



General Certificate of Secondary Education

Centre Number

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Candidate Number

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Biology

Unit 2
Foundation Tier



[GBL21]

GBL21

Assessment

TIME

1 hour 30 minutes.

Assessment Level of Control:

Tick the relevant box (✓)

Controlled Conditions	
Other	

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer the questions in the spaces provided.

Do not write outside the boxed area on each page or on blank pages.

Complete in black ink only. **Do not write with a gel pen.**

Answer **all thirteen** questions.

INFORMATION FOR CANDIDATES

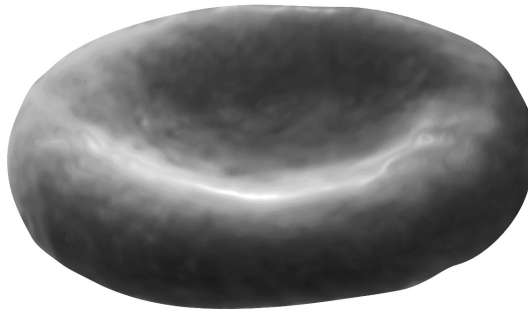
The total mark for this paper is 90.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in Question **9(a)**.



1 (a) The photograph shows a type of blood cell.



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Look at the photograph.

(i) Name this type of blood cell.

[1]

(ii) What is its function?

[1]



(b) (i) What term is used to describe the shape of this blood cell?

_____ [1]

(ii) Explain how this shape helps the blood cell to carry out its function.

_____ [1]

(c) Describe and explain **one other** way this blood cell is adapted to carry out its function.

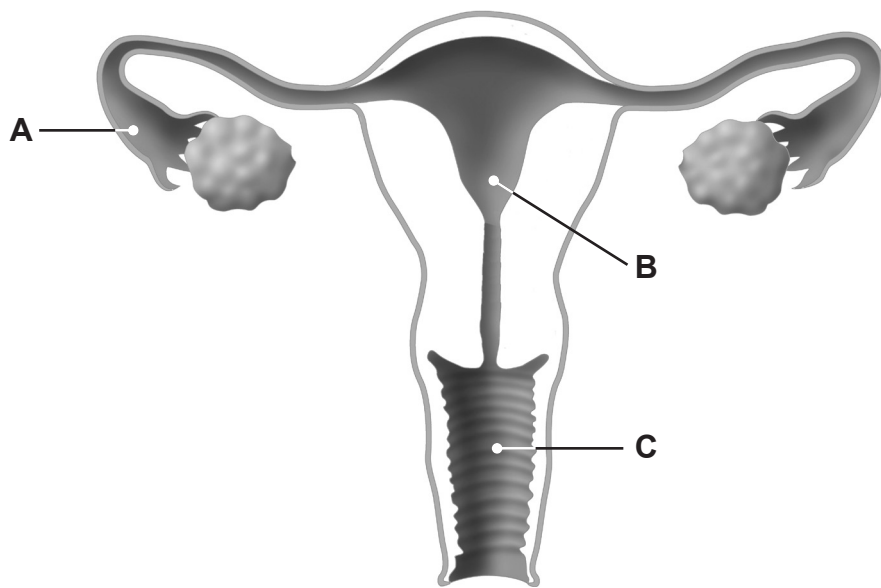
Description _____

Explanation _____
_____ [2]

[Turn over



2 The diagram shows the female reproductive system.



© Monica Schroeder / Science Source/ Science Photo Library

Look at the diagram.

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

A _____

B _____

C _____

[3]

