Biology Worksheet

Chapter 8: Transport in Humans

Name: _____ ( ) Class : _____ Date : _____

Section A Multiple Choice Questions

Choose the **most appropriate** answer and write it in the corresponding box below.

Qsn	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Ans										
Qsn	**11**	**12**	**13**							
Ans										

1 What is the shortest route that can be taken by the blood travelling from a leg to an arm in the human body?

A leg → heart → lungs → heart → arm
B leg → heart → lungs → liver → arm
C leg → liver → heart → lungs → arm
D leg → liver → stomach → heart → arm

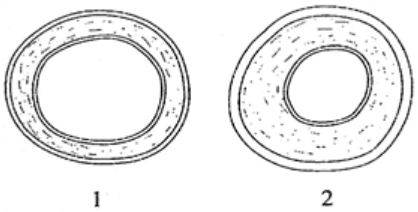
2 The table below lists the characteristics of the blood found in one blood vessel in the circulation of a mammal.

oxygen concentration	carbon dioxide concentration	blood pressure
high	low	high

Which blood vessel, **A**, **B**, **C** or **D**, contains blood with these characteristics?

A aorta
B hepatic portal vein
C vena cava
D pulmonary vein

3 The diagrams show sections through two types of blood vessel.



Which vessel has valves present and which carries blood under the highest pressure?

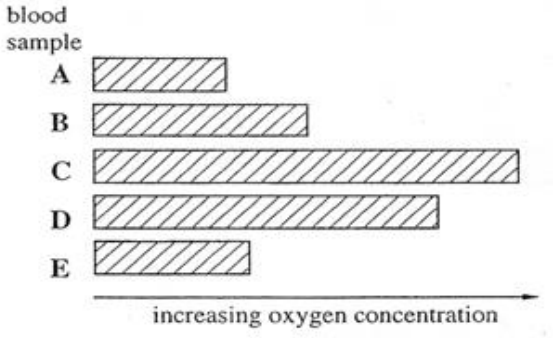
	valves present	blood under highest pressure
A	1	1
B	1	2
C	2	1
D	2	2

4 After vigorous muscular exercise, which blood vessel contains many more hydrogencarbonate ions in the plasma?

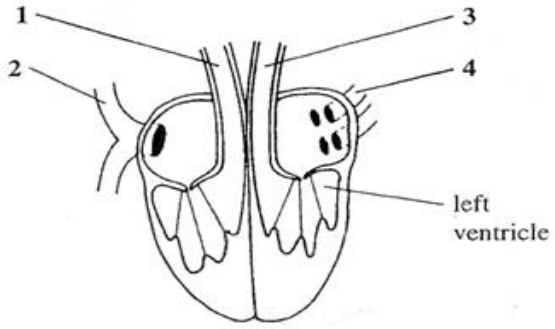
A aorta
B hepatic artery
C pulmonary vein
D vena cava

5 The bar chart shows the concentration of oxygen in blood sampled at five places in the circulatory system of a mammal.

Which blood sample was taken from a pulmonary vein?



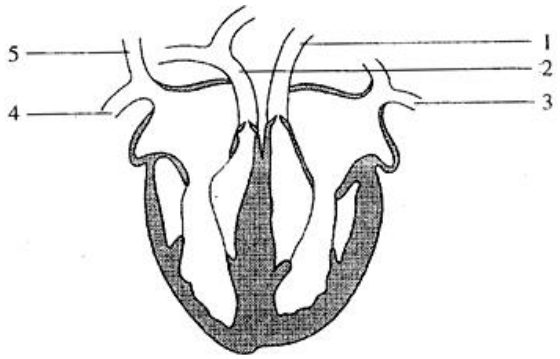
6 The diagram shows a vertical section through the heart of a mammal.



What are the numbered blood vessels?

	aorta	pulmonary artery	pulmonary vein	vena cava
A	1	2	3	4
B	1	3	4	2
C	2	4	2	1
D	3	1	4	2

7 The diagram shows a section through the heart.



Which numbered blood vessels carry oxygenated blood?

