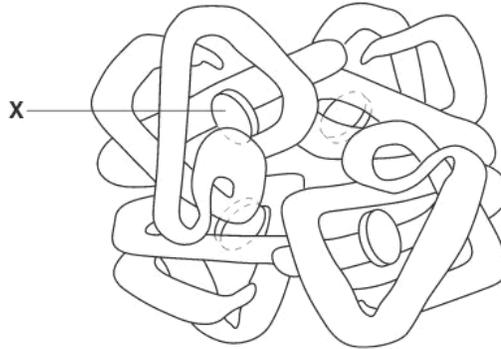


**Q1.**

5 Haemoglobin is a globular protein with quaternary structure.

Fig. 5.1 is a diagram of the haemoglobin molecule.



**Fig. 5.1**

(a) With reference to Fig. 5.1,

(i) name **X** and state its function;

.....  
.....[2]

(ii) explain why haemoglobin is described as a *globular protein* with *quaternary structure*.

.....  
.....  
.....[2]

(b) Explain why people who have a deficiency of iron in their diet are often lacking in energy and feel tired.

.....  
.....  
.....  
.....[3]

Use

Fig. 5.2 shows the oxygen dissociation curves for myoglobin, **M**, and haemoglobin, **H**.

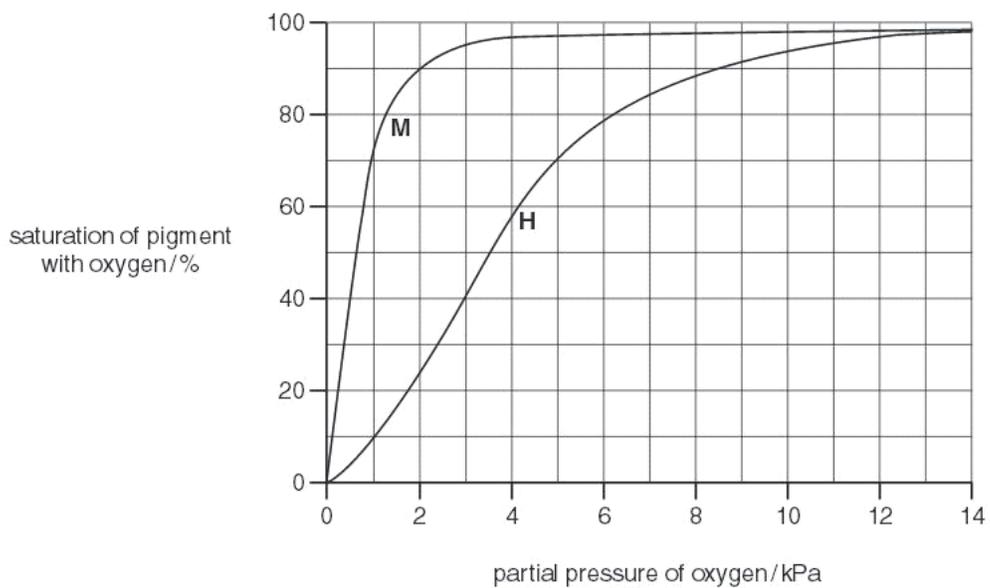


Fig. 5.2

(c) State the tissue where myoglobin is found.  
.....[1]

(d) With reference to Fig. 5.2,  
(i) state the percentage saturation of myoglobin and haemoglobin when the partial pressure of oxygen is 2 kPa;  
myoglobin .....  
haemoglobin .....[1]

(ii) explain the significance of the difference in percentage saturation that you have shown in (i).  
.....  
.....  
.....  
.....  
.....[3]

(e) When a person exercises vigorously, the partial pressure of carbon dioxide in the blood increases.

Draw on Fig. 5.2 a dissociation curve for haemoglobin when the partial pressure of carbon dioxide has increased. [1]

[Total : 13]

## Q2.

1 Fig. 1.1 is a vertical section of the heart to show the regions concerned with initiating and conducting impulses.

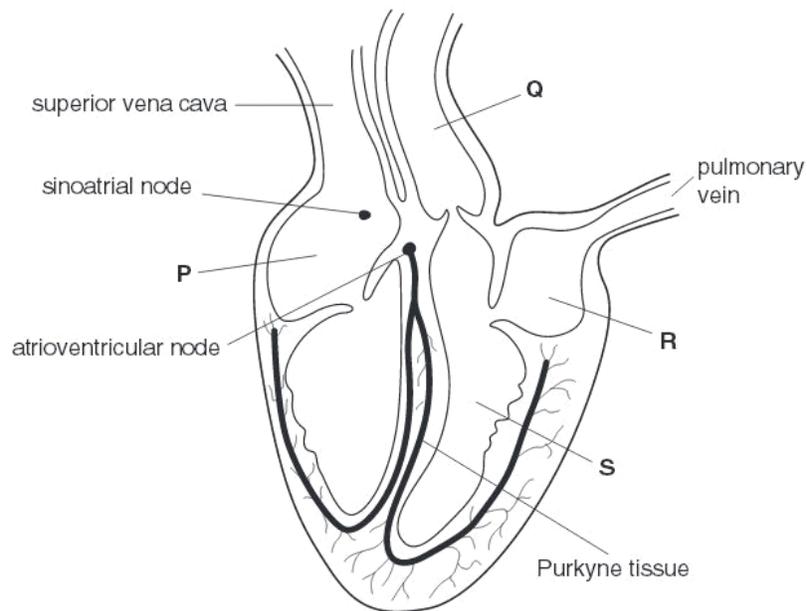


Fig. 1.1

(a) Name chamber **P** and blood vessel **Q**.

**P** .....

**Q** .....[2]

(b) Explain why the wall of chamber **S** is much thicker than the wall of chamber **R**.

.....

.....

.....

.....

.....[2]

(c) Describe how the following three structures shown on Fig. 1.1 initiate and coordinate the contraction of the heart:

- sinoatrial node (SAN)
- atrioventricular node (AVN)
- Purkyne tissue.

.....

.....

.....

.....

.....

.....

.....

.....[4]

Use



(d) Explain why the red blood cell count is much higher in the person who lived at high altitude.

.....  
.....  
.....  
.....  
.....

[2]

[Total:11]

**Q4.**

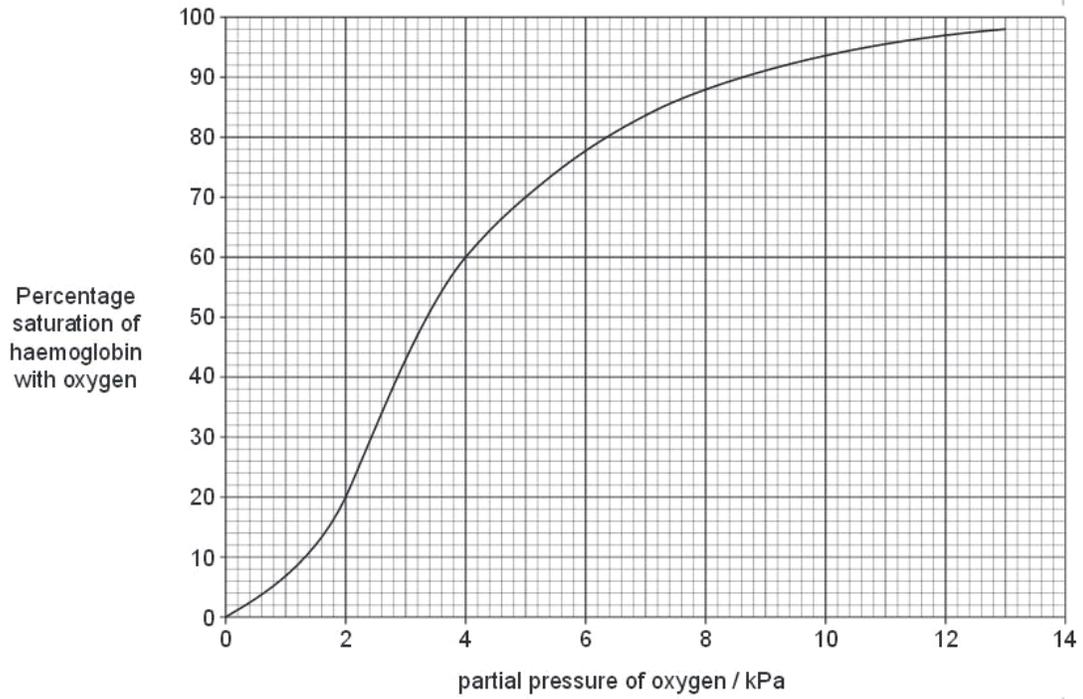
3 (a) As blood passes through the capillaries in the lungs it becomes oxygenated.

Explain how the structure of haemoglobin aids the uptake of oxygen in the lungs.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

[4]

Fig. 3.1 shows the dissociation curve of adult haemoglobin.