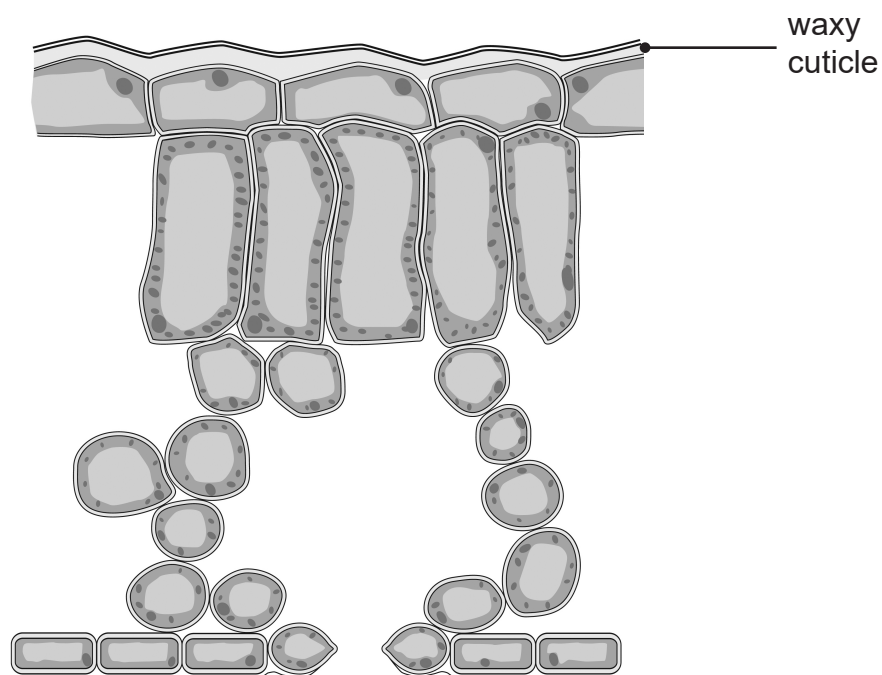
(b) On the diagram, **draw a line labelled X** to show an organ which produces eggs. [1]

(c) Name the female hormone produced by this organ.

[1]



3 The diagram shows a cross section of a leaf.



© Biology for CCEA 2nd Edition by James Napier. (ISBN: 9781780730998) Published by Colourpoint Educational, 2016

Look at the diagram.

(a) On the diagram, **draw an arrow** to show the pathway of water from a spongy mesophyll cell to the outside of the leaf during transpiration. [2]

(b) Describe how the waxy cuticle prevents water loss from the upper surface of the leaf. [1]

(c) Water is used for transpiration.
Give **two other** uses of water in the leaf. [2]