A 1 only
B 2 only
C 1 and 3 only
D 4 and 5 only

8 Blood samples from three veins in the body were tested for the concentration of oxygen, carbon dioxide and urea. The results, in arbitrary units, are shown in the table.

vein	oxygen concentration	carbon dioxide concentration	urea concentration
1	40	48	1.5
2	40	48	7.5
3	90	40	4.0

Which veins were sampled?

	hepatic vein	pulmonary vein	renal vein
A	1	2	3
B	2	3	1
C	3	1	2
D	3	2	1

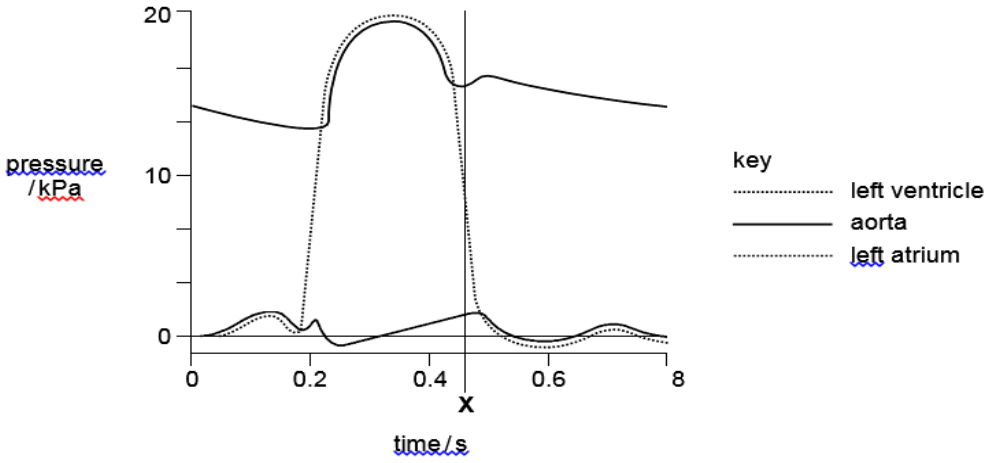
9 Some of the components of the blood of a mammal are listed.

1 antibodies
2 fibrinogen
3 platelets
4 white blood cells

Which two components are involved in attacking bacteria and other organisms that cause disease?

A 1 and 2
B 1 and 4
C 2 and 3
D 3 and 4

10 The diagram shows the pressures in the left side of the heart during one heartbeat.



Which valves are open and which are closed at the time marked X?

	bicuspid	semi-lunar
A	closed	closed
B	closed	open
C	open	closed
D	open	open

11 Which row shows the blood vessels carrying blood to and from the organs listed?

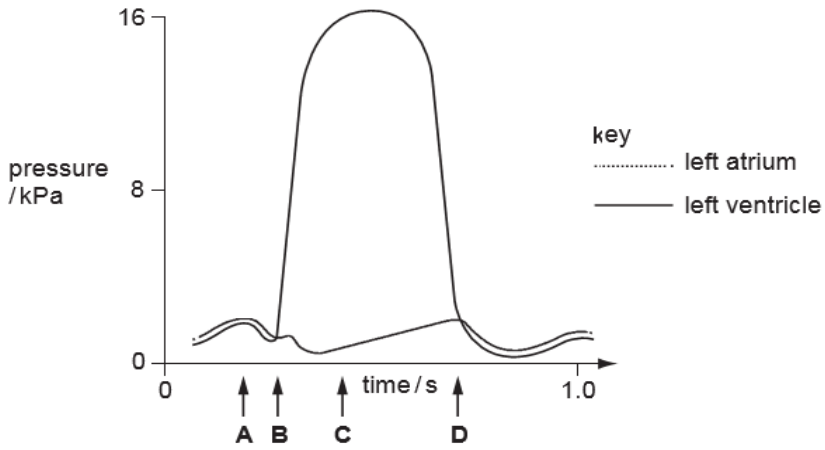
	blood vessel carrying blood to the organ	organ	blood vessel carrying blood from the organ
A	aorta	heart	pulmonary vein
B	hepatic artery	liver	hepatic portal vein
C	pulmonary artery	lung	pulmonary vein
D	renal vein	kidney	renal artery

12 The diagram shows a section through part of a vein.

What could be the first organs found in the directions 1 and 2?

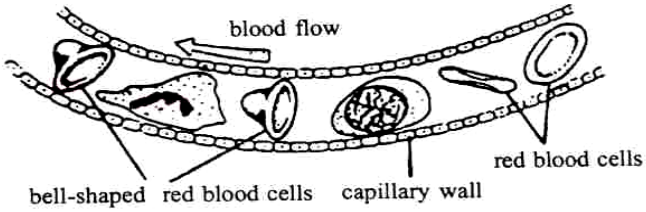
	1	2
A	heart	brain
B	intestine	liver
C	kidney	heart
D	lung	heart

13 The graph shows the pressure changes in the left atrium and the left ventricle while the heart is beating.
When does the atrio-ventricular (bicuspid) valve close?