(b) Use the information given in Fig. 3.1 to complete the table below.

part of the circulation	partial pressure of oxygen / kPa	percentage saturation of haemoglobin
capillaries in the lungs		98
capillaries in muscle tissue at rest		70
capillaries in muscle tissue during strenuous exercise	2.0	

[3]

- (c) During exercise the concentration of carbon dioxide in muscle tissue increases. This stimulates an increase in the release of oxygen from the blood.

Explain how carbon dioxide stimulates the release of oxygen from the blood.

.....

.....

.....

.....

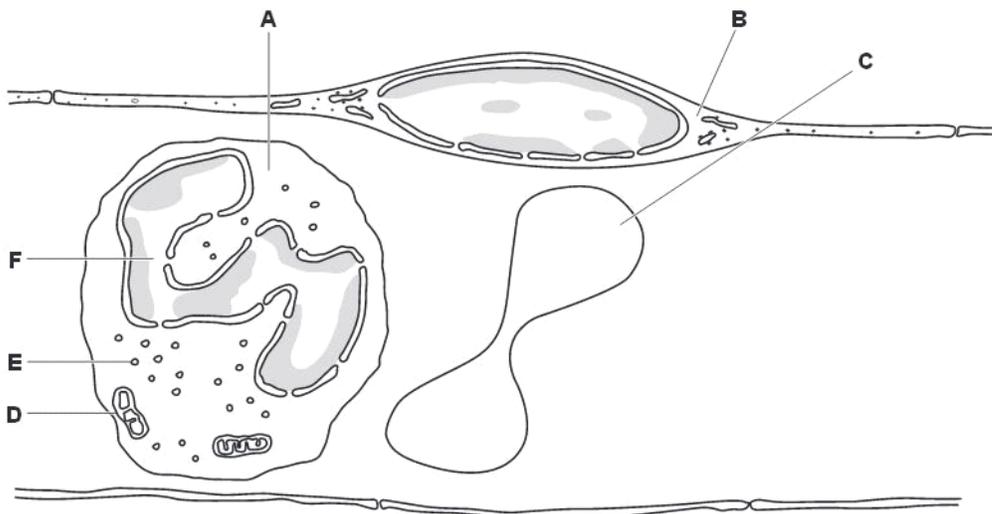
.....

..... [3]

[Total: 10]

**Q5.**

- 1 Fig. 1.1 is a drawing made from an electron micrograph of a longitudinal section of a capillary in muscle tissue.



**Fig. 1.1**

8000

(a) Complete the table below using the information in Fig. 1.1 to help you.

	cell A	cell B	cell C
name of cell			red blood cell
function of cell	ingest bacteria	permit exchange of gases	
diameter / $\mu\text{m}$		20	7

[4]

(b) Name the organelles **D**, **E** and **F**.

**D** .....

**E** .....

**F** .....[3]

(c) Explain how oxygen and glucose move from the blood inside the capillary to the tissue fluid in the muscle.

oxygen .....

.....

.....

glucose .....

.....

.....[3]

(d) Describe how the **structure** of the **wall** of a vein differs from that of a capillary.

.....

.....

.....

.....

.....

.....[3]

[Total: 13]



- (c) Some components of tobacco smoke are absorbed into the blood stream and affect the cardiovascular system.

E

Describe the effects of nicotine and carbon monoxide on the cardiovascular system.

nicotine .....

.....

.....

.....

carbon monoxide .....

.....

.....

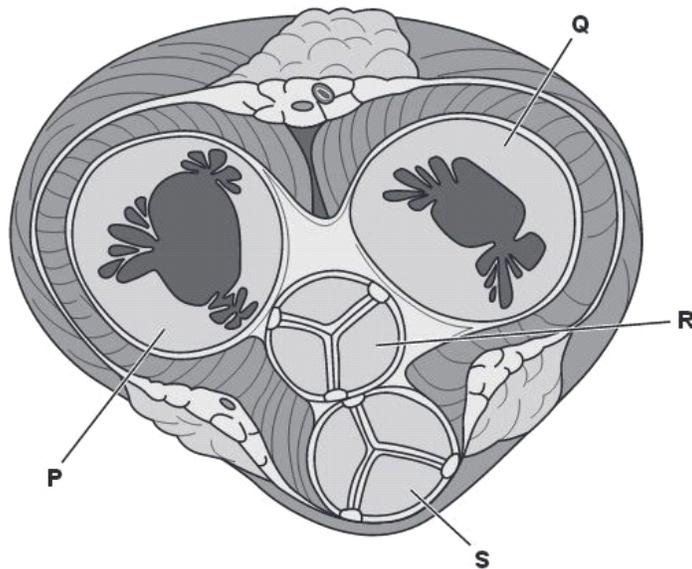
..... [4]

[Total: 11]

**Q7.**

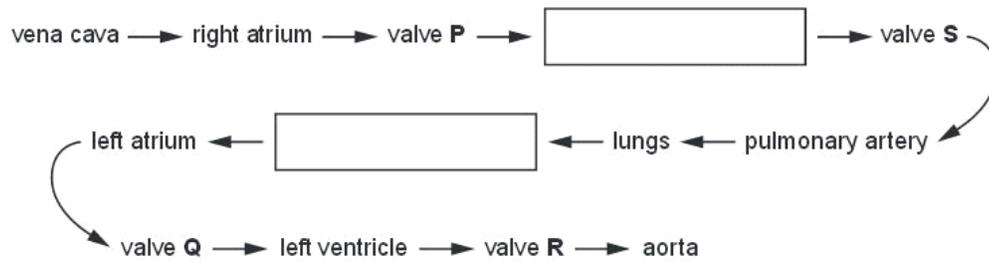
- 3 (a) Fig. 3.1 shows a cross-section of the heart at the level of the valves.

For  
Examine  
Use



**Fig. 3.1**

(i) Complete the following flow chart to show the pathway of blood through the heart.



[2]

(ii) Explain how the valves P and Q ensure one-way flow of blood through the heart.

.....  
.....  
.....  
..... [2]

(b) The cardiac cycle describes the events that occur during one heart beat.

Fig. 3.2 shows the changes in blood pressure that occur within the left atrium, left ventricle and aorta during one heart beat.