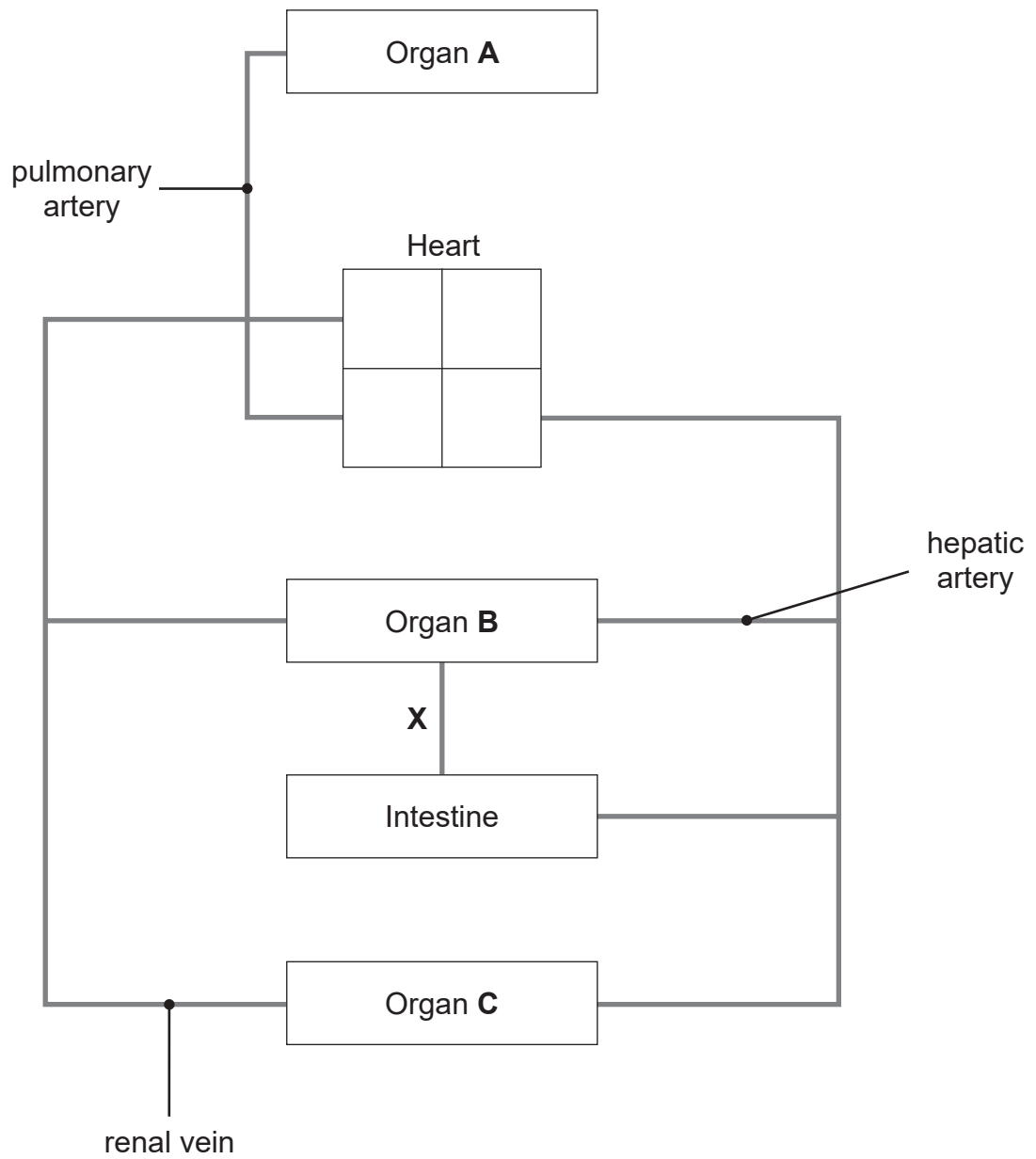
1. _____

2. _____

[Turn over



4 (a) The diagram shows part of the human circulatory system.



Source: Chief Examiner



Look at the diagram.

(i) Name organs **A**, **B** and **C**.

A _____

B _____

C _____

[3]

(ii) Draw an arrow on blood vessel **X** to show the direction of blood flow.

[1]

(iii) Complete the diagram by **drawing a line** to show the pulmonary vein.

[1]

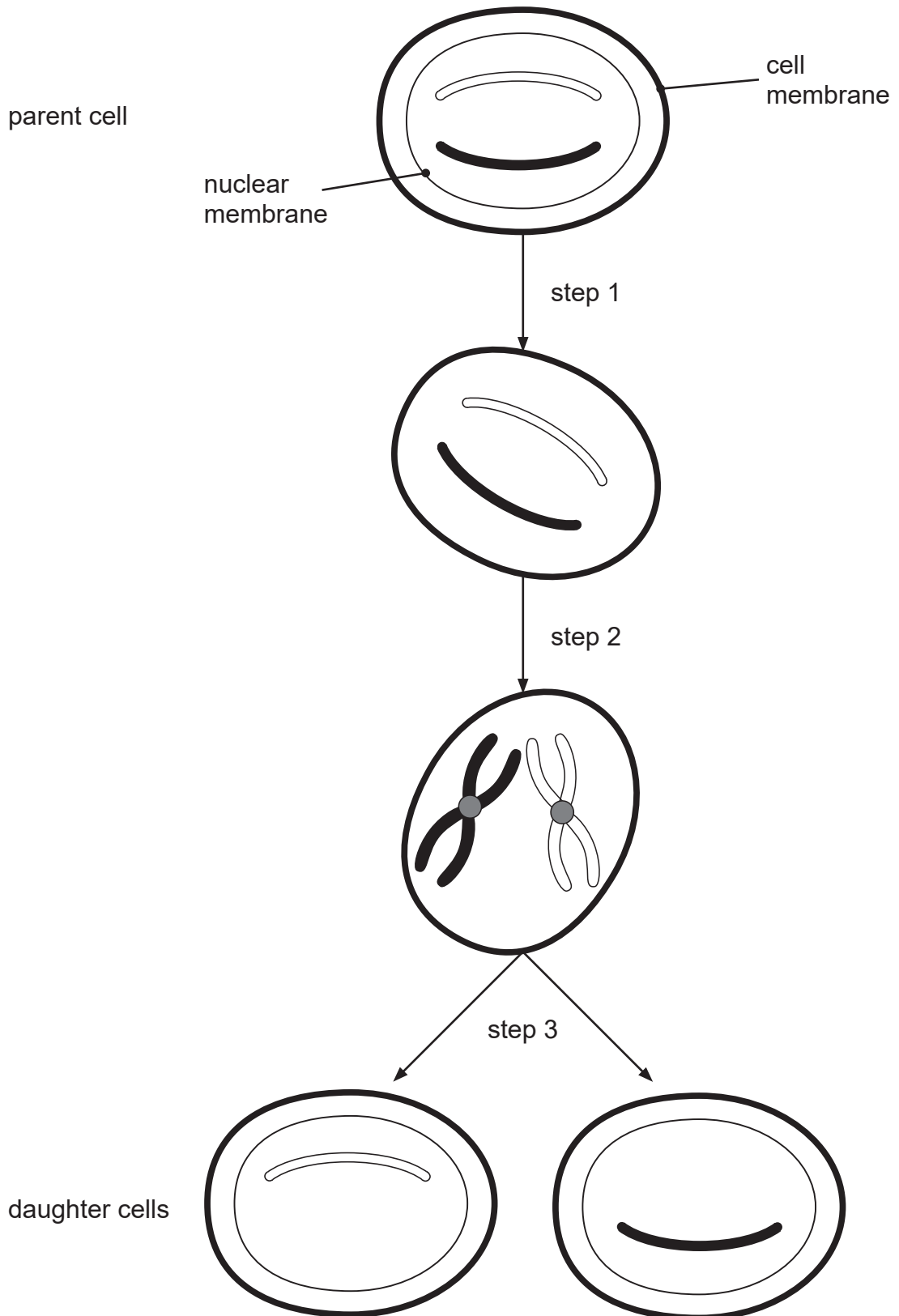
The diagram shows the four chambers of the heart.

