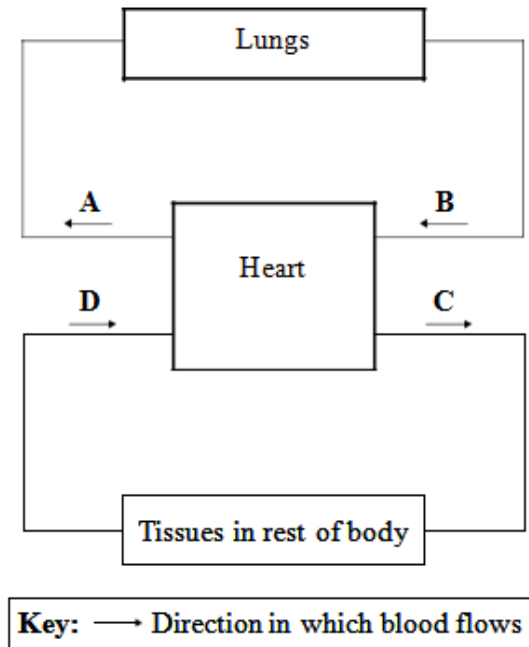


Circulatory System

Q:1 The diagram represents the human blood circulation system.



(a) A, B, C and D are blood vessels.

(i) Give the letter of one blood vessel that is an artery.

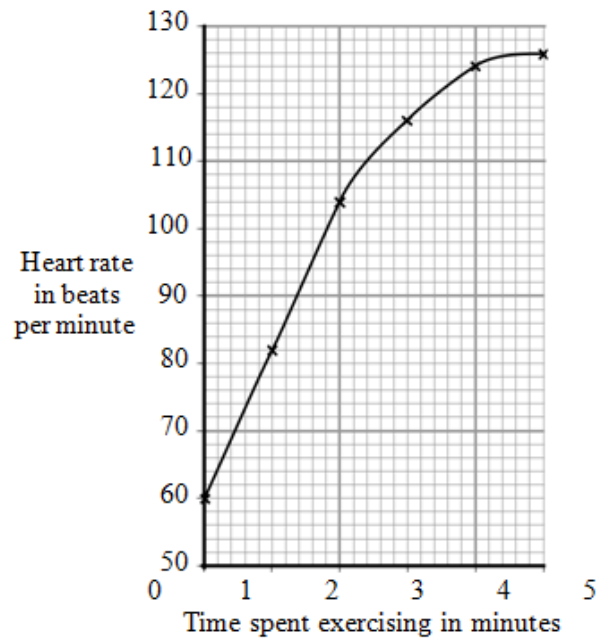
_____ (1 mark)

(ii) Give the letter of one blood vessel that is a vein.

_____ (1 mark)

(b) A student pedalled an exercise cycle at constant speed for 5 minutes. The student's heart rate was recorded at one-minute intervals during the exercise.

The results are shown in the graph.



(i) What was the student's heart rate before the exercise began?

_____ per minute

(1 mark)

(ii) How long was it before the student's heart rate reached 124 beats per minute?

_____ . minutes

(1 mark)

(c) Which of the following parts of the blood carries most oxygen? Draw a circle around one answer.

plasma red blood cells white blood cells

(1 mark)

Q:2 (a) Draw a ring around one word to answer each of the following questions.

(a)(i) Which type of blood vessel carries blood out of the heart?

artery capillary vein

(1 mark)

(a)(ii) Which type of blood vessel allows substances to enter and leave the blood?

artery capillary vein

(1 mark)

(b) Use words from the box to complete the sentences.

alveoli	cell membrane	nucleus	plasma
red blood cells	villi		

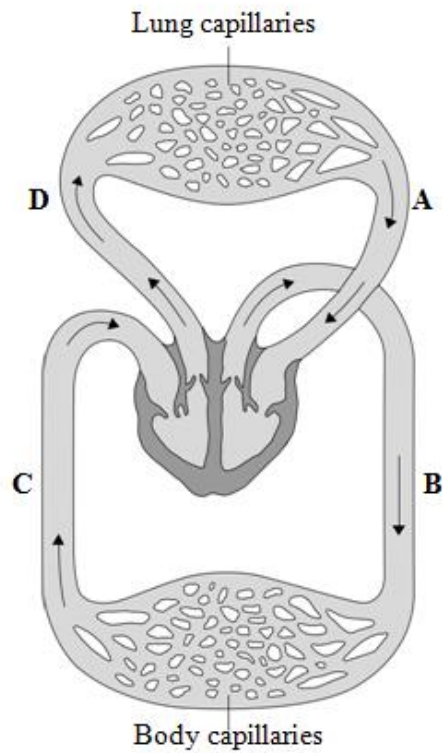
Oxygen enters the blood through the walls of the. _____