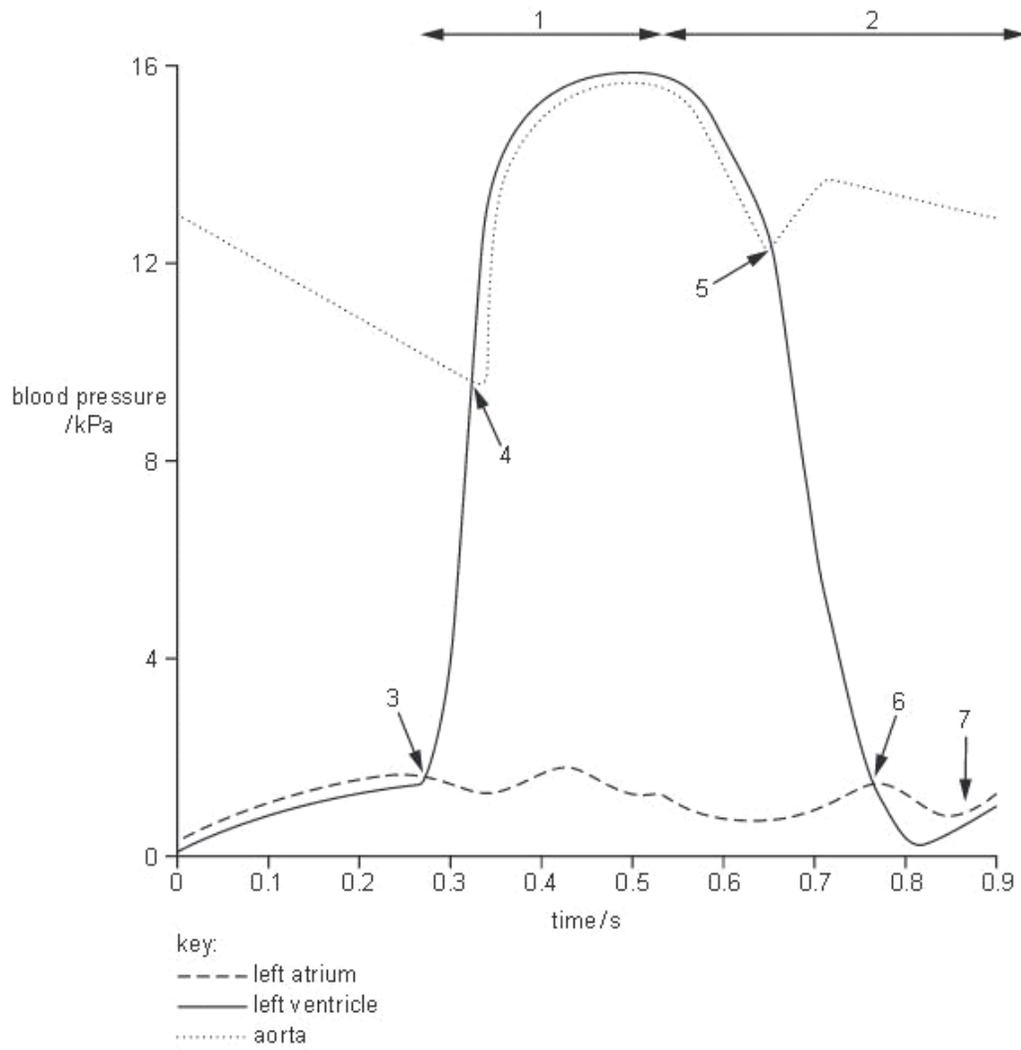


Fig. 3.2



2 Fig. 2.1 is a diagram of a vertical section through a healthy mammalian heart.

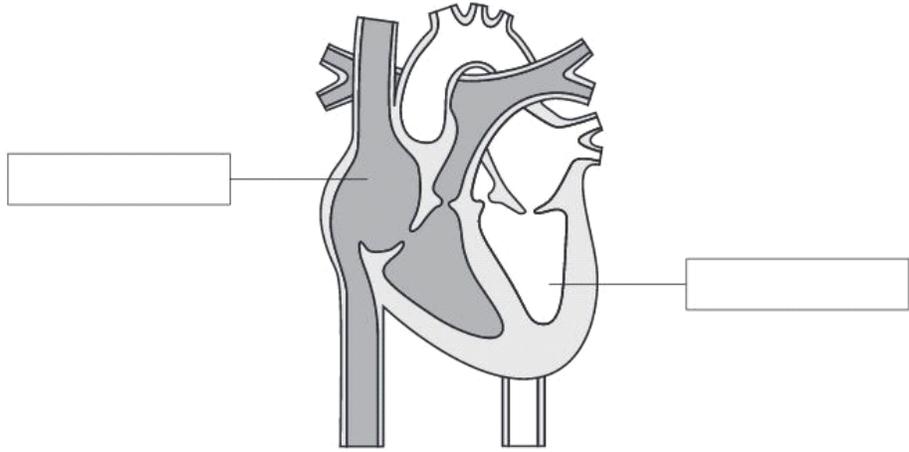


Fig. 2.1

(a) (i) Label the **two** chambers of the heart by writing in the boxes provided on Fig. 2.1. [1]

(ii) State two ways in which the **composition** of blood entering the right atrium is different to blood entering the left atrium.

1. ....

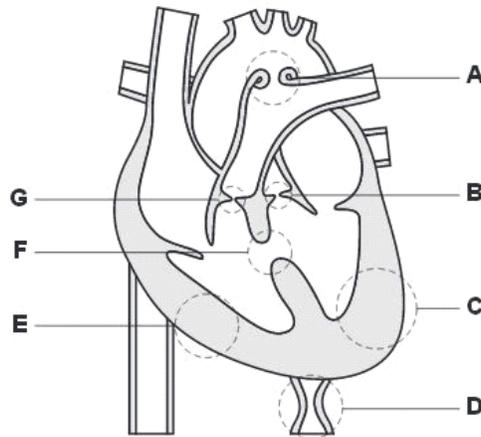
.....

2. ....

.....[2]

Some people are born with structural defects of the heart and its associated blood vessels. This is known as congenital heart disease. The dotted circles labelled **A** to **G** on Fig. 2.2 show some areas that are affected by different types of congenital heart disease.

Fr  
Ex am  
Uk



**Fig. 2.2**

The structural defects causing four types of congenital heart disease are described below:

- **patent ductus arteriosus** – a link between the pulmonary artery and aorta fails to close after birth
- **pulmonary stenosis** – a narrowing of the semilunar valve of the pulmonary artery
- **coarctation of the aorta** – a localised narrowing of the aorta
- **ventricular septal defect** – a hole in the septum between the ventricles.

**(b)** Match the **one** correct area from **A** to **G** on Fig. 2.2 with each of the congenital heart diseases.

The first one has been completed for you.

patent ductus arteriosus ..... **A** .....

pulmonary stenosis .....

coarctation of the aorta .....

ventricular septal defect .....

[3]

(c) Suggest and explain how the flow of blood in a person with patent ductus arteriosus differs from that of a person with a healthy heart.

.....

.....

.....

.....

.....

.....

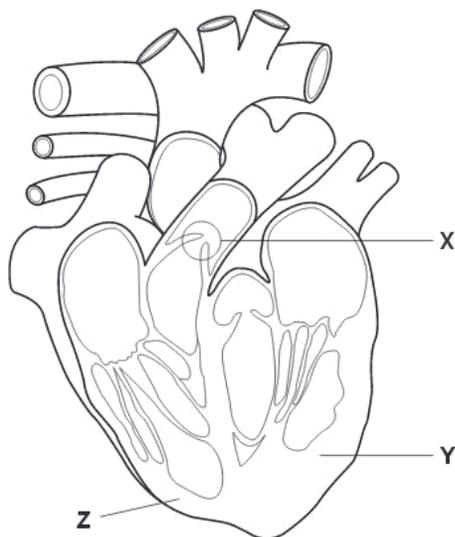
.....

[3]

[Total: 9]

**Q9.**

2 Fig. 2.1 shows a diagram of a section through a human heart.



**Fig. 2.1**

For  
Exam  
Use

(a) State the name and function of the circled structure labelled X.

*name* .....

*function* .....

.....

.....[3]

(b) Explain why the region labelled Y is thicker than the region labelled Z.

.....

.....

.....

.....

.....

.....[3]

(c) Cardiac muscle is described as myogenic as it naturally contracts and relaxes. With reference to the structures and tissues within the heart, describe how the cardiac cycle is initiated and coordinated.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....[5]

[Total: 11]

**Q10.**

2 (a) Carbon dioxide is transported in the blood in various forms.

Describe how carbon dioxide molecules reach red blood cells from respiring cells.

.....

.....

.....

..... [2]

Fig. 2.1 shows part of a capillary network and some cells of the surrounding tissue.

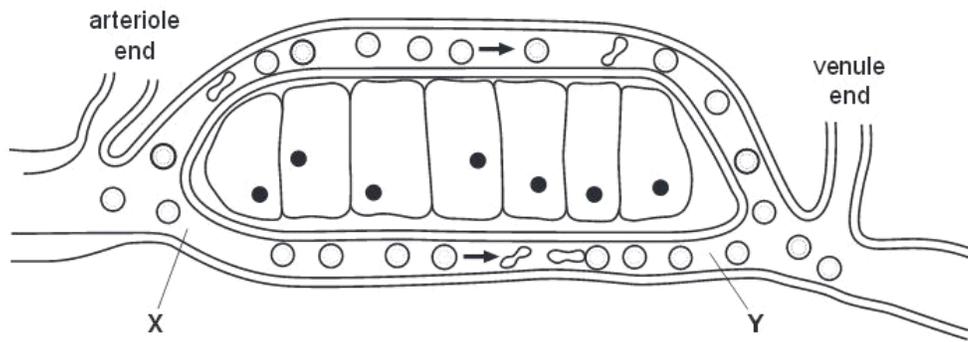


Fig. 2.1

(b) State three ways in which the blood at Y differs from the blood at X other than in the concentration of carbon dioxide.

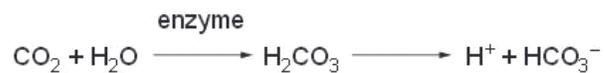
1. ....

2. ....

3. .... [3]

An enzyme in red blood cells catalyses the reaction between carbon dioxide and water as blood flows through respiring tissues.

For  
Examin  
Use



(c) (i) Name the enzyme that catalyses this reaction.

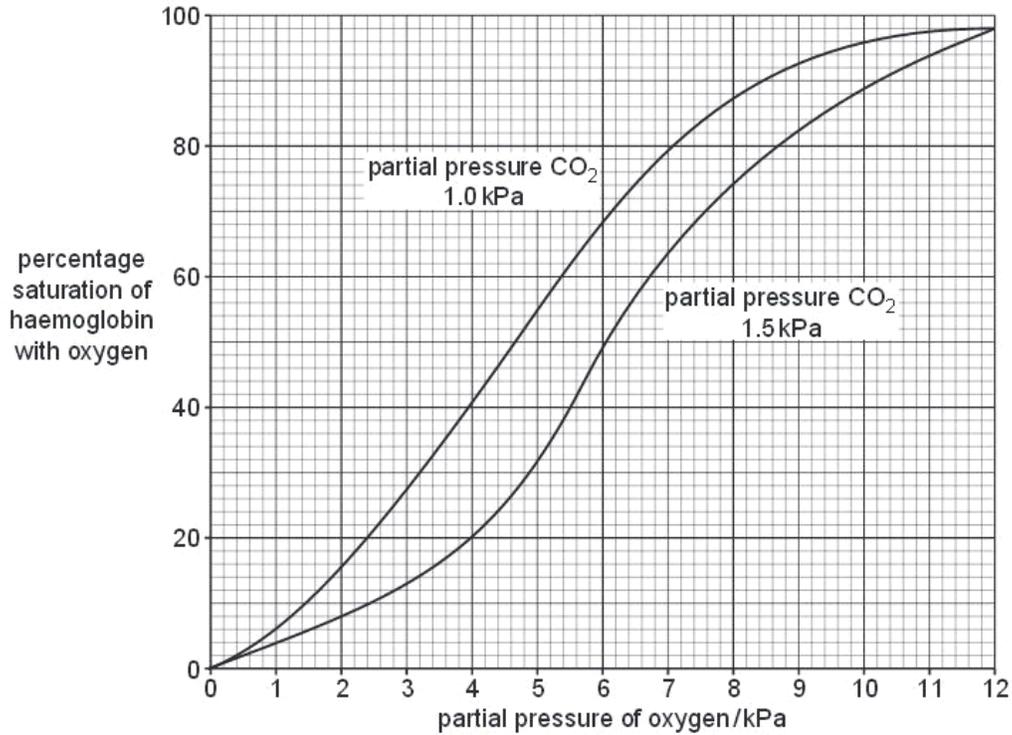
.....[1]

(ii) Explain the significance of this reaction in the transport of carbon dioxide.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....[3]

(d) Fig. 2.2 shows the effect of increasing the carbon dioxide concentration on the oxygen haemoglobin dissociation curve.

