



Rewarding Learning

General Certificate of Secondary Education
2024

Centre Number

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Candidate Number

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Biology

Unit 2

Foundation Tier



[GBL21]

GBL21

TUESDAY 11 JUNE, MORNING

TIME

1 hour 30 minutes.

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 twelve** questions.

INFORMATION FOR CANDIDATES

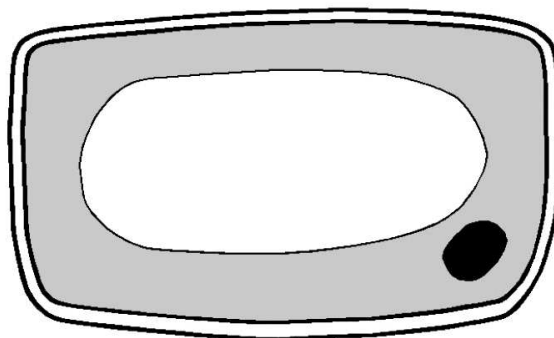
The total mark for this paper is 90.

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 **10(b)**.



- 1 The diagram shows the effect of osmosis on a plant cell which had been left in water for one hour.



Source: Chief Examiner

Look at the diagram.

Choose words from the box to complete the sentences which describe osmosis and its effect on this plant cell.

fully	dilute	plasmolysed	
membrane	water	wall	sugar
concentrated	selectively	turgid	

- Osmosis is the movement of _____ molecules from a _____ solution to a _____ solution through a _____ permeable membrane.
- The cell _____ stops the plant cell from bursting.
- After one hour in water, the plant cell becomes _____. [6]



2 Some blood vessels transport blood to organs.

(a) Draw a straight line to link each blood vessel to the correct organ.

Blood vessel

Organ

vena cava

liver

renal artery

heart

pulmonary artery

kidney

hepatic artery

lungs

[3]

The human circulatory system is described as a double circulation.

(b) What is a double circulation?

[2]



- 3 The table shows how the body mass of males and females may affect their risk of developing Type 2 diabetes.

Body mass	Risk of developing Type 2 diabetes / %	
	Males	Females
underweight	10	6
healthy weight	17	19
overweight	32	29
obese	51	55

Source: "Effect of BMI on lifetime risk for diabetes in the US" – Diabetes Care 2007

Look at the table.

- (a) **Obese** males have a greater risk of developing Type 2 diabetes than males with a **healthy weight**.

Calculate how many times greater.

Show your working.

_____ times [2]

- (b) Obesity can also increase the risk of other types of disease.

Name one of these types of disease.

_____ [1]



(c) Give **two** lifestyle changes a person could make to help them lose weight.