(b) Use a black pen to shade the **two** chambers of the heart which carry deoxygenated blood.

[1]



5 (a) The diagram shows a cell dividing by mitosis.



Source: Chief Examiner



Look at the diagram.

- (i) Describe what has happened during **step 1** and **step 2**.

Step 1 _____

Step 2 _____

_____ [2]

- (ii) Complete the diagram to show the chromosomes in the daughter cells. [2]

Daughter cells produced by mitosis differ from daughter cells produced by meiosis.

- (b) Complete the table to show these differences.

Type of cell division	Number of daughter cells	Term describing the number of chromosomes in the daughter cells
Mitosis	2	diploid
Meiosis		

[2]



6 (a) Penicillin is a chemical produced by an organism called *Penicillium*.

(i) Name this type of organism.

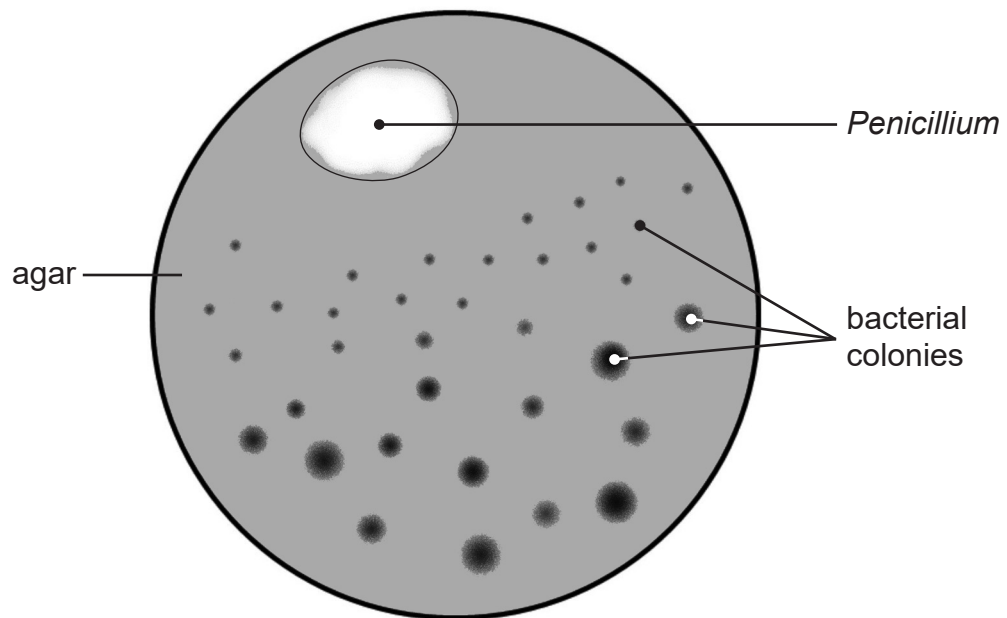
[1]

(ii) What type of chemical is penicillin?