Ex



(i) State the percentage saturation of haemoglobin with oxygen at a partial pressure of 5 kPa of oxygen when the partial pressure of carbon dioxide is:

1.0 kPa .....

1.5 kPa .....[1]

(ii) The percentage saturation of haemoglobin with oxygen **decreases** as the partial pressure of carbon dioxide increases.

Explain how this happens.

.....

.....

.....

.....[2]

(iii) Name the effect of increasing carbon dioxide concentration on the oxygen dissociation curve.

For  
Examinee  
Use

.....[1]

(iv) Explain the importance of the effect of carbon dioxide on haemoglobin as shown in Fig. 2.2.

.....  
.....  
.....  
.....  
.....  
.....  
.....[3]

[Total: 16]

**Q11.**

3 (a) Explain how the structure of red blood cells is suited to their function of transporting oxygen to body tissues.

Ex:

.....  
.....  
.....  
.....  
.....  
.....  
.....[3]

- (b)** The circulating red blood cell is metabolically active but only lives for about 120 days. During this time, some important enzymes are gradually broken down and this may contribute to the death of the cell.

Explain why the red blood cell is **not** able to replace important enzymes that have been broken down.

.....  
.....  
.....  
.....  
.....[2]

- (c)** Red blood cells are broken down by phagocytic cells in the liver and spleen. The haemoglobin is broken down into haem and globin before further processing. Some of the components of haemoglobin are re-used in the body.

**(i)** Name the mineral ion released from the breakdown of haem.

.....[1]

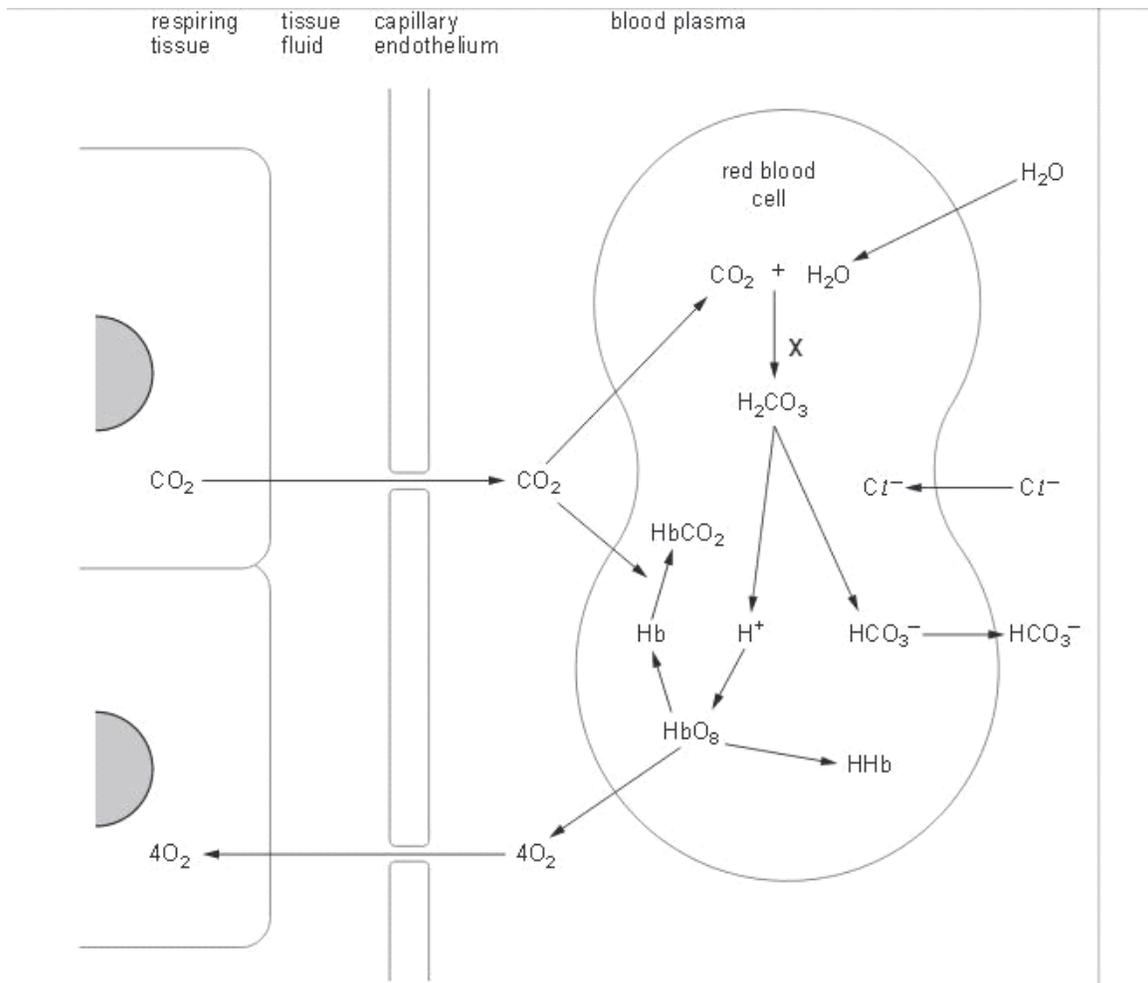
**(ii)** State the products of globin hydrolysis.

.....[1]

Haemoglobin plays an important role in carrying oxygen and carbon dioxide.

Fig. 3.1 summarises some of the events that occur as blood enters a capillary located in an area of actively respiring cells.

Ex

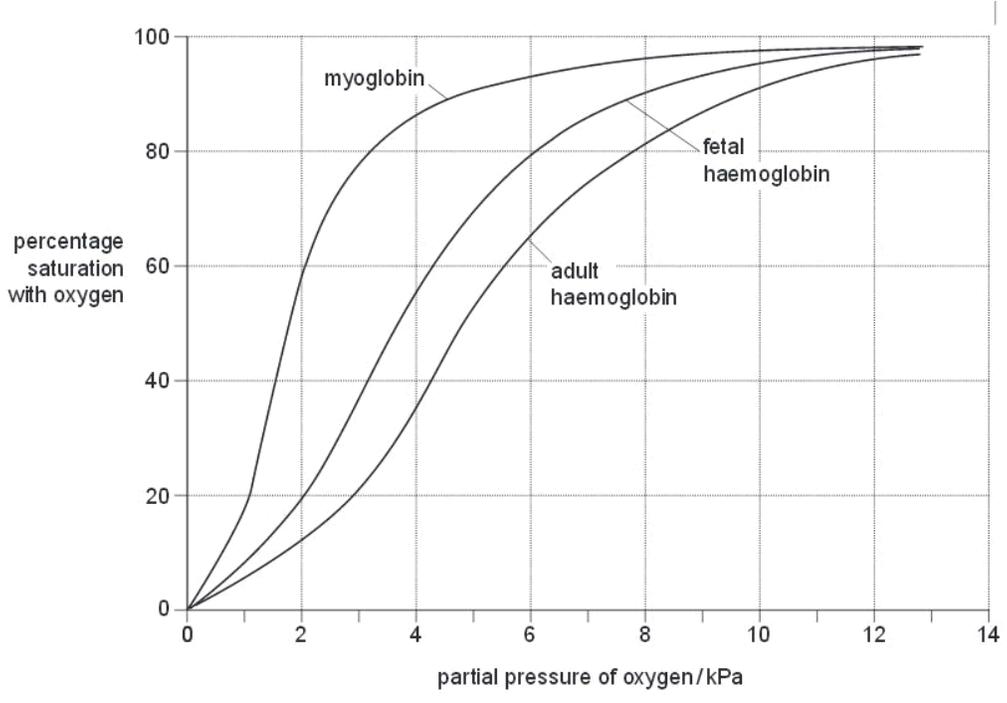


**Fig. 3.1**

**(d)** State the name of the enzyme that catalyses the reaction occurring at X.

..... [1]





(a) (i) Name the cells in which haemoglobin is found.