Most of the oxygen transported by the blood is carried in the

A red blood cell is different from other body cells because it does not have a

(3 marks)

Q:3 The diagram shows the human circulation system.



(a)(i) Give the letter of one blood vessel that is an artery.

(1 mark)

(a)(ii) Give the letter of one blood vessel that carries oxygenated blood.

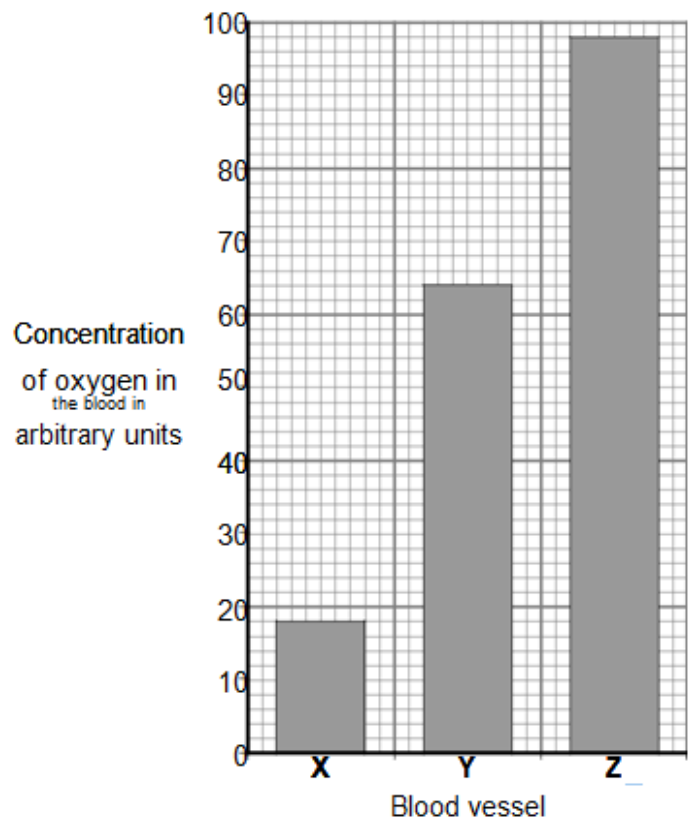
(1 mark)

(b) During exercise, the heart rate increases.

Explain, as fully as you can, why this increase is necessary.

(4 marks)

Q:4 The bar chart shows the concentration of oxygen in the blood in three different blood vessels, X, Y and Z.



(a) (i) What is the concentration of oxygen in blood vessel X?

Answer _____ arbitrary units.

(1 mark)

(a) (ii) Which blood vessel, X, Y or Z, carries blood from the lungs to the heart?

(1 mark)

(b) Draw a ring around the correct answer to complete each sentence.

(b) (i) Most of the oxygen in the blood is carried by the

plasma.
red blood cells.
white blood cells.

(1 mark)

(b) (ii) Oxygen combines with a coloured pigment in the blood.

