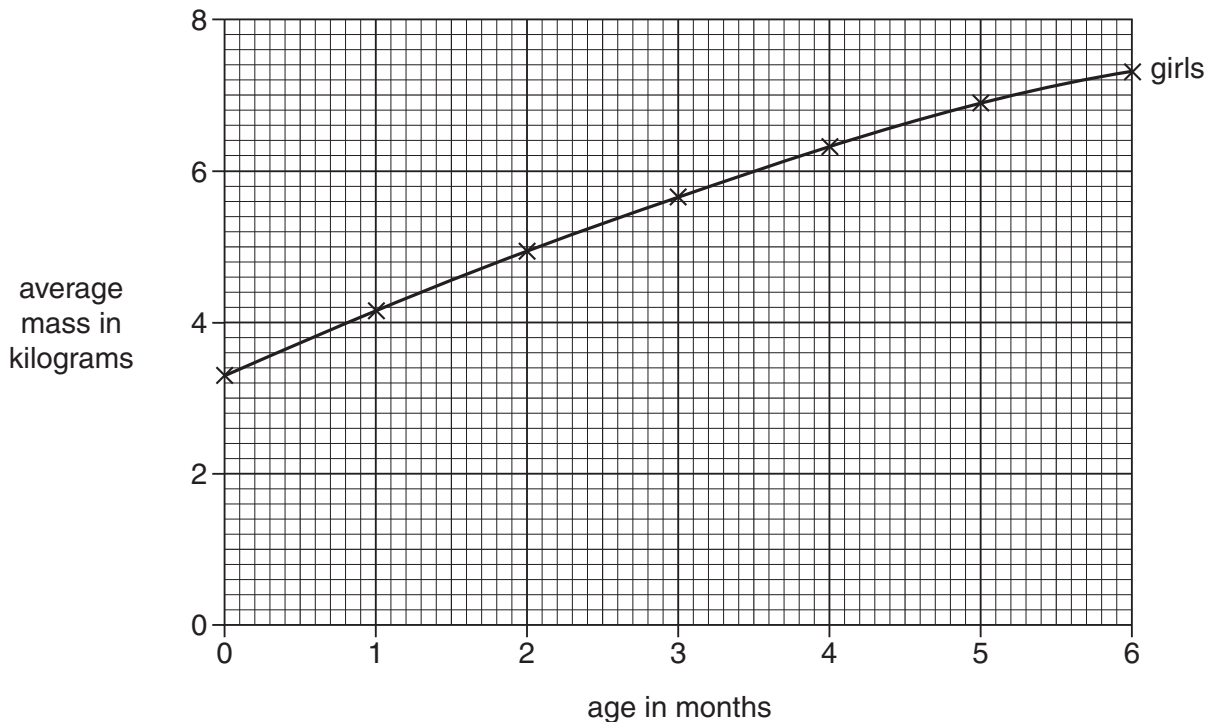
age of baby boy in months	average mass in kilograms
0	3.3
1	4.4
2	5.4
3	6.2
4	7.0
5	7.5
6	7.9

- (i) The graph shows the average mass of baby girls.

Plot the information in the table about baby boys on this graph.

Finish the graph by drawing the best curve.

[3]



- (ii) Write down **one** difference between the growth of boys and girls during their first six months.

.....

..... [1]

[Total: 7]

Turn over

**13** HHT is a genetic disorder.

It makes people have bad nose bleeds.



**(a)** HHT causes problems with blood vessels.

There are three main types of blood vessel in the body.

Arteries carry blood under high pressure out to the body from the heart.

Veins normally carry blood under low pressure back to the heart.

Usually there are very small blood vessels that connect arteries to veins.

**(i)** Write down the name of these small blood vessels.

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

**(ii)** These small blood vessels do an important job in the body.

Put a tick (✓) in the box next to their correct job.

act as a store of cholesterol for the body

☐

allow exchange of materials with tissues

☐

contain muscle cells to pump the blood

☐

contain valves to stop the blood flowing backwards

☐

**[1]**



17

- (b) In a person with HHT some of the vessels that join arteries to veins are missing.

This means that blood under high pressure flows directly into a vein from an artery.

This often causes the vein to break and cause bleeding.

Which part of the blood would cause it to clot during a nose bleed?

Put a ring around the correct answer in this list.

**platelets**

**red blood cells**

**white blood cells**

[1]

- (c) HHT is caused by a change in a gene.

This stops a protein being made that is needed for blood vessel growth.

- (i) Write down the word used to describe a change in a gene.

..... [1]

- (ii) Scientists hope to be able to move genes from one person to another so that they do not develop HHT.

What name is given to this treatment that scientists are trying to develop?

Underline the name in this list.

**cloning**

**fertilising**

**genetic engineering**

**selective breeding**

[1]

[Total: 5]

**END OF QUESTION PAPER**

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| Section C, Q. 10 | Image, © Dr Gopal Murti / Science Photo Library  |

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