..... [1]

(ii) Use Fig. 4.1 to determine the percentage saturation of **myoglobin** and **adult haemoglobin** when the partial pressure of oxygen is 3 kPa.

*myoglobin* .....

*adult haemoglobin* ..... [1]

(iii) There is a large difference between the percentage saturation of myoglobin and that of adult haemoglobin at **low** partial pressures of oxygen. Suggest reasons for this.

.....  
 .....  
 .....  
 ..... [2]

For  
 Examiner's  
 Use

- (b) Fetal haemoglobin has a different oxygen binding affinity to that of adult haemoglobin, as shown in Fig. 4.1. Normally, after birth, the production of the fetal form stops and the adult form is produced.

In a rare condition known as Hereditary Persistence of Fetal Haemoglobin (HPFH), fetal haemoglobin continues to be produced well into adulthood in addition to adult haemoglobin. This condition, however, usually lacks any symptoms.

- (i) Explain, with reference to Fig. 4.1, the significance of the difference in oxygen binding affinity between fetal and adult haemoglobin.

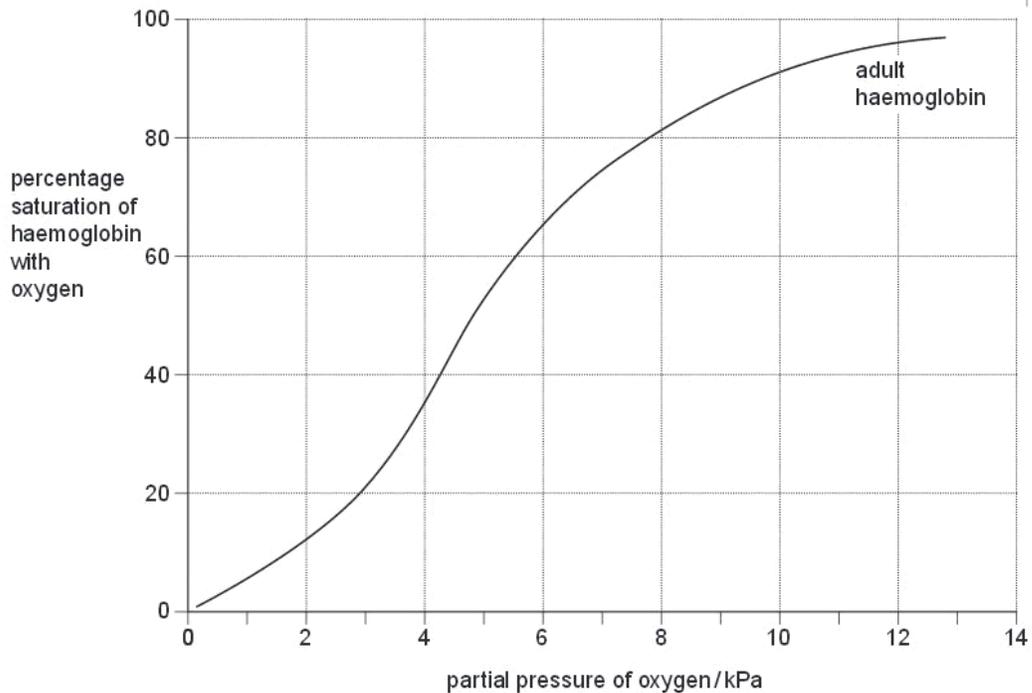
.....  
 .....  
 .....  
 ..... [2]

- (ii) Suggest why HPFH usually lacks symptoms.

.....  
 .....  
 ..... [1]

- (c) Sketch on Fig. 4.2 the dissociation curve you would expect for adult haemoglobin if the concentration of carbon dioxide is increased. [2]

*For  
 Examiner's  
 Use*



**Q13.**

- 3 Haemoglobinopathies are inherited conditions linked to the structure and function of haemoglobin. Sick cell anaemia is one of these conditions in which the transport and delivery of oxygen to tissues is less than normal.

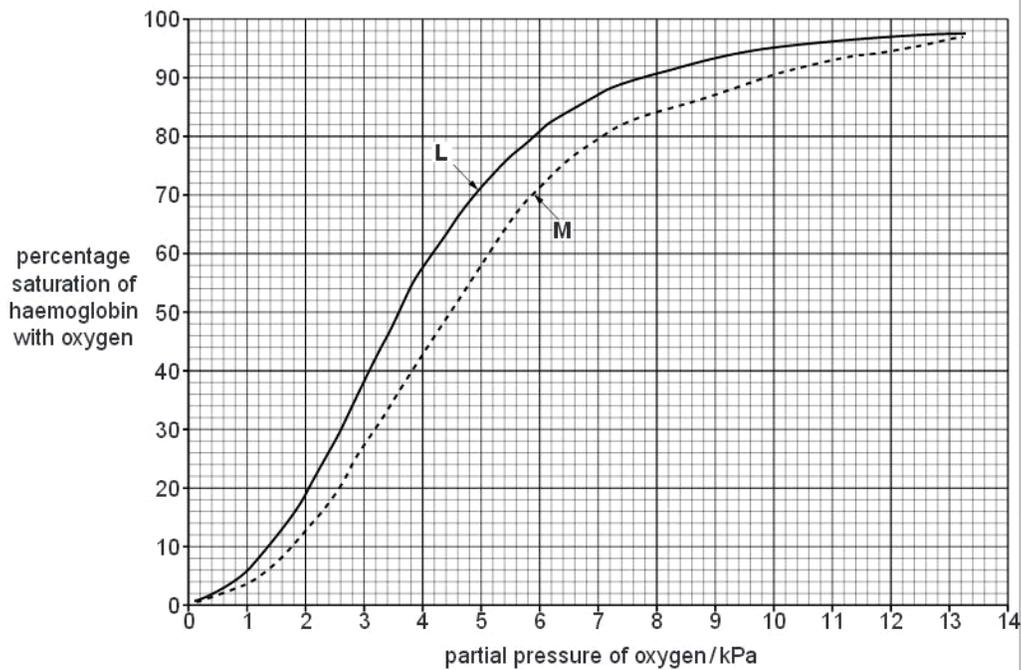
Ex  
t

An investigation was carried out to discover the effect of sickle cell anaemia on the ability of blood to carry oxygen. Blood samples were taken from two people:

- person **L** without sickle cell anaemia
- person **M** with sickle cell anaemia.

The percentage saturation of haemoglobin with oxygen was determined over a range of partial pressures of oxygen.

Fig. 3.1 shows oxygen haemoglobin dissociation curves for the two blood samples.



**Fig. 3.1**

- (a) P50 is the partial pressure of oxygen at which haemoglobin is 50% saturated with oxygen. It is taken as a measurement of the affinity of haemoglobin for oxygen.

- (i) State the P50 for the two blood samples, **L** and **M**.

**L** .....

**M** .....[1]

(ii) With reference to Fig. 3.1, describe how the dissociation curve for person M differs from the dissociation curve for person L.

.....  
.....  
.....  
.....  
.....  
.....  
..... [3]

(b) Explain the advantage of the position of the dissociation curve for people with sickle cell anaemia.

.....  
.....  
.....  
.....  
.....  
..... [3]



1 Fig. 1.1 is an electron micrograph of a cross section through a blood vessel.

Ex:

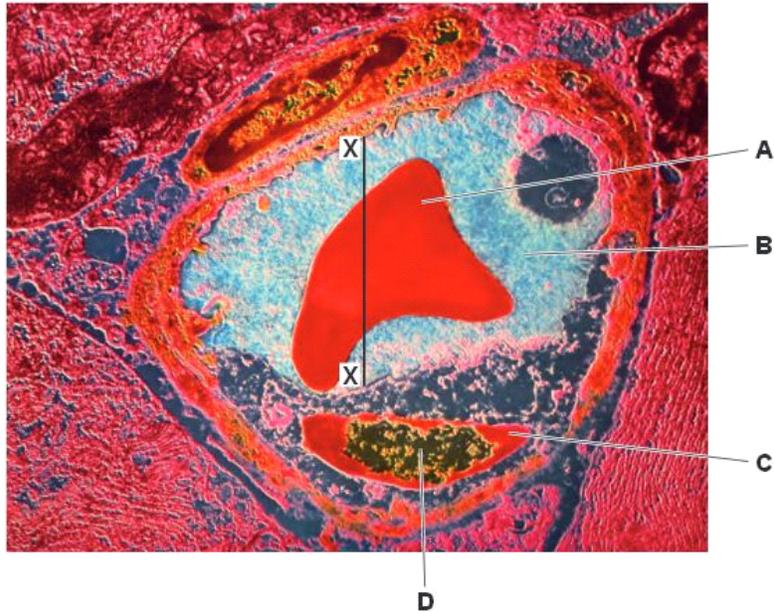


Fig. 1.1

(a) Name the type of blood vessel shown in Fig. 1.1 and describe one **visible** feature which is characteristic of this type of vessel.