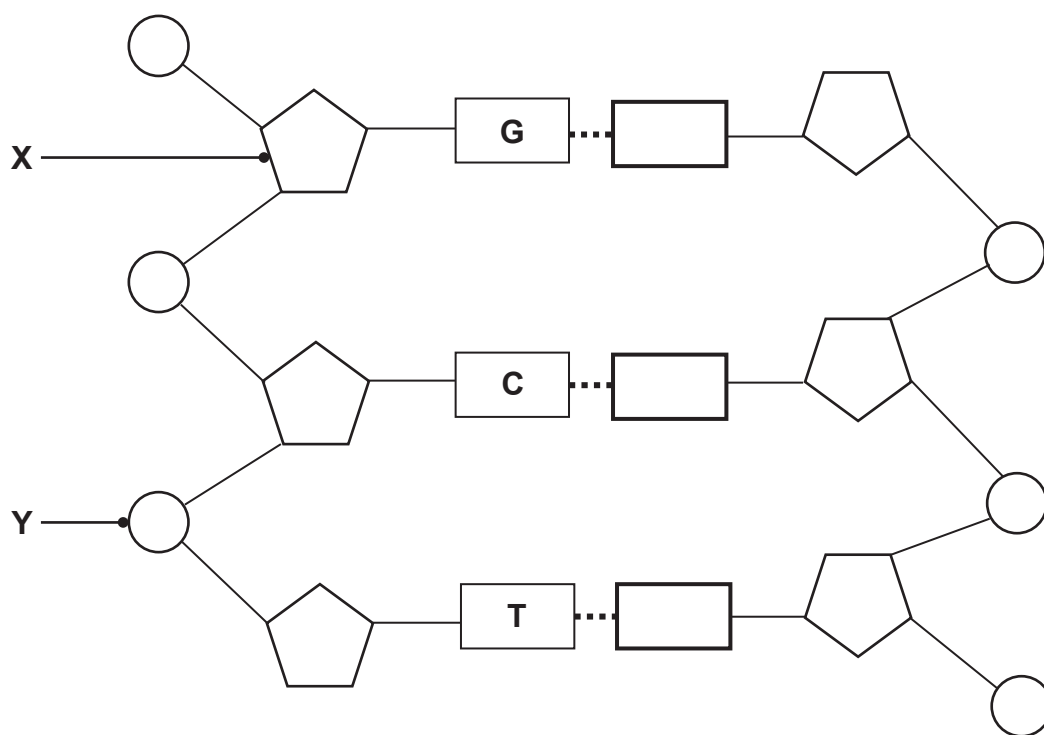
1. _____

2. _____

_____ [2]



4 The diagram shows part of a DNA molecule.



Source: Chief Examiner

Look at the diagram.

(a) Name parts **X** and **Y**.

X _____

Y _____

[2]

(b) Complete the diagram by writing the letters of the three missing bases in the boxes.

[2]

(c) What term is used to describe the shape of a DNA molecule?

[1]

(d) What term is used to describe the entire genetic material of an organism?

[1]



5 The table gives information about three communicable diseases caused by microorganisms.

(a) Complete the table.

Disease	Type of microorganism	How the disease is spread	Prevention
flu		droplet infection	vaccination
	fungus	damp feet	dry feet thoroughly
chlamydia			

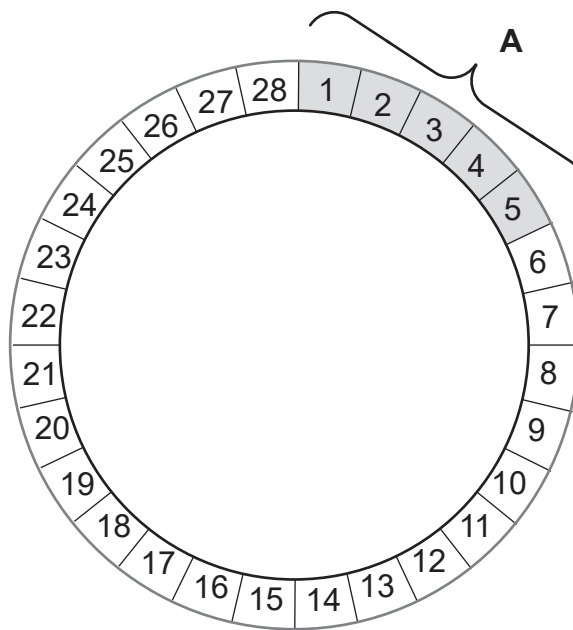
[5]

(b) Describe how flu is spread by droplet infection.

[2]



- 6 (a) The diagram shows a 28-day menstrual cycle.



Source: Principal Examiner

Look at the diagram.

Stage A occurs during the first five days of the menstrual cycle.

- (i) Give the term used to describe stage A.

[1]

- (ii) Describe what happens during stage A.

[2]



(b) (i) On which day is ovulation most likely to occur?

[1]

(ii) Describe what happens during ovulation.

_____ [1]

(c) Give **two** changes which would occur in the menstrual cycle if the woman became pregnant.

1. _____

2. _____

_____ [2]

(d) Name a hormone which controls the menstrual cycle.

[1]

