

Past-paper walk-through

Blood ■ 9.4

eXercise

Questions in this set

- 0610/41 N25 Q2 ■ 15 marks
- 0610/23 J25 Q16 ■ 1 mark
- 0610/42 J25 Q2 ■ 14 marks

Reading the mark scheme

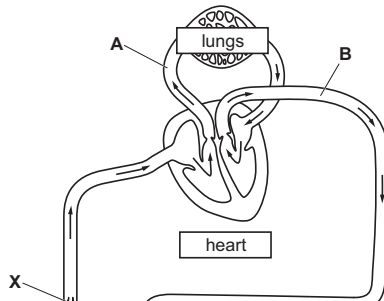
- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- **//** separates answers the examiner 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 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

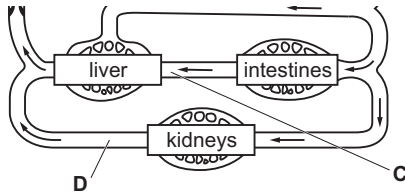


Fig. 2.1

- (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

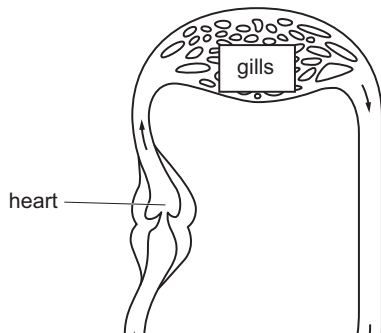
Question 2

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

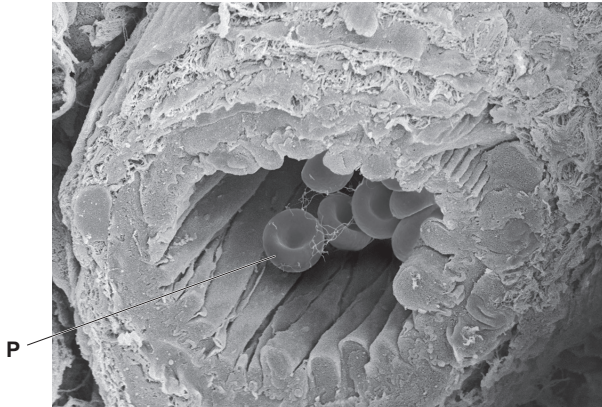
- (i) Describe how the structure of the fish heart in Fig. 2.2 differs from a human heart.

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

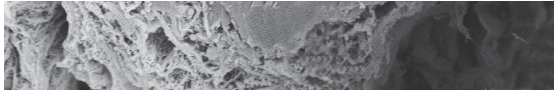
(c) Fig. 2.3 is a photomicrograph of an arteriole.



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)

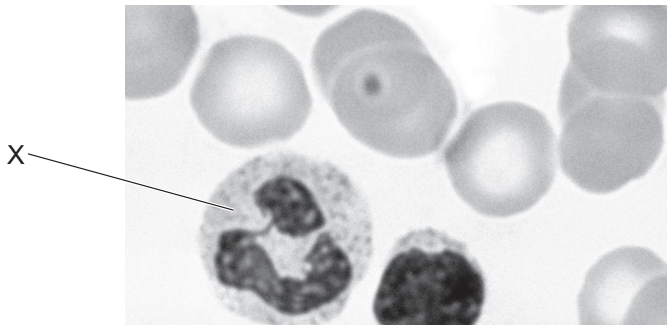
Mark scheme

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

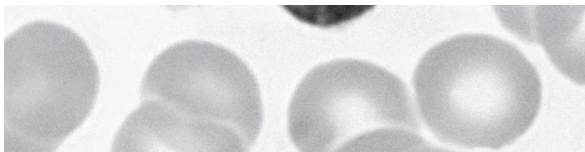
Question 16

0610/23 J25 ■ Q16 ■ 1 mark

16 The photomicrograph shows some blood cells.



Question 16



Which row shows the name and function of the cell labelled X?

	name	function
A	lymphocyte	engulfs pathogens
B	lymphocyte	produces antibodies
C	phagocyte	engulfs pathogens

Question 16

D	phagocyte	produces antibodies
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Solution 16

Answer: **C**

Why

- A lymphocyte has a very large round nucleus almost filling the cell.
- It makes antibodies against a specific antigen.
- It is the phagocytes – neutrophils – that engulf pathogens instead.