*type of vessel*.....  
*characteristic feature* .....  
.....[2]

(b) Name:

(i) structure **A** .....  
(ii) the main component of substance **B**. ..... [2]

(iii) Cell **C** in Fig. 1.1 is an endothelial cell.

Name structure **D**.  
.....[1]

(c) The magnification of Fig. 1.1 is  $\times 6000$ .

Calculate the diameter of the lumen along the line X-X.

Show your working and give your answer in micrometres ( $\mu\text{m}$ ) to the nearest whole number.

F  
Exam  
U.

answer .....  $\mu\text{m}$  [2]

[Total: 7]

### Q15.

1 Capillaries are known as exchange vessels. Substances are exchanged between blood and tissue fluid as the blood flows through the capillaries.

Examine  
Use

Fig. 1.1 is an electron micrograph of a section through a capillary with two red blood cells.



(a) (i) Name the cells labelled **A** and the structure labelled **B**.

**A** .....

**B** ..... [2]

(ii) Calculate the actual distance X – Y on Fig. 1.1.

Show your working and give your answer to the nearest micrometre ( $\mu\text{m}$ ).

answer .....  $\mu\text{m}$  [2]

(iii) Explain how capillaries are adapted for their function as exchange vessels.

.....  
.....  
.....  
.....  
..... [2]

For  
Examiner:  
Use

(b) Table 1.1 shows the composition of blood, tissue fluid and lymph.

**Table 1.1**

component	blood	tissue fluid	lymph
red blood cells / cells $\text{mm}^{-3} \times 10^6$	5.1	0.0	0.0
white blood cells / cells $\text{mm}^{-3}$	9000	75	1000000
glucose / $\text{g dm}^{-3}$	800	800	775
protein / $\text{g dm}^{-3}$	71	1	26

Explain the differences between the composition of blood, tissue fluid and lymph as shown in Table 1.1, for white blood cells, glucose and protein.

*white blood cells* .....

.....

.....

.....

*glucose* .....

.....

.....

.....

*protein* .....

.....

.....

..... [5]

(c) Outline how **red blood cells** are involved in the transport of carbon dioxide.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 14]

Q16.

- 6 (a) The statements below are some of the events that occur in the initiation and control of heart action during one cardiac cycle.

Ex.

Place the events in the correct sequence, using 1 as the first event in the sequence.

event	correct sequence
Purkyne tissue conducts the wave of excitation	
atrioventricular node sends out a wave of excitation	
atria contract	
ventricles contract	
sinoatrial node sends out a wave of excitation	

[3]

- (b) The wall of the left ventricle contains more cardiac muscle than the wall of the right ventricle.

Explain the difference in the thickness of the walls of the left and right ventricles of the heart, in terms of their functions.

.....

.....

.....

.....

..... [2]

[Total: 5]

Q.17.

1 Fig. 1.1 is a photomicrograph of a transverse section of an artery and a vein from a mammal.



Fig. 1.1

(a) State three ways, **visible in Fig. 1.1**, in which the artery differs from the vein.

- 1 .....
  - 2 .....
  - 3 .....
- .....[3]

(b) The lungs contain arteries, veins and capillaries.

Explain the role of capillaries in the lungs.

.....  
.....  
.....  
.....  
.....[3]

(c) Describe the effect of tar from cigarettes on the lining of the gaseous exchange system.

.....  
.....  
.....  
.....  
.....  
.....[3]

[Total: 9]

**Q18.**

4 (a) Explain why the mammalian circulatory system is described as a closed double circulation.

.....  
 .....  
 .....  
 .....[2]

(b) Mature mammalian red blood cells have no nuclei. State **one** advantage and **one** disadvantage of this.

*advantage* .....  
 .....  
 .....  
*disadvantage* .....  
 .....  
 .....[2]

**Q19.**

5 Table 5.1 shows blood cell counts for three different people.

**Table 5.1**

	number of cells per mm <sup>3</sup> of blood		
	healthy person at sea level	healthy person acclimatised to high altitude	person with a bacterial infection
red blood cells	5 400 000	6 100 000	5 300 000
T helper lymphocytes	1 000	1 050	850
phagocytes	5 400	5 600	8 750

- (a) (i) Calculate the percentage increase in the number of red blood cells in the person acclimatised to high altitude compared with the person at sea level. Show your working and express your answer to the nearest whole number.

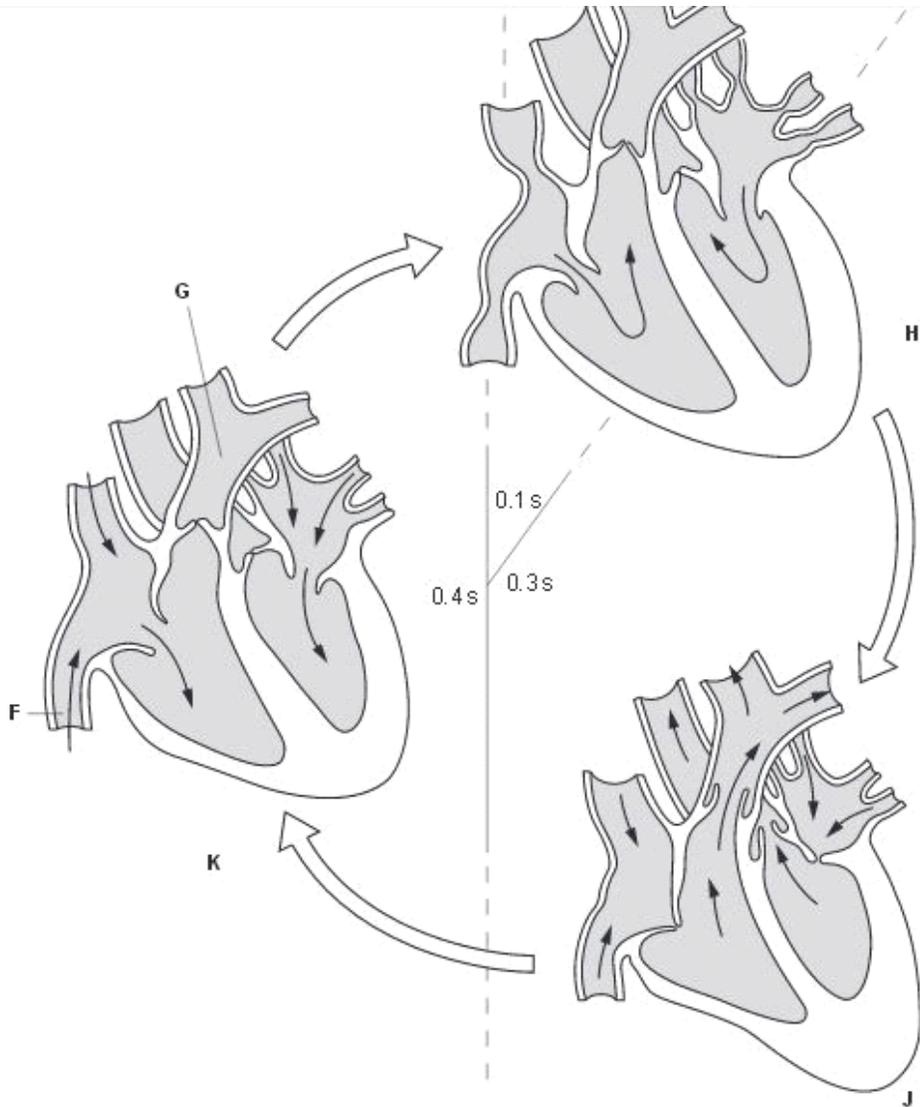
Answer = ..... [2]

- (ii) Explain the advantage of this increase in red blood cells to people who live at high altitude.

.....  
.....  
.....  
.....  
.....[2]

**Q20.**

- 6 Fig. 6.1 shows three stages in the cardiac cycle.



**Fig. 6.1**

**(a) (i)** Name the blood vessels labelled **F** and **G**.

**F** .....

**G** ..... [2]

- (ii) Fig. 6.1 indicates that one heart beat takes 0.8 second.  
State the heart rate in beats per minute.

Answer = ..... [1]

- (iii) Explain why the walls of the atria have thinner muscle than the walls of the ventricles.

.....  
 .....  
 .....  
 ..... [2]

- (b) Complete the table to show what is happening to the following parts of the **left** side of the heart at each of the stages, **H**, **J** and **K** as shown in Fig. 6.1:

- left atrium
- left ventricle
- aortic valve.

stage	left atrium	left ventricle	atrioventricular valve	aortic valve
<b>H</b>	contracts to force blood into left ventricle	..... ..... ..... .....	open	closed
<b>J</b>	..... ..... ..... .....	..... ..... ..... .....	closed	.....
<b>K</b>	..... ..... ..... .....	relaxes and fills with blood from left atrium	open	.....