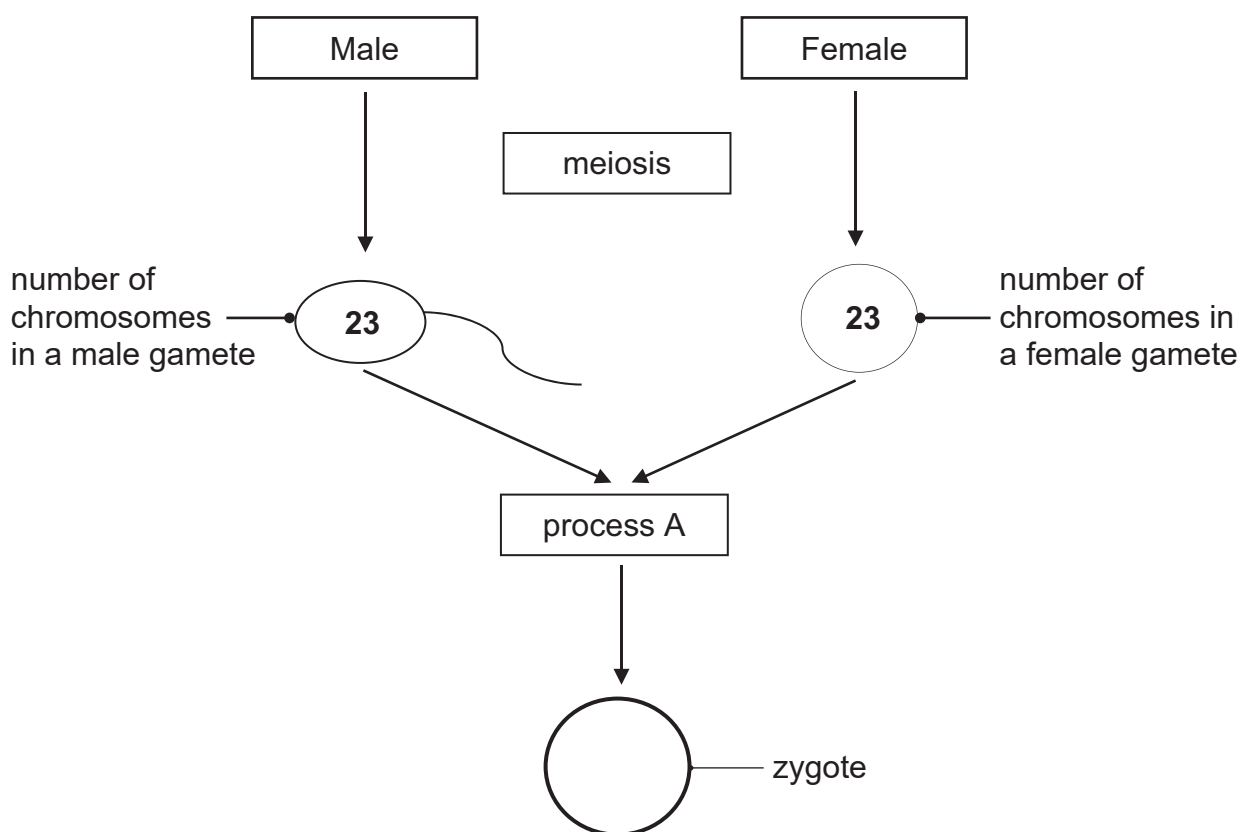
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24GBL2109

7 (a) The diagram shows part of a human life cycle.



Look at the diagram.

(i) Name the organ where meiosis takes place

in the female body. _____

in the male body. _____

[2]

(ii) Name process A.

[1]

(iii) Complete the diagram by writing the number of chromosomes in the zygote.

[1]



(b) (i) Complete the Punnett square to show how the sex of a child is determined.

		male gametes	
female gametes			
	X		
	X		

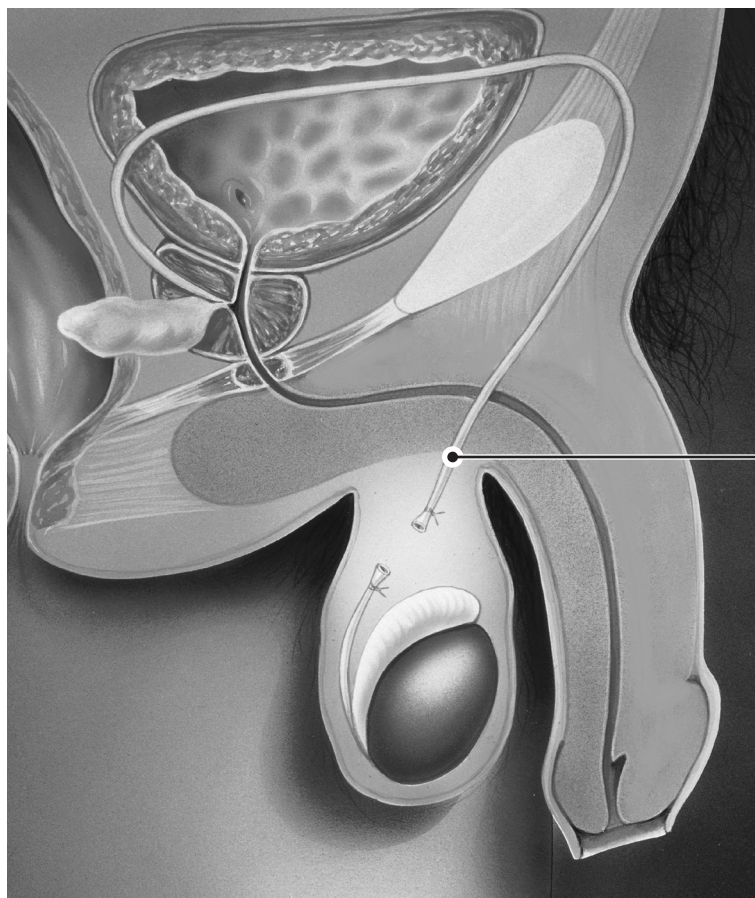
[3]