[1]

(b) A scientist grew *Penicillium* on an agar plate inoculated with one type of bacteria.

The diagram shows his results.



Source: Principal Examiner



Look at the diagram.

The scientist concluded that the *Penicillium* produced a chemical which killed some of the bacteria.

- (i) What evidence, shown in the diagram, supports the conclusion that the chemical is **produced** by *Penicillium*?

[1]

- (ii) What evidence, shown in the diagram, supports the conclusion that the chemical does not kill all of the bacteria?

[1]

- (iii) Suggest how the chemical produced by *Penicillium* moves through the agar.

[1]

[Turn over



7 (a) The table gives information on some diseases caused by microorganisms.

(i) Complete the table.

Disease	Type of microorganism	How the microorganism is spread	Prevention
Cervical cancer	HPV virus	sexual intercourse	
	<i>Salmonella</i> bacterium	eating contaminated food	
Chlamydia	bacterium		use a condom
Athlete's foot		damp feet	dry feet thoroughly

[5]

(ii) Explain how a condom prevents the spread of chlamydia.

_____ [1]

(b) Suggest **one** cost to society of people being unhealthy.

_____ [1]





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[Turn over

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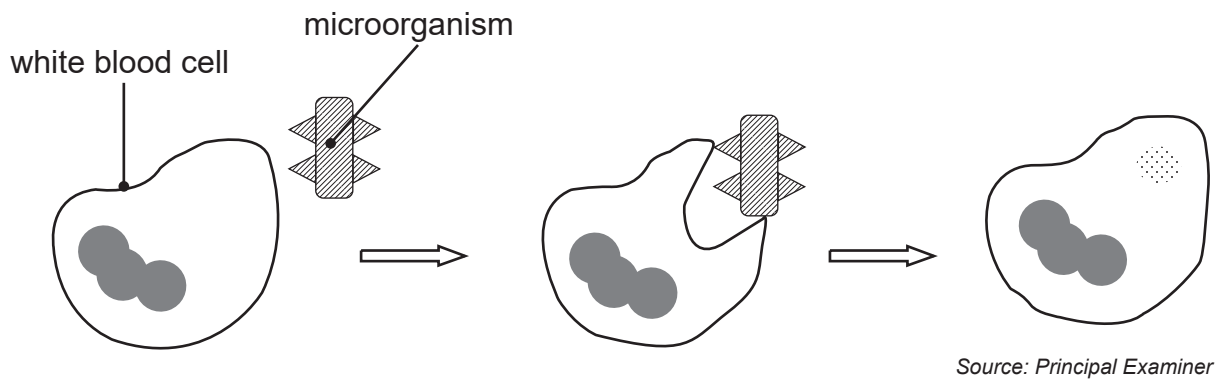


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8 (a) Give **two** ways the body helps prevent the entry of microorganisms.

1. _____
2. _____ [2]

The diagram shows the actions of one type of white blood cell.



Look at the diagram.

(b) Name this type of white blood cell and describe its action.