[6]

[Total: 11]

**Q21.**

2 Scientists have developed a variety of ways to represent the three dimensional structure of proteins. Fig. 2.1 shows one way of representing the structure of the protein, haemoglobin.

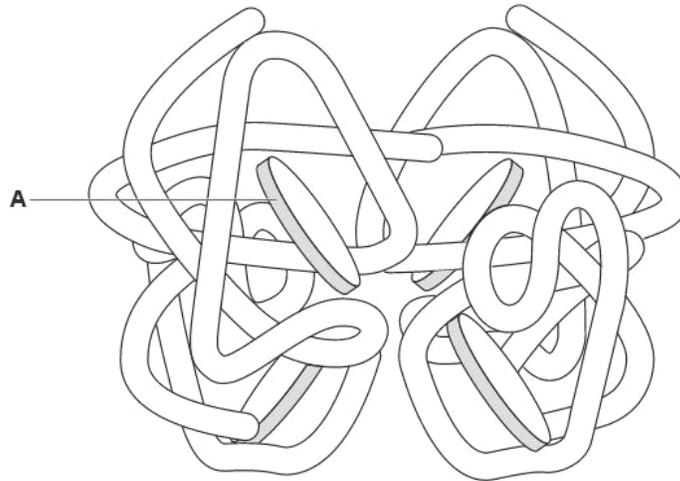


Fig. 2.1

(a) (i) Name A and state its role.

name .....

role .....

.....

.....[3]

(ii) With reference to Fig. 2.1, explain why a molecule of haemoglobin is said to show **both** tertiary structure and quaternary structure.

.....

.....

.....

.....

.....[2]

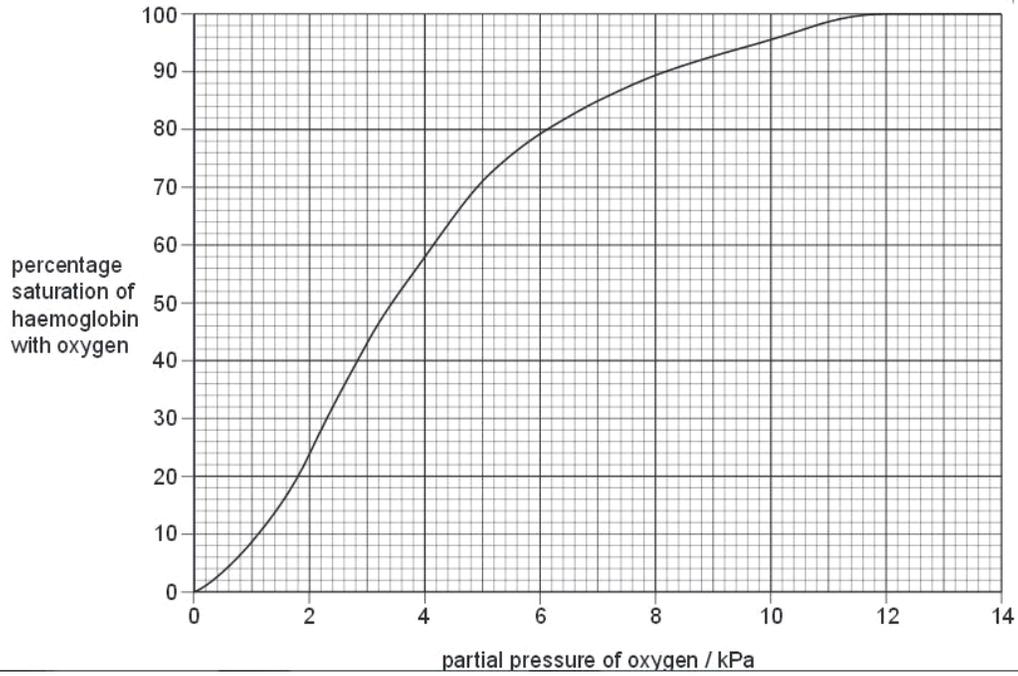
Fig. 2.2 shows the oxygen haemoglobin dissociation curve when the partial pressure of carbon dioxide is very low.

↳



(c) Sketch on Fig. 2.3 below the dissociation curve that you would expect if the concentration of carbon dioxide is increased. [2]

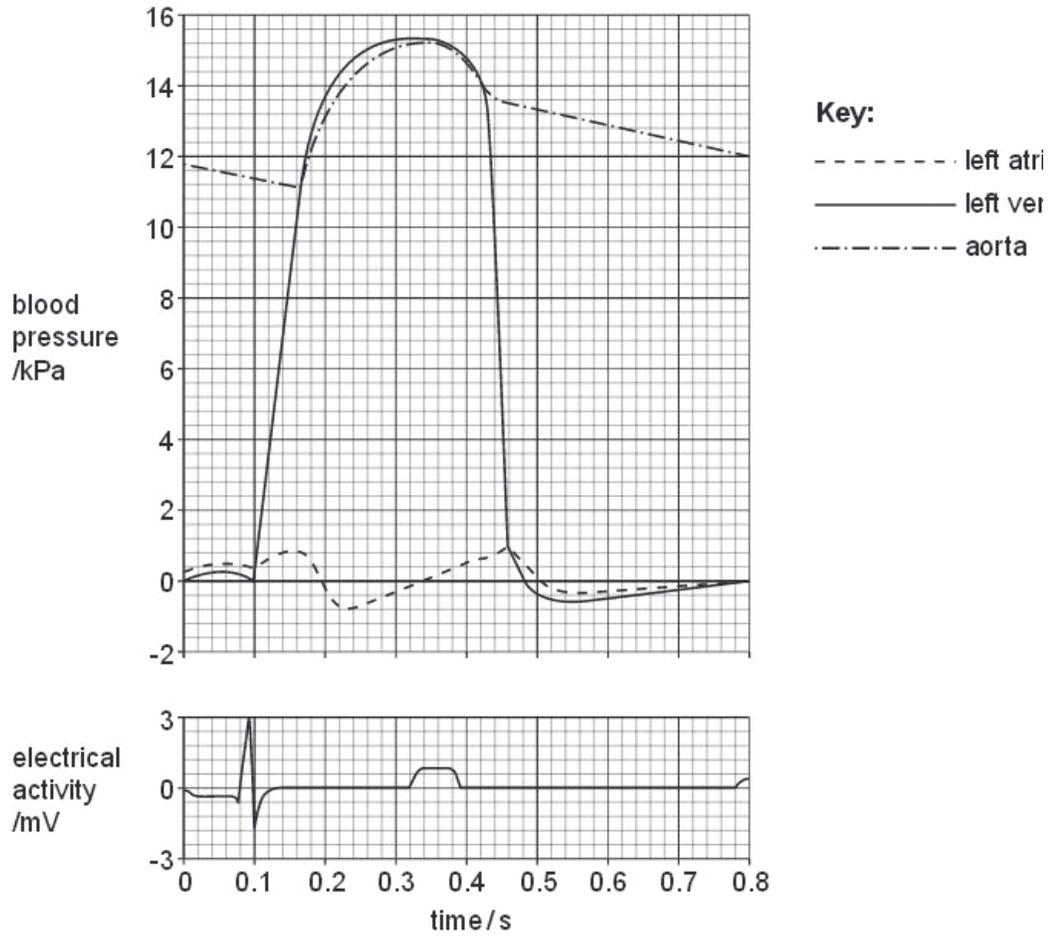
LA 000 11/11/11  
Use



## Q22.

- 4 Fig. 4.1 shows the changes in blood pressure in the left atrium, left ventricle and aorta during one complete contraction of the heart. It also shows a recording of the electrical activity of the heart.

LA 000 11/11/11  
Use



(a) Name the source of the electrical activity in the heart.

.....[1]

(b) Explain how the heart is coordinated so that the ventricle contracts after the atrium has contracted.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
..... [4]

(c) With reference to Fig. 4.1, calculate the heart rate in beats per minute. Show your working and express your answer to the nearest whole number.

Answer = ..... beats  $\text{min}^{-1}$  [2]

(d) The pressure in the **right ventricle** is rarely higher than 4.0 kPa.

Explain why the pressure in the right ventricle is much lower than that in the left ventricle.

.....  
.....  
.....  
..... [2]

[Total: 9]

Q23.

4 (a) Mammals have a closed, double circulation.

5

State what is meant by the term *double circulation*.

.....  
..... [1]

Fig. 4.1 shows part of the circulation in a mammalian tissue. The central part is enlarged to show a capillary, a cell supplied by the capillary, and vessel Z.