Section B Structured Questions

1 The figure is a diagram of a capillary showing blood flow and blood cells.



(a) State the main function of red blood cells.

_____

(b) Red blood cells change their shape as they pass along the capillaries. They assume the 'bell' shape shown in the figure. Suggest **two** ways in which this change in shape is an advantage.

_____

_____

(c) Name the other types of cells in the blood of the capillary. State the function of each type.

(i) **Name** _____
(indicate this cell on the figure by labeling the cell with the letter **X**)

Function _____

(ii) **Name** _____
(indicate this cell on the figure by labeling the cell with the letter **Y**)

Function _____

2 Figure **A** shows a heart.

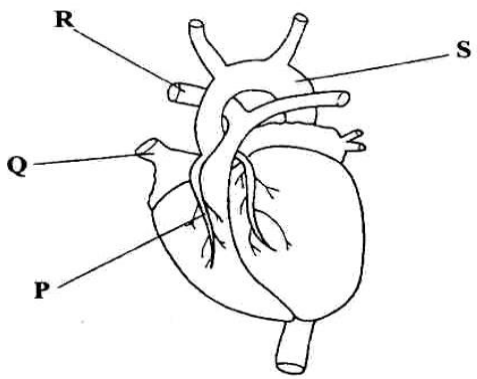


Fig. A

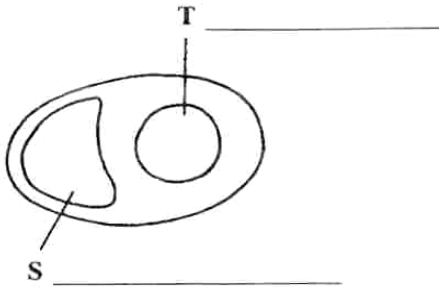
(a) Label the structures **P, Q,** and **R**.

P _____ **R** _____

Q _____

Figure **B** is a transverse section through the same heart.

Fig. B



(b) (i) Label the regions **S** and **T.**

(ii) Explain why the wall surrounding **T** is thicker than the wall surrounding **S.**

_____

_____

_____

(iii) **Draw a line through** Fig **A** to indicate the position from which the section in Fig **B** was taken.

(c) Complete the table to show whether the blood in vessels **P, Q, R** and **S** in Fig. **A** is oxygenated or de-oxygenated, and under high or low pressure.

	Blood oxygenated	Blood under high pressure
P		
Q		
R		
S		

(c) (i) State **two** substances in food that are believed to cause heart disease.

1. _____

2. _____

(ii) State **two** other factors that are **possible** causes of heart disease.

1. _____

2. _____

When artery **P** becomes blocked, it is sometimes replaced, during an operation, with a vein taken from another part of the patient's body.

(d) (i) When the vein is sewn into place, why must great care be taken to ensure that it is the correct way round?

_____

_____

(ii) Suggest **one advantage** and **one disadvantage** of using the patient's own vein rather than an artery transplanted from another person.

Advantage _____

Disadvantage _____

3 Long insoluble threads are formed as the blood clots over a cut in the skin.
Fig 3 shows how the insoluble threads are formed.

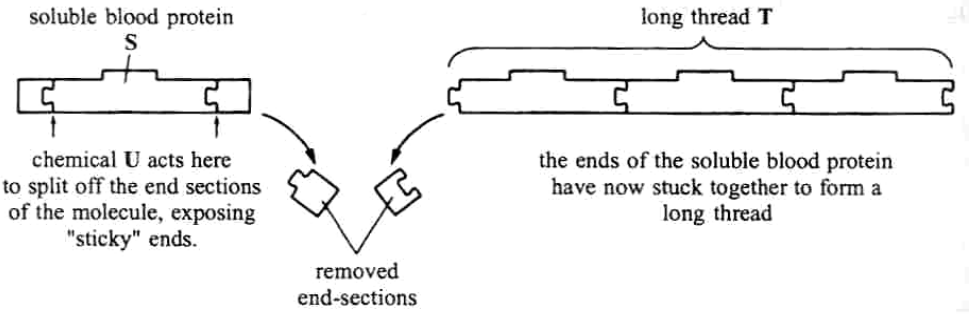


Fig. 3

(a) (i) Name the soluble protein **S.** _____

(ii) Name the long insoluble thread **T.** _____

4 At an altitude of 4000 metres, the pressure which forces oxygen into blood is reduced by approximately 33%. A person moves from sea level to live at this altitude for 24 days. Fig. 4 shows the effect of the reduced oxygen availability on the number of red blood cells in the person's blood.