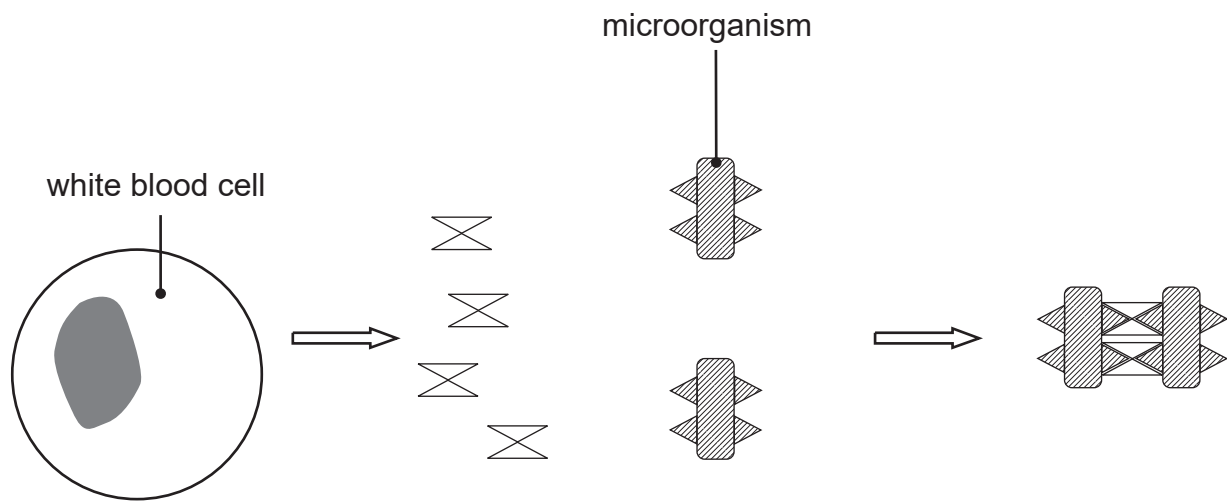
Name _____

Description _____

_____ [3]



The diagram shows the actions of **another** type of white blood cell.



Source: Principal Examiner

Look at the diagram.

(c) Name this type of white blood cell and describe its action.

Name _____

Description _____

[4]



9 Three students took part in a fitness experiment.

They carried out the same type of exercise for the same length of time.

Table A shows some of their results.

Table A

Student	Heart rate at rest /beats per minute	Heart rate during exercise/beats per minute	Time for heart rate to return to rest/minutes
A	60	110	18
B	85	145	30
C	70	125	25



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(b) Table B shows the other results the students obtained.

Table B

Student	Blood flow to muscles at rest / cm ³ per minute	Blood flow to muscles during exercise / cm ³ per minute
A	1200	12500
B	1130	12300
C	1190	12450

(i) Describe the change in blood flow to the muscles during exercise.

[1]

(ii) Explain why this change needs to occur.

[2]

(c) Suggest **one other** change which occurs in the body of each student during exercise.

[1]

[Turn over



10 (a) Cystic fibrosis (CF) is a genetic condition.

It is caused by a recessive allele.

Let **A** represent the normal allele.

Let **a** represent the CF allele.

- (i) Complete the Punnett square to show how two parents, who are carriers, may have a child with cystic fibrosis.

		Mother's gametes	
		A	a
Father's gametes	A		
	a		

[3]

- (ii) Give the genotype of a child with cystic fibrosis.

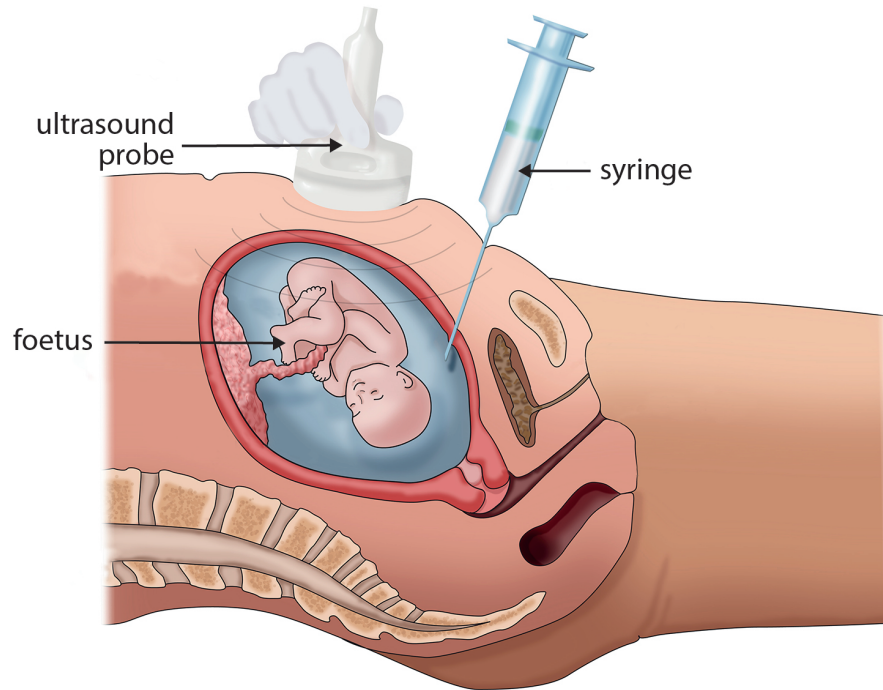
[1]

- (iii) What is the probability that these parents could have a child who is a **carrier** of cystic fibrosis?

