

30 Which statement correctly compares blood plasma and tissue fluid in a healthy person?

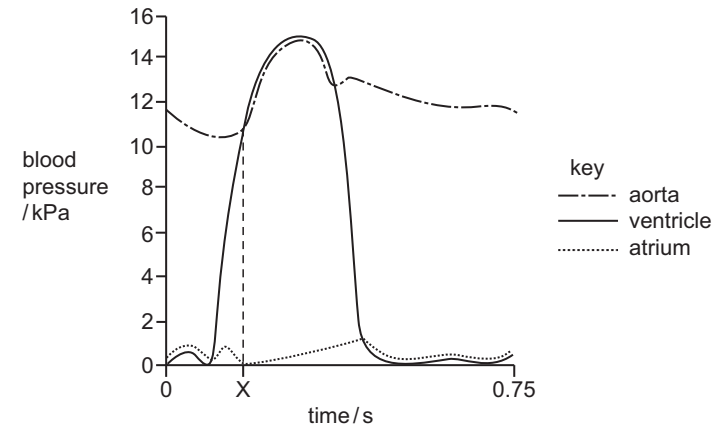
- A Blood plasma contains more protein than tissue fluid.
- B Both blood plasma and tissue fluid contain red blood cells.
- C Tissue fluid contains white blood cells whereas blood plasma does **not** contain lymphocytes.
- D Tissue fluid is formed from blood plasma and is **not** returned to blood plasma.

31 The body maintains an average normal blood pH of 7.4.

Which row describes the conditions that would increase the dissociation rate of haemoglobin the most during periods of intense exercise?

	blood pH	blood CO ₂ partial pressure/kPa
A	7.2	5.6
B	7.2	9.5
C	7.6	5.6
D	7.6	9.5

32 The graph shows changes in blood pressure during one cardiac cycle.



What is happening at time X?

	aortic semilunar valve	atrium
A	closing	emptying
B	closing	filling
C	opening	emptying
D	opening	filling

33 How many times must a carbon dioxide molecule pass through a cell surface membrane to travel from the tissue fluid into the blood plasma?

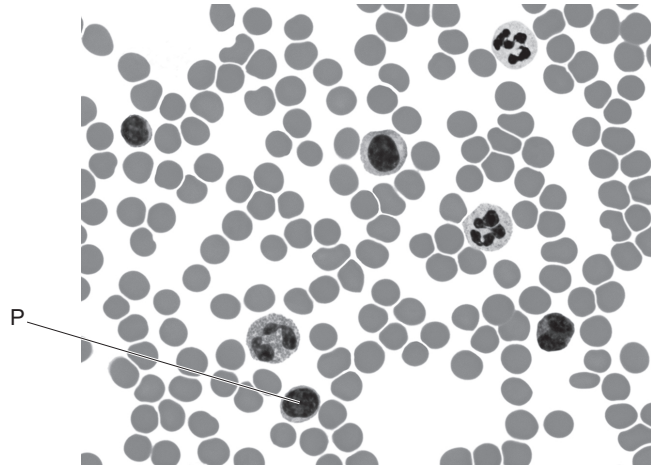
(Assume there are no pores between the cells the carbon dioxide molecule must pass through.)

- A 1 B 2 C 3 D 4

32 Which blood vessel carries blood with the lowest pressure?

- A aorta
- B pulmonary artery
- C pulmonary vein
- D vena cava

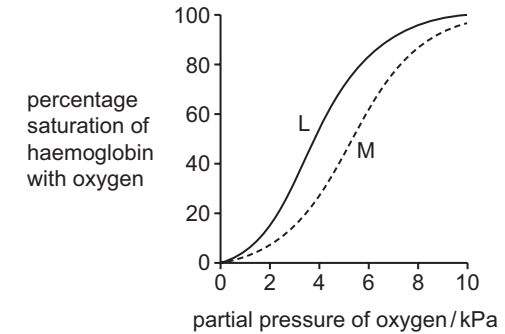
33 The photomicrograph shows cells found in mammalian blood.



What is cell P?

- A** lymphocyte
- B** monocyte
- C** neutrophil
- D** red blood cell

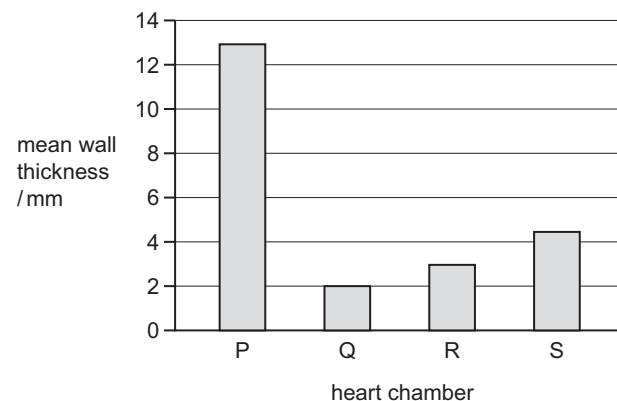
34 The diagram shows the Bohr shift in actively respiring cells.



What causes the shift from L to M?

- A** Carbonic acid dissociates to release protons that bind to oxyhaemoglobin, affecting the conformation of haemoglobin to reduce its affinity for oxygen.
- B** Hydrogencarbonate ions produced by carbonic anhydrase alter the charge of oxyhaemoglobin, reducing its ability to bind oxygen.
- C** Hydrogen ions combine with chloride ions in tissue fluid to produce hydrochloric acid, distorting oxyhaemoglobin and causing it to lose bound oxygen.
- D** A low concentration of oxygen in actively respiring cells causes oxyhaemoglobin to release oxygen more quickly down the concentration gradient.

35 The bar chart shows the mean thickness of the walls of the main chambers in a mammalian heart.



Which row correctly identifies the heart chambers?

	right atrium	left atrium	right ventricle	left ventricle
A	R	Q	S	P
B	Q	S	R	P
C	R	Q	P	S
D	Q	R	S	P

31 The table shows the comparison of blood pressure in three main blood vessels during diastole.

	vessel 1	vessel 2	vessel 3
blood pressure in the vessel during diastole	low	very high	high

Which row identifies the three blood vessels?

	vessel 1	vessel 2	vessel 3
A	pulmonary vein	pulmonary artery	aorta
B	vena cava	aorta	pulmonary vein
C	pulmonary vein	aorta	pulmonary artery
D	pulmonary artery	pulmonary vein	vena cava

32 Red blood cells may contain a molecule known as 2,3-bisphosphoglycerate (2,3-BPG).

When 2,3-BPG binds to haemoglobin, a higher partial pressure of oxygen is needed to bring about 50% saturation of haemoglobin with oxygen.

Which statements about the effect of 2,3-BPG are correct?

- 1 2,3-BPG in red blood cells causes the oxygen dissociation curve to shift to the right.
- 2 The binding of 2,3-BPG to haemoglobin reduces the Bohr effect.
- 3 The binding of 2,3-BPG to haemoglobin lowers the affinity of the haemoglobin for oxygen.

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only