(ii) What is the percentage probability of a child being a female?

[1]



- 8 (a) The diagram shows a surgical method of contraception in the male reproductive system.



Source: © David Gifford / Science Photo Library

Look at the diagram.

- (i) Part **A** has been cut and tied.

Name part **A**.

[1]



- (ii) Use evidence from the diagram to describe how this method of contraception prevents pregnancy.

[3]

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

Advantage _____

Disadvantage _____

[2]

- (b) Chemical methods of contraception can be used by females to prevent pregnancy.

- (i) Name a chemical method of contraception used by females.

[1]

- (ii) Describe how this method of contraception prevents pregnancy.

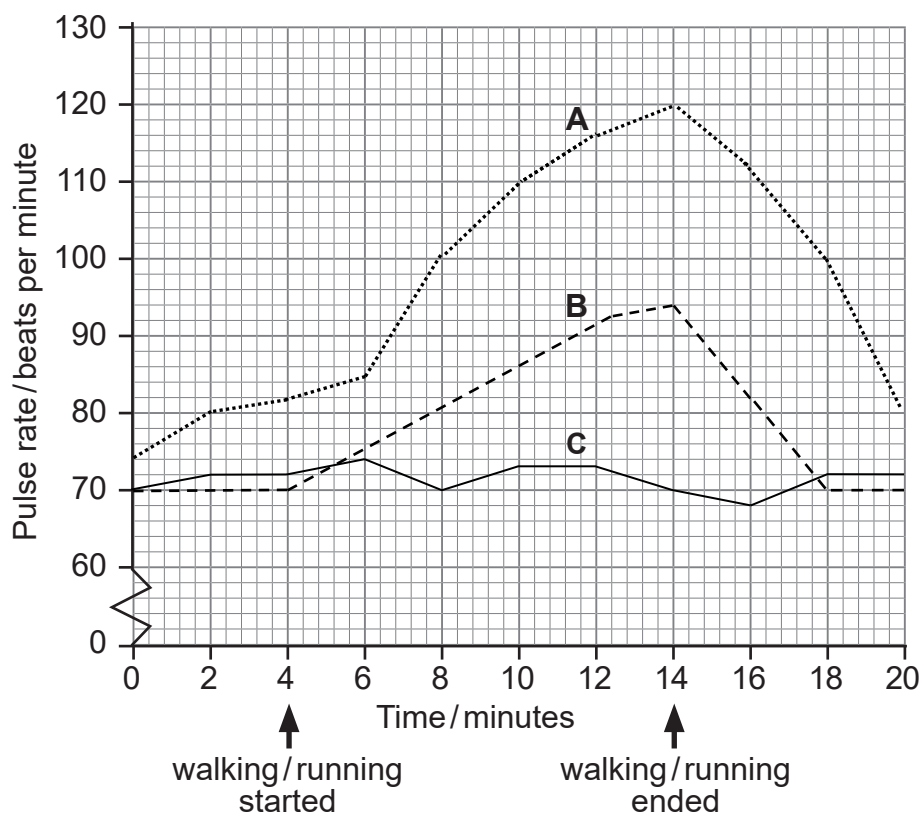
[1]

[Turn over



- 9 Three pupils, A, B and C had their pulse rates recorded every two minutes for 20 minutes. For part of the 20 minutes, two pupils exercised by walking or running. The third pupil did not exercise (at rest).

The graph below shows the pulse rates of the three pupils.



Source: Principal Examiner

Look at the graph.

- (a) Give the letter of the pupil who did not exercise.