[1]



(b) The diagram shows a test used in screening for a genetic condition.



© Monica Schroeder / Science Photo Library

Look at the diagram.

(i) Name the test shown in the diagram.

[1]

The ultrasound probe allows doctors to find the position of the foetus.

(ii) Suggest why it is important to find the position of the foetus.

[1]

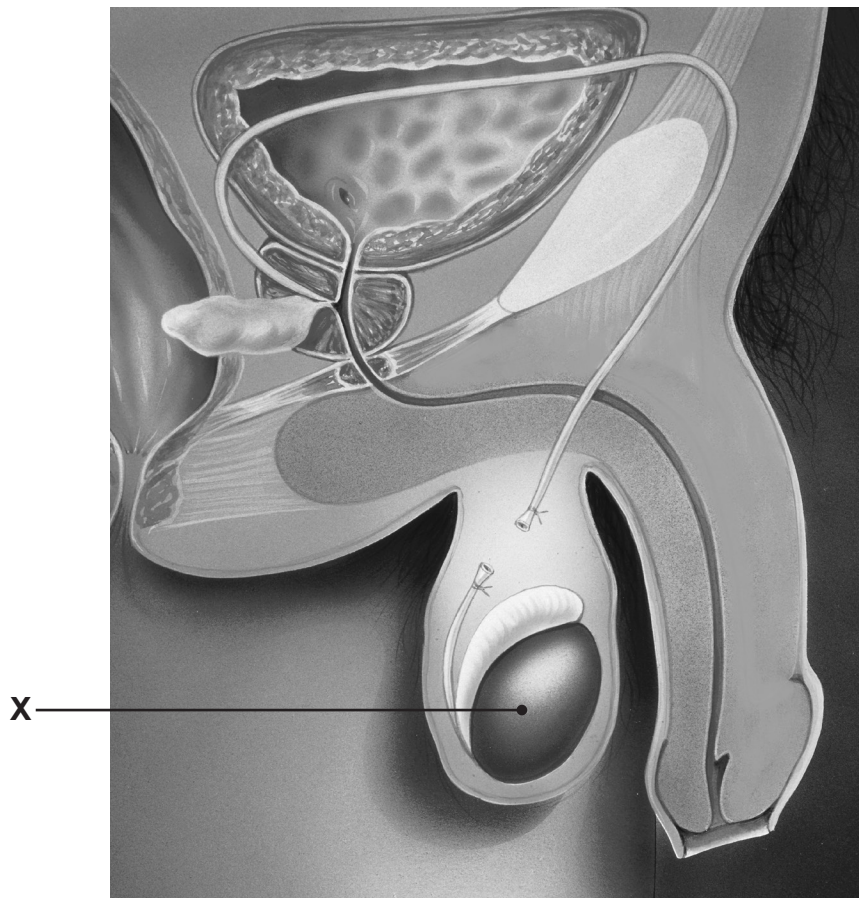
(iii) Give **one** other risk of this test.

[1]

[Turn over



11 The diagram shows a method of male contraception.



© David Gifford / Science Photo Library

Look at the diagram.

(a) Name part X.

[1]

(b) (i) Name this method of contraception.

[1]



(ii) Describe how this method of contraception works.

[2]

(iii) Give **one** advantage and **one** disadvantage of this method of contraception.

Advantage _____

Disadvantage _____

[2]



12 The volume of milk produced by cows is a genetically inherited characteristic.

The table shows how the average volume of milk produced per cow has changed from 2001 to 2017 in the UK.

Year	Average volume of milk produced per cow / litres per year
2001	6346
2005	6986
2009	7061
2013	7543
2017	7889

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(a) Calculate the percentage increase in the average volume of milk produced per cow from 2001 to 2017.

Give your answer to **one** decimal place.

Show your working.

_____ % [3]



(b) Suggest how farmers have used selective breeding to bring about this change in milk production.