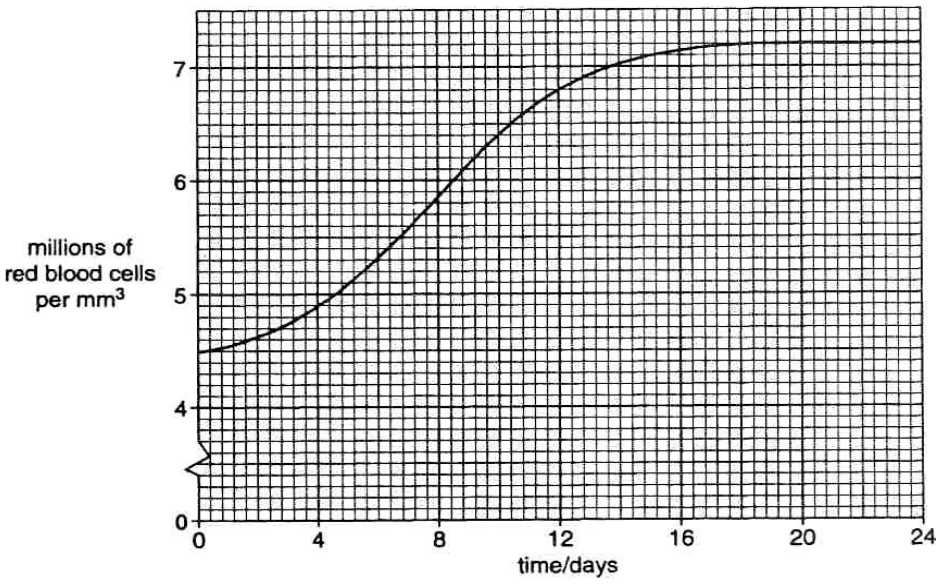


Fig. 4

(a) (i) Calculate the percentage increase in the number of red blood cells during the 24 days. Show your working.

% = _____

(ii) Suggest how this change in number of red blood cells adapts the person to conditions at 4000 m.

_____

_____

_____

In addition to the change in number of red blood cells, the person's total blood volume increases, as does the volume of blood pumped by the heart during each heartbeat.

(b) Suggest how training at 4000 m could improve an athlete's performance at sea level.

_____

_____

_____

_____

5 Fig 5 shows a section through a diseased blood vessel of a middle-aged person.

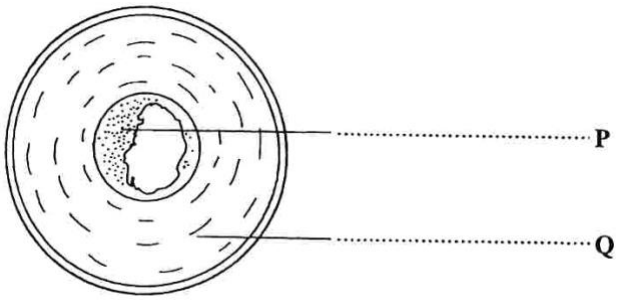


Fig. 5

(a) What type of blood vessel is shown?

_____

(b) On the diagram, name the parts labeled **P** and **Q**.

(c) Describe the possible effects of **P** on the person's health.

_____

_____

_____

(d) Explain how the person's diet over the previous twenty years may have caused this blood vessel to be diseased.

_____

_____

_____

6 Three samples of blood X, Y and Z were tested for their blood group with serum from blood group A and group B. The results were as shown below, using red blood cells from X, Y, Z and recording the clumping of the cells or no effect.

	Blood X	Blood Y	Blood Z
Serum from group A	No effect	Clumping	No effect
Serum from group B	Clumping	Clumping	No effect

(a) To which blood group does each sample X, Y, Z belong?

X is group _____

Y is group _____

Z is group _____

(b) Clumping of red blood cells is caused by an antigen-antibody reaction.

(i) Where is the antigen located? _____

(ii) Where is the antibody located? _____

(c) For a blood transfusion, which one of them or none of them is a

(i) universal donor? _____

(ii) universal recipient? _____

(d) What do you understand by compatibility of blood group?

_____

_____

_____

(e) Into which part of the circulatory system is blood introduced during a transfusion?

_____