Explain your answer.

No data is needed in your answer.

Pupil _____

[2]



(b) Explain why it is necessary for the pulse rate to change during exercise.

[3]

(c) Use the graph to calculate the time taken for the pulse rate of pupil **B** to return to rest, after exercise.

Show your working.

_____ minutes [2]

The pupil who carried out the **running** exercise prepared for the run by jogging on the spot, between 0 and 4 minutes.

(d) How does the graph support this statement?

Give **data** in your answer.

[2]

[Turn over

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24GBL2115

10 Measles is a disease caused by a virus.

A worldwide measles vaccination programme was first introduced in 1963.

The table shows the percentage of people in the world vaccinated against measles between 1980 and 2015 and the number of reported cases of measles.

Year	Percentage of people vaccinated / %	Number of reported cases / millions
1980	48	3.1
1985	72	1.3
1990	75	0.9
2000	77	0.8
2005	80	0.8
2010	84	0.4
2015	85	0.3

Source: © WHO <https://creativecommons.org/licenses/by-nc-sa/3.0/igo/>

Look at the table.

- (a) Give **two** pieces of evidence from the table which suggest the measles vaccination programme has been successful.

No data is needed in your answer.

1. _____

2. _____

_____ [2]



[illegible][illegible][illegible][illegible][illegible][illegible][illegible]

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Immunity to disease can be active or passive.

(c) Describe **two differences** between active and passive immunity.

1. _____

2. _____

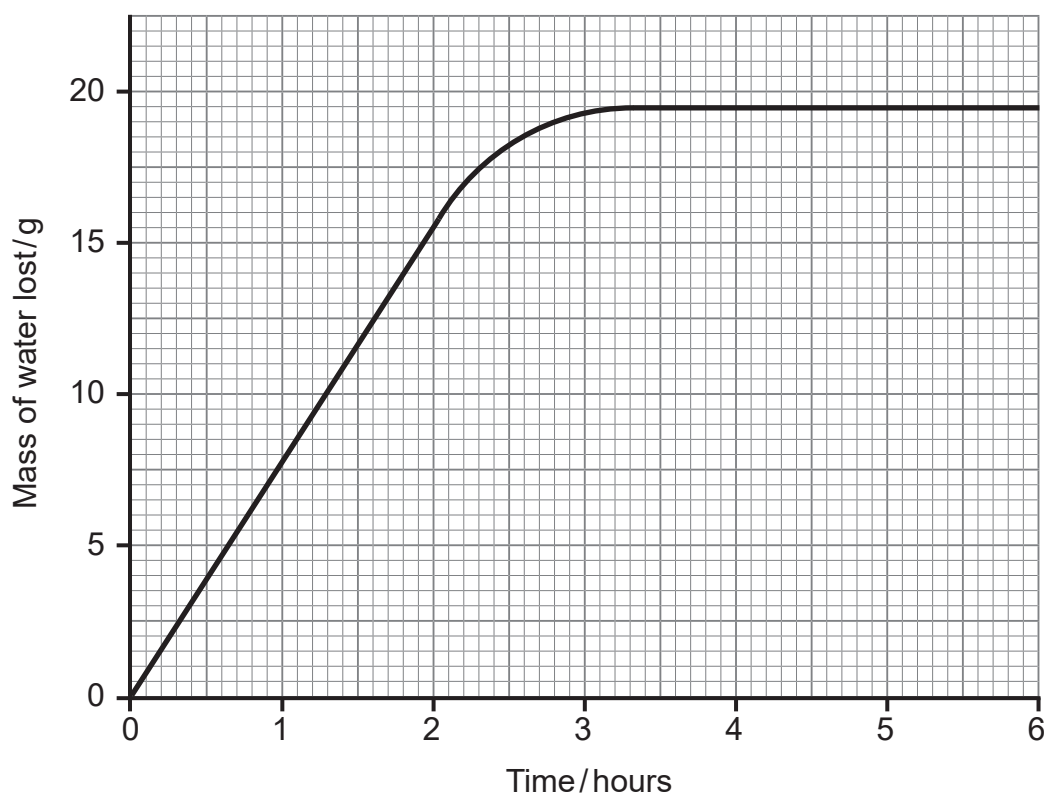
[2]



11 (a) Explain how a plant loses water by transpiration.

[3]

(b) The graph shows the mass of water lost by a plant kept in windy conditions for six hours.



