

0 4

This question is about the circulatory system.

0 4

. 1

Draw **one** line from each blood component to its function.**[3 marks]****Blood component****Function**

Platelet

Red blood cell

White blood cell

Destroys microorganisms

Helps the blood to clot

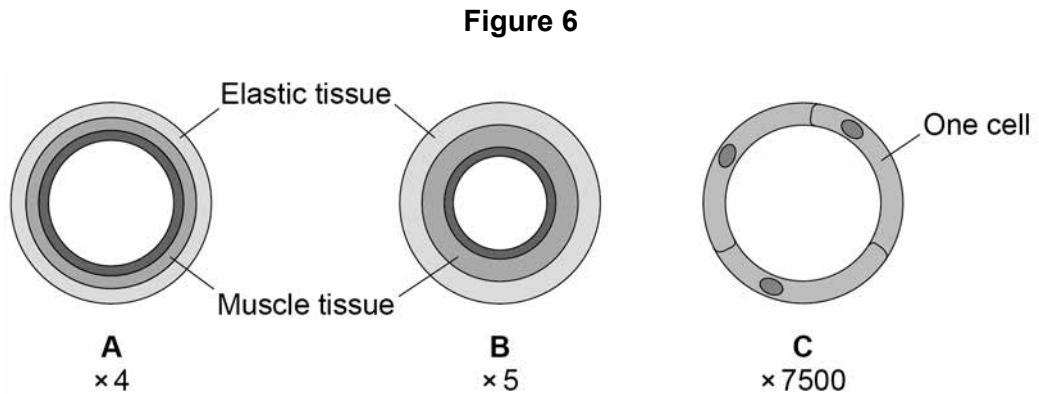
Transports glucose
around the bodyTransports oxygen
around the body

Transports urea

Question 4 continues on the next page**Turn over ►**

0 4 . 2

Figure 6 shows cross sections of the three main types of blood vessel found in the human body. Each blood vessel is drawn to the scale shown.



Which blood vessel has the smallest diameter?

[1 mark]

Tick **one** box.

A	
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B	
----------	--

C	
----------	--

0 4 . 3

Which blood vessel in **Figure 6** is an artery?

Give **one** reason for your answer.

[2 marks]

Blood vessel: _____

Reason: _____



Table 1 gives information about the blood flow in two people.

Table 1

Person	Blood flow through the coronary arteries in $\text{cm}^3/\text{minute}$
A - does not have coronary heart disease	250
B - has coronary heart disease	155

0 4 . 4 Calculate the difference in blood flow between person **A** and person **B**.

[1 mark]

Difference = _____ $\text{cm}^3/\text{minute}$

0 4 . 5 Suggest why blood flow through the coronary arteries is lower in people with coronary heart disease.

[1 mark]

0 4 . 6 Calculate the volume of blood flowing through the coronary arteries of person **A** in 1 hour.

Give your answer in dm^3 .

[2 marks]

Volume of blood in 1 hour = _____ dm^3

Turn over ►



Coronary heart disease can be treated by:

- inserting a stent
- using a Coronary Artery Bypass Graft (CABG).

Table 2 gives information about each method.

Table 2

	Stent	CABG
Procedure	The patient is awake during the procedure. A small cut is made in the skin. A wire mesh is inserted into the coronary artery via a blood vessel in the arm or leg.	The patient is not awake during the procedure. The chest is cut open. A section of blood vessel from the arm or leg is removed. It is used to create a new channel for blood to bypass the blockage in the coronary artery.
When procedure is recommended	When only one blockage is present	When multiple blockages are present
Time spent in hospital after procedure	2-3 hours	at least 7 days
Recovery time after procedure	7 days	12 weeks
Risk of heart attack during procedure	1%	2%
Chance of failure within one year	40%	5%

0 4 . 7 Give **two** advantages of using a stent instead of CABG.

[2 marks]

1 _____

2 _____



0 4 . 8

Give **two** advantages of using CABG instead of a stent.**[2 marks]**

1 _____

2 _____

14**Turn over for the next question****Turn over ►**

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1		additional line from a blood component negates the mark for that component	1 1 1	AO1 4.2.2.3
04.2	C		1	AO3 4.2.2.2
04.3	(vessel) B thick walls or thick muscle / elastic tissue or lumen is small / narrow	do not accept ref to 'cell walls' allow description of 'lumen'	1 1	AO1 4.2.2.2
04.4	95		1	AO2 4.2.2.2
04.5	(because coronary) arteries / they are narrower	allow (because the coronary) arteries are blocked / clogged (with fat)	1	AO2 4.2.2.4
04.6	250 × 60 (= 15 000) or 15 000 15	an answer of 15 scores 2 marks allow 0.25 × 60 allow $\frac{\text{answer to marking point 1}}{1000}$ an incorrect conversion to dm ³ in calculation does not negate marking point 1	1 1	AO2 4.2.2.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.7	any two from: <ul style="list-style-type: none"> • no need to stay as long in hospital (after procedure) or can go home sooner / same day • not as / less invasive or no need for a major operation or no need for general anaesthetic • shorter recovery time or can get back to normal lifestyle quicker or less time needed off work • lower risk of a heart attack (during procedure) 	allow only need to stay 2–3 hours in hospital (after procedure) allow less scarring allow less chance of infection allow only a small cut needed allow only 7 days recovery ignore reference to cost ignore idea that it takes less time overall	2	AO3 4.2.2.4
04.8	lower chance of failure (within one year) only need one operation to treat multiple blockages or can treat multiple blockages at one time	allow only a 5% chance of failure ignore ref to anaesthetic or CABG being a long-term treatment	1 1	AO3 4.2.2.4
Total			14	