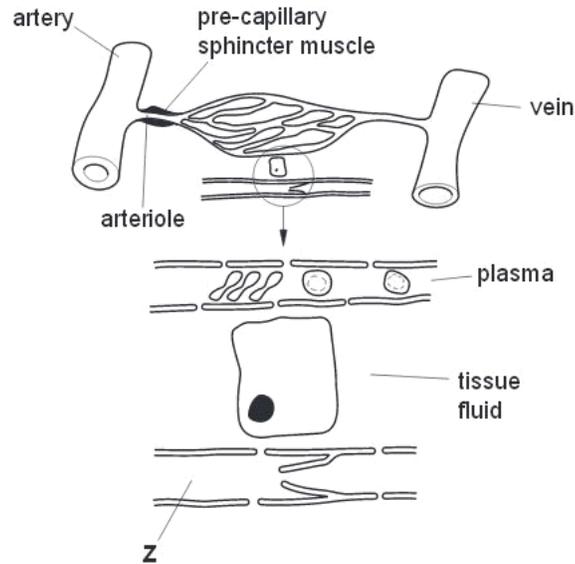


Fig. 4.1

(b) Explain why the wall of the artery is thicker than the wall of the vein.

.....  
.....  
.....  
..... [2]

(c) Suggest one role for the pre-capillary sphincter muscle shown in Fig. 4.1.

.....  
..... [1]

**(d)** With reference to Fig. 4.1, describe the role of capillaries in forming tissue fluid.

*For  
Examin.  
Use*

.....  
.....  
.....  
.....  
.....  
..... [3]

**(e) (i)** Describe three ways in which plasma differs from tissue fluid.

1. ....  
.....  
2. ....  
.....  
3. ....  
..... [3]

**(ii)** Name the fluid in vessel Z.

..... [1]

[Total: 11]

**Q24.**







2 (a) Describe the function of each of the following structures in the human heart:

For  
Exam  
Use

(i) sinoatrial node (SAN)

.....  
 .....  
 ..... [2]

(ii) atrioventricular node (AVN)

.....  
 .....  
 ..... [2]

(iii) left atrioventricular (bicuspid) valve.

.....  
 .....  
 .....  
 ..... [2]

(b) Fig. 2.1 shows the changes in blood pressure in the left atrium, left ventricle and aorta during one complete cardiac cycle.

For  
Exam  
Use

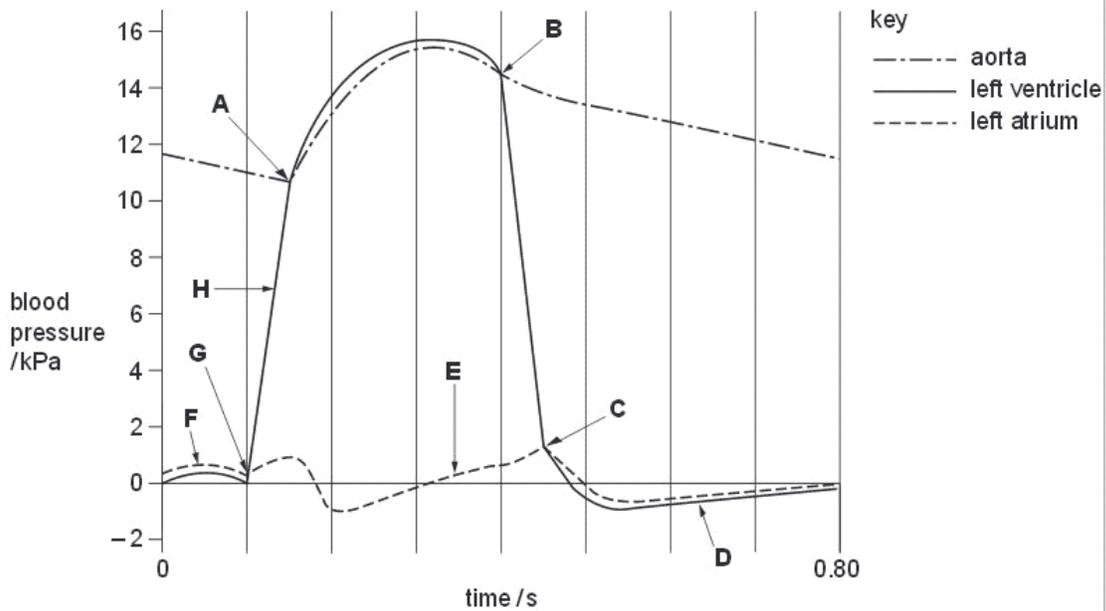


Fig. 2.1

Complete the table below using the appropriate letter, **A** to **H**, to match the points from the graph to the correct statement.

You must only put one letter in each box. You may use each letter once, more than once or not at all.

statement	letter
left atrioventricular (bicuspid) valve starting to open	
left atrioventricular (bicuspid) valve starting to close	
left ventricle starting to contract	
minimum blood remaining in left ventricle	

[4]

[Total: 10]

**Q27.**

5 Mammals have closed, double circulatory systems.

(a) Explain what are meant by the terms *closed* and *double* as applied to mammalian circulatory systems.

*closed* .....

.....

.....

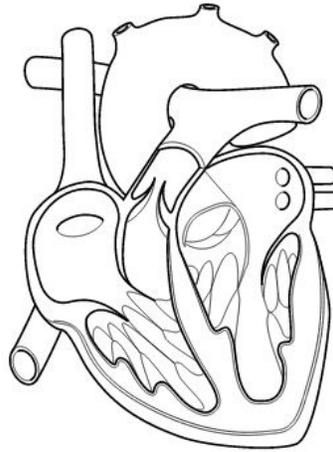
*double* .....

.....

..... [2]

Exan  
t

Fig. 5.1 shows a longitudinal section through a mammalian heart.



**Fig. 5.1**

**(b)** Use label lines and the letters **P**, **Q**, **R** and **S** to label the following on Fig. 5.1:

- P** the right atrium
- Q** a semilunar valve
- R** a blood vessel that carries deoxygenated blood
- S** the position of Purkyne tissue

[4]



Fig. 5.3 is an X-ray showing narrowing in the blood vessels supplying muscles in the heart. A catheter is used to insert a dye into the blood vessels so that they appear clearly in the X-ray. The arrows indicate where there is narrowing of the blood vessels.

For  
Examine  
Use



**Fig. 5.3**

- (d) (i) Name the blood vessels shown in Fig. 5.3.  
 .....[1]
- (ii) State the likely effect of narrowing of these blood vessels.  
 .....[1]
- (e) Suggest ways in which the condition shown in Fig. 5.3 may be treated.  
 .....  
 .....  
 .....  
 .....[2]

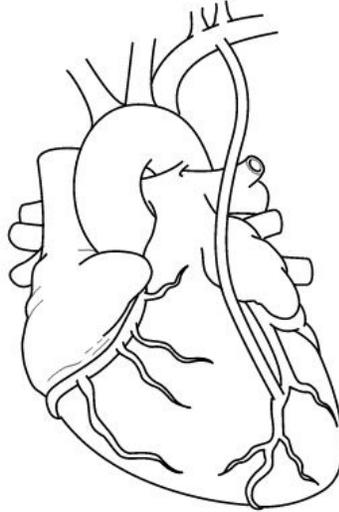
[Total: 16]

**Q28.**

6 Coronary artery bypass grafting is the most common heart operation in the world.

For  
Exam in  
Use

Fig. 6.1 is a diagram of a coronary bypass. The graft is a section of a healthy blood vessel. The blood vessel used in Fig. 6.1 is the internal mammary artery. It is a common choice for surgeons as it is quite resistant to arteriosclerosis.



**Fig. 6.1**

(a) Use label lines and the following letters to label the following on Fig. 6.1:

- A aorta
- B coronary artery
- C internal mammary artery
- D pulmonary artery
- E right atrium
- F vena cava

[3]

(b) On Fig. 6.1, mark with an X, the diseased area of the coronary artery for which the surgery has been performed.

[1]

- (c) With reference to coronary heart bypass surgery, discuss the difficulties in achieving a balance between prevention and cure.

Ex

.....

.....

.....

.....

.....

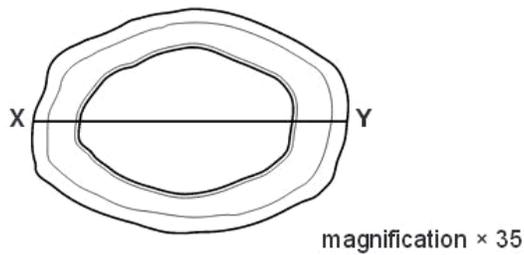
.....

..... [3]

[Total: 7]

**Q29.**

- 1 Fig. 1.1 is a diagram of a transverse section through a vein.



**Fig. 1.1**

- (a) Calculate the actual diameter of the vein marked by the line X–Y.

Show your working and give your answer in millimetres (mm).

answer ..... mm [2]

- (b) The presence of a valve would help to confirm that the blood vessel in Fig. 1.1 is a vein and not an artery.

Describe three structural features of the blood vessel shown in Fig. 1.1 that would help to identify it as a vein and **not** as an artery.

1. ....  
.....  
.....
  2. ....  
.....  
.....
  3. ....  
.....  
.....
- [3]

- (c) Explain how the following structural features of a capillary are related to its function.

- (i) The capillary wall is composed of a single layer of squamous epithelial cells.

.....  
..... [1]

- (ii) The diameter of the capillary lumen is approximately  $8\mu\text{m}$ .

.....  
..... [1]

**Q30.**