Question 2

0610/42 J25 ■ Q2 ■ 14 marks

2 Fig. 2.1 is a photomicrograph of human blood.

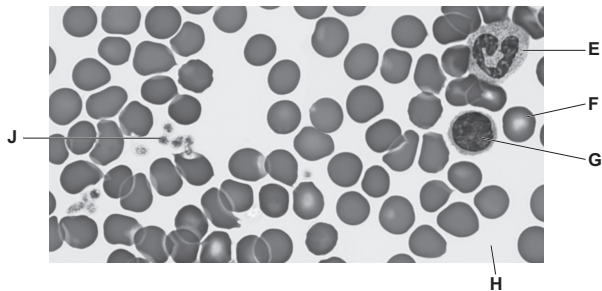


Fig. 2.1

Question 2

(a) Use the information in Fig. 2.1 to complete Table 2.1.

Table. 2.1

component of blood	letter from Fig. 2.1	function
red blood cell		
		production of antibodies
	H	

Question 2

		phagocytosis
platelet	J	

[5]

(b) Some diseases are transmissible.

(i) State the name of a pathogen that is transmitted by direct contact with blood.

Question 2

(ii) State **two** ways that a pathogen can be transmitted **indirectly**.

Question 2

Question 2

[2]

(c) Describe the role of antibodies in the defence against pathogens.

Question 2

(d) Explain how active immunity differs from passive immunity.

Question 2

[Total: 14]

Solution 2

(a) Mark scheme

- component of
- blood
- letter from
- Fig. 2.1
- function
- red blood cell
- F
- transport / carry / AW, oxygen

Solution 2

- lymphocyte
- G
- production of antibodies
- plasma
- H
- transport / carries / contains
- / holds / AW, (blood)
- cells / ions / nutrients
- / hormones / proteins
- / antibodies

Solution 2

- / carbon dioxide / urea
- / waste / heat
- A solvent OR maintain, blood
- pressure / pH / osmotic balance
- phagocyte
- E
- phagocytosis
- platelet
- J
- (description of blood)

Solution 2

- clotting / prevent blood
- loss / release fibrin
- ;;;;
- 5 one mark per correct row

Solution 2

(b)(i)

Mark scheme

- HIV / human immunodeficiency (virus) / AVP ;
- 1

Solution 2

(b)(ii) Mark scheme

- any two from:
- (contaminated) surfaces / objects ;
- food ;
- water ;
- faeces / sewage ;
- soil ;
- air ;
- (named) animals / vector ;

Solution 2

- 2
- 0610/42
- May/June 2025
- Guidance

Solution 2

(c) Mark scheme

- any three from:
 - 1
 - ref. to specificity OR antibodies have complementary (shape) to,
 - antigen / pathogen ;
 - 2
 - fit / bind, to (specific) antigens ;
 - 3
 - mark / clump / immobilise / neutralise / inactivate, pathogens

Solution 2

- / toxins ;
- 4
- (for) destruction of pathogens / phagocytosis / described ;
- 5
- AVP ;
- 3
- e.g. prevents pathogens entering a cell

Solution 2

(d) Mark scheme

- any three from:
- active immunity:
- 1
- (gained) as a result of infection / vaccination ;
- 2
- antibodies are produced (by the body / lymphocytes / memory
- cells) ;
- 3

Solution 2

- produces memory cells / ref to secondary immune response ;
- 4
- long-term / permanent ;
- 5
- slower response ;
- 3 A ora throughout for passive immunity
- MP1 A passive immunity (gained from)
- antibodies, in breast milk / through placenta / by
- injection
- MP2 A in passive immunity antibodies are not

Solution 2

- acquired from their own immune system