

Past-paper walk-through

Blood vessels ■ 9.3

eXercise

Questions in this set

- 0610/23 N25 Q15 ■ 1 mark
- 0610/41 N25 Q2 ■ 15 marks
- 0610/22 J25 Q18 ■ 1 mark

Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- **//** separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = “or words to that effect” – the wording need not match.

Question 15

0610/23 N25 ▪ Q15 ▪ 1 mark

15 What is a feature of veins?

A one-cell-thick wall

B narrow lumen

- C** thick muscular walls
- D** valves are present

Solution 15

Answer: **D**

Why

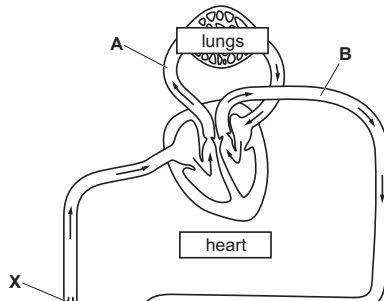
- A vein carries blood back to the heart at low pressure.
- So it has a thin wall and a wide lumen, not a thick muscular wall.
- Valves are its distinctive feature – they stop the low-pressure blood flowing backwards.

Question 2

0610/41 N25 ■ Q2 ■ 15 marks

- 2 (a) Fig. 2.1 is a diagram of part of the human circulatory system.

The arrows show the direction of blood flow.



Question 2

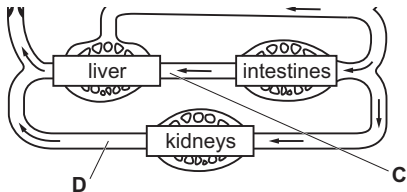


Fig. 2.1

- (i) Complete Table 2.1 by naming the blood vessels in Fig. 2.1 and stating whether the blood in each vessel is oxygenated.

Table 2.1

letter in Fig. 2.1	name of the blood vessel	carries oxygenated blood (yes/no)

Question 2

A		
B		
C		
D		

[4]

- (ii) State the name of structure **X** in Fig. 2.1 and outline its function.

Question 2

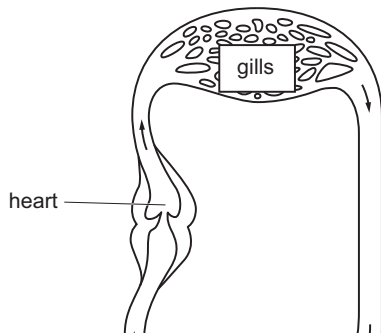
Question 2

Question 2

[2]

(b) Fig. 2.2 is a diagram of part of a fish circulatory system.

The arrows show the direction of blood flow.



Question 2

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Question 2



Fig. 2.2

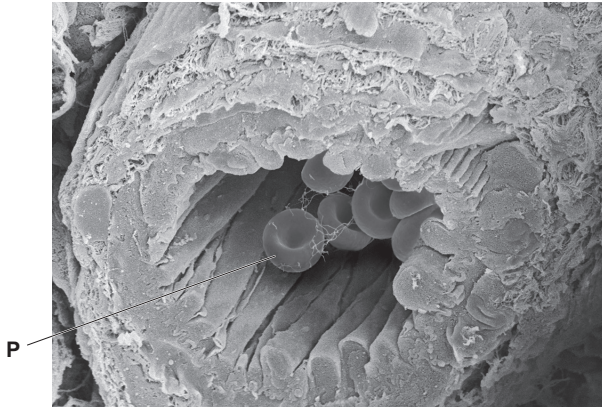
- (i) Describe how the structure of the fish heart in Fig. 2.2 differs from a human heart.

Question 2

- (ii) Explain the advantages of the type of circulatory system found in humans, compared with the circulatory system shown in Fig. 2.2.

Question 2

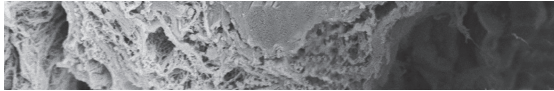
(c) Fig. 2.3 is a photomicrograph of an arteriole.



Question 2



Question 2



magnification $\times 1430$

Fig. 2.3

- (i) Identify the structure labelled **P** in Fig. 2.3.

Question 2

- (ii) The magnification of the image is provided. Write the formula that would be used to calculate the actual diameter of the lumen of the arteriole in Fig. 2.3.

Question 2

(iii) The actual diameter of the lumen of the arteriole shown in Fig. 2.3 is 0.0315 mm.

Convert 0.0315 mm to micrometres (μm).

Question 2

[Total:15]

Solution 2

(a)(i) Mark scheme

- letter on Fig. 6.1 name of the blood
- vessel
- carries
- oxygenated blood
- A
- pulmonary artery
- no
- B

Solution 2

- aorta
- yes
- C
- hepatic portal vein no
- D
- renal vein
- no
- ;;;
- 4 one mark for each correct row

Solution 2

(a)(ii)

Mark scheme

- name: valve ;
- function: prevents back flow of blood / AW ;
- 2

Solution 2

(b)(i) Mark scheme

- any two from:
- (only) two chambers ;
- no, septum / left and right sides / AW ;
- fewer valves ;
- heart (chamber) walls of similar thickness (to each other) ;
- fewer blood vessels (going to and from the heart) ;
- 2 ora throughout
- 0610/41

Solution 2

- October/November 2025
- Guidance

Solution 2

(b)(ii) Mark scheme

- any four from:
 - 1
 - blood is pumped to the lungs then to the body / blood goes through
 - the heart twice in one complete journey / double circulation ;
 - 2
 - oxygenated and deoxygenated blood, are kept separate / do not
 - mix / separated by septum ;
 - 3

Solution 2

- efficient, supply of blood / glucose / oxygen / nutrients (to, the
- body / AW) ;
- 4
- efficient, removal / carbon dioxide / urea / lactic acid (from, body / AW);
- 5
- provides high(er) pressure (in body) ;
- 6
- which allow a high, metabolic rate / rate of respiration ;
- 7
- which allows filtration in kidneys (for excretion) ;

Solution 2

- 8
- low(er) pressure in, pulmonary, artery / circuit / AW ;
- 9
- to prevent damage to (capillaries in the) lungs ;
- 10 allow more time for, gas exchange / absorption of oxygen ;
- 11 AVP ;
- 4
- e.g. larger / steeper, diffusion gradient
- between capillaries and respiring
- tissues / allows large body size / maintenance

Solution 2

- of body temperature

Solution 2

(c)(i)

Mark scheme

- red blood cell ;
- 1

(c)(ii)

Mark scheme

- actual size = image size $\div$ magnification ;
- 1

Solution 2

(c)(iii)

Mark scheme

- 31.5 (μm) ;
- 1
- 0610/41
- October/November 2025
- Guidance

Question 18

0610/22 J25 ■ Q18 ■ 1 mark

18 Which row shows the features of a vein?

	relative thickness of the wall to total vessel diameter	diameter of the lumen	presence or absence of valves
A	thick	large	absent
B	thick	small	present
C	thin	small	absent
D	thin	large	present

Question 18

Solution 18

Answer: **D**

Why

- A vein carries blood back at low pressure, so it needs no thick muscular wall.
- Its wall is thin relative to the vessel, and the lumen is wide to reduce resistance.
- Valves are present, to stop the low-pressure blood flowing backwards.