Source: Principal Examiner



- (i) Calculate the rate of water loss per hour over six hours.

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

Show your working.

_____ g per hour [3]

- (ii) **Draw a curve on the graph** showing the water loss for the same plant in humid conditions. [1]

Transpiration is one way a plant uses water.

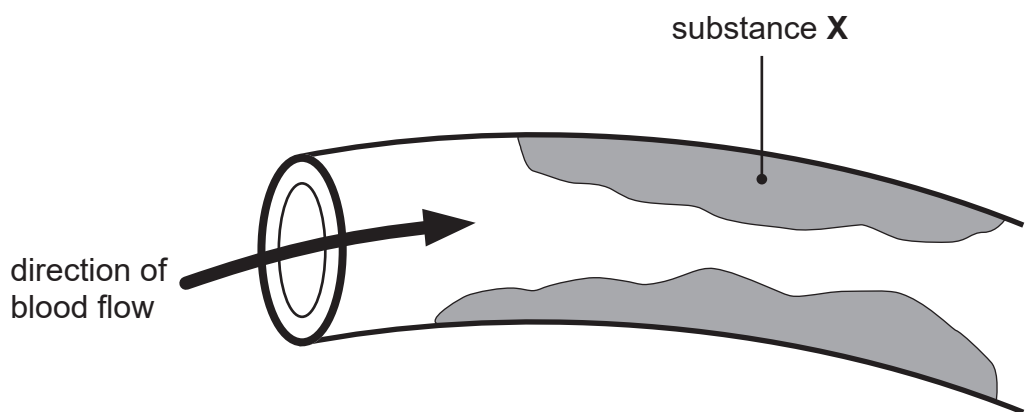
- (c) Give **two other** ways a plant uses water.

1. _____

2. _____ [2]



- 12 (a) The diagram shows a section through an artery of a patient who has had a stroke.



Source: Principal Examiner

- (i) Name substance X.

[1]

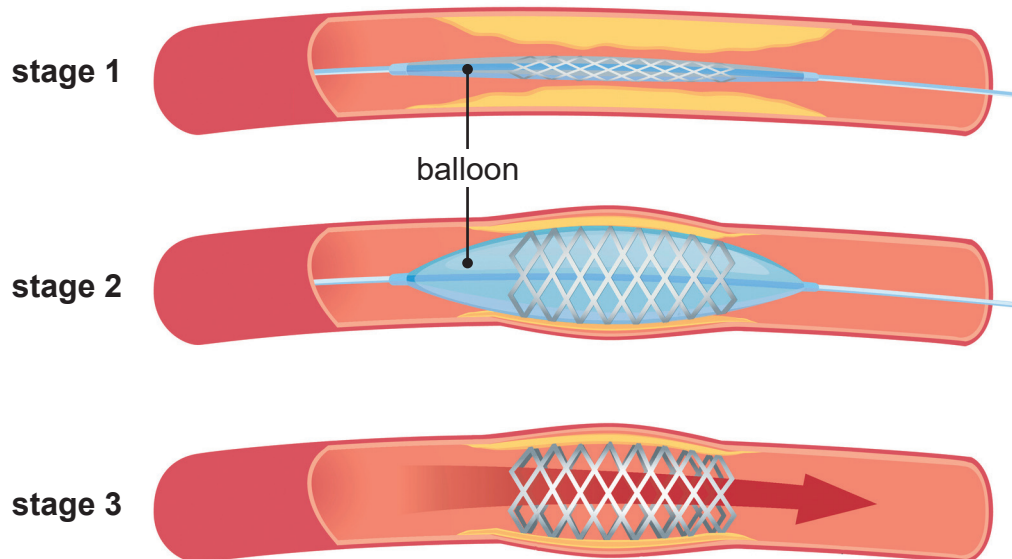
- (ii) Describe and explain why this patient may have another stroke if he does not receive treatment.

[4]



The diagrams show three stages in the treatment received by the patient to reduce the chances of having another stroke.

In stage 1, a wire cage containing a balloon is pushed into the artery.



Source: © Getty Images

(b) Use the diagrams to describe what happens in **stage 2** and **stage 3**.

Stage 2 _____

Stage 3 _____

[4]



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For Examiner's use only	
Question Number	Marks
1	
2	
3	
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9	
10	
11	
12	

Total Marks	
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Examiner Number

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