[3]

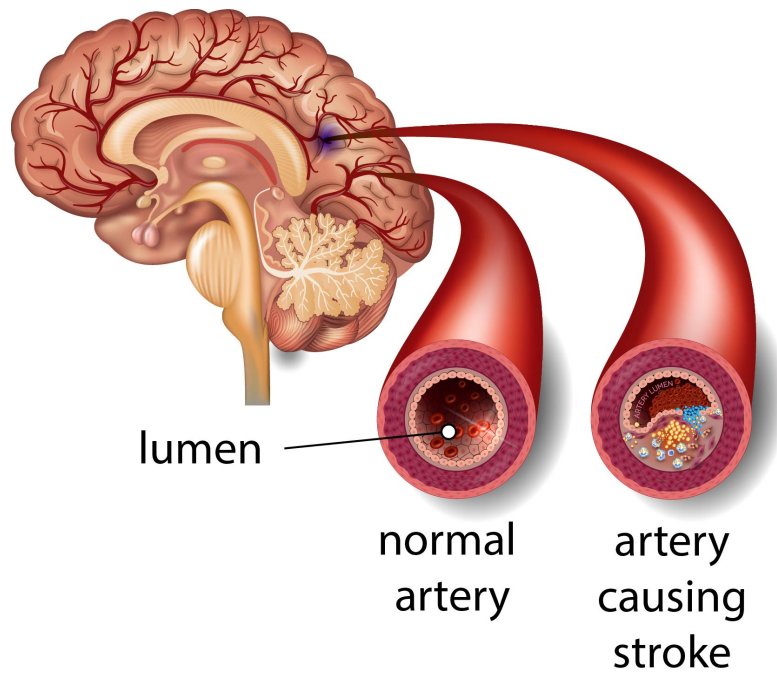
(c) Suggest **one** environmental factor which may affect the volume of milk produced by a cow.

[1]

[Turn over



- 13 (a) The diagram shows part of the brain and blood vessels of a patient who has suffered a stroke.



© Getty Images

- (i) Describe **two** differences between the normal artery and the artery causing the stroke.

1. _____

2. _____

[2]

- (ii) Explain how these differences may lead to a stroke.

[1]



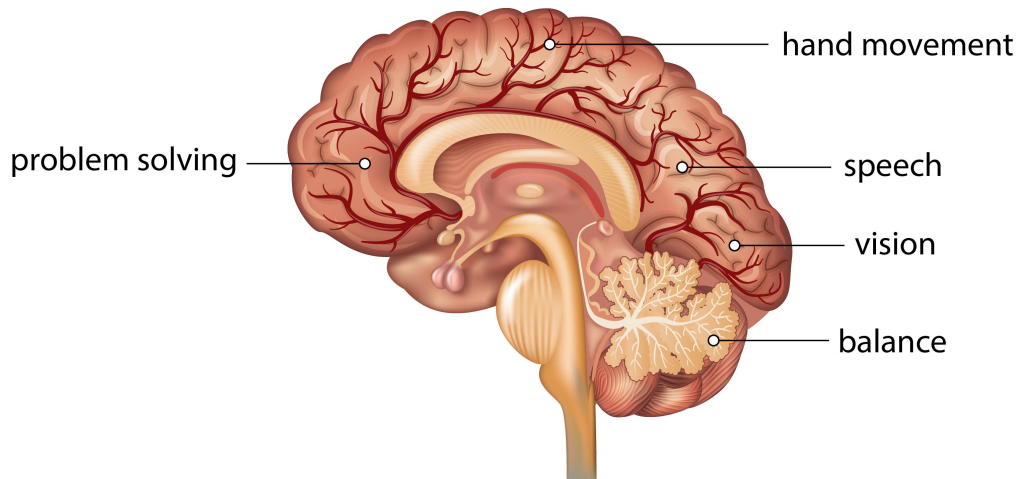
(b) (i) Describe how angioplasty and stents could be used to treat this patient.

[2]

(ii) Explain how angioplasty and stents help reduce the risk of this patient suffering another stroke.

[2]

The diagram shows the functions of some parts of the brain.



© Getty Images

(c) Use the information from **both diagrams** to suggest which brain function of this patient may be affected by a stroke.

[1]

[Turn over



(d) Give **two** lifestyle changes which may help to reduce the risk of a stroke.

1. _____

2. _____

_____ [2]

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For Examiner's use only	
Question Number	Marks
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Total Marks	
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Examiner Number

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