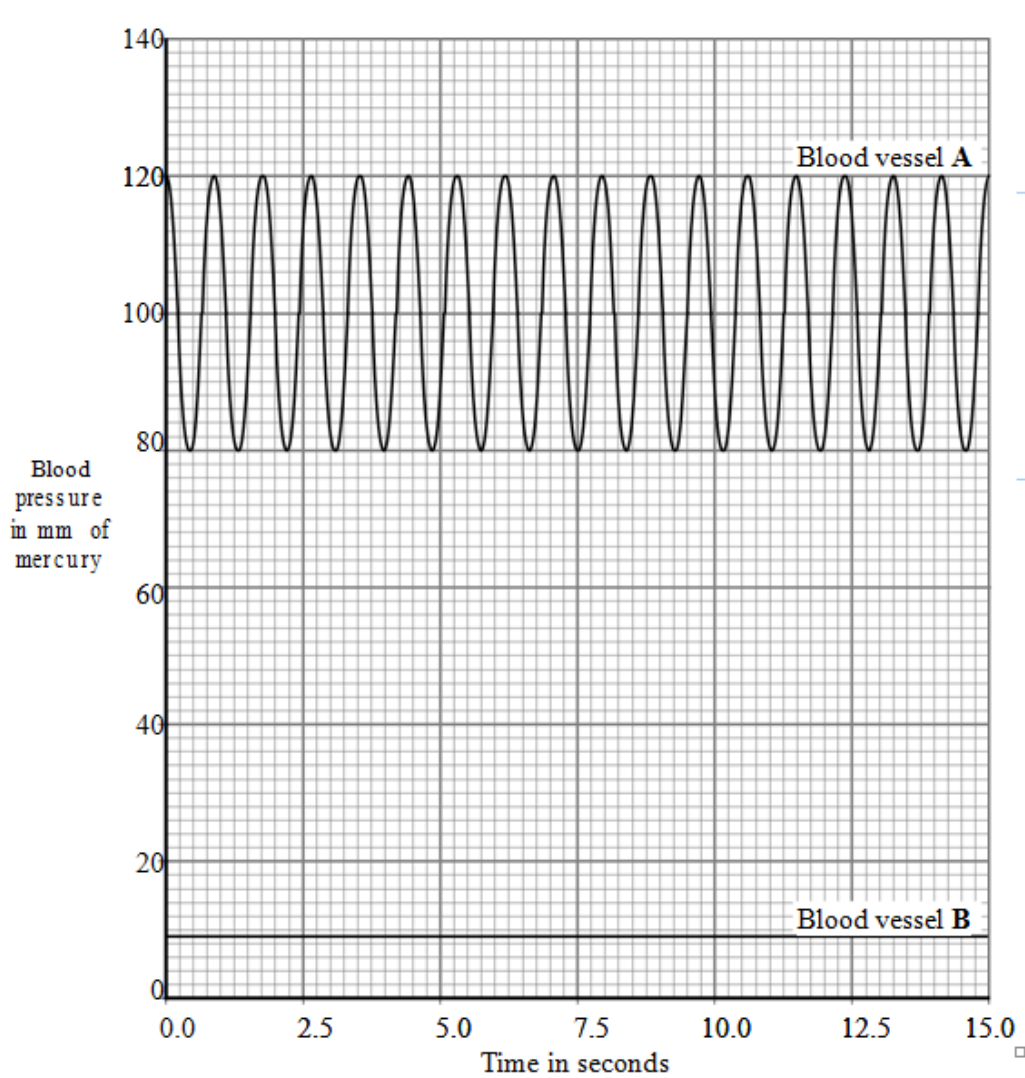
This coloured pigment is called

alveoli.
haemoglobin.
lactic acid.

(1 mark)

Q:5 The heart pumps blood around the body. This causes blood to leave the heart at high pressure.

The graph shows blood pressure measurements for a person at rest. The blood pressure was measured in an artery and in a vein.



(a) Which blood vessel, A or B, is the artery? Blood vessel _____

Give two reasons for your answer.

Reason 1

Reason 2

(2 marks)

(b) Use information from the graph to answer these questions.

(b)(i) How many times did the heart beat in 15 seconds?

(1 mark)

(b)(ii) Use your answer from part (b)(i) to calculate the person's heart rate per minute.

Heart rate = _____ beats per minute

(1 mark)

(c) During exercise, the heart rate increases. This supplies useful substances to the muscles and removes waste materials from the muscles at a faster rate.

(c)(i) Name two useful substances that must be supplied to the muscles at a faster rate during exercise.

1 _____

2 _____

(2 marks)

(c)(ii) Name one waste substance that must be removed from the muscles at a faster rate during exercise.

(1 mark)

Q:6 Oxygen is transported round the body by the blood.

Blood leaving the human lung can carry about 250 milligrams of oxygen per litre. However, only 7 milligrams of oxygen will dissolve in one litre of water at body temperature.

(a) Suggest an explanation for the difference.

(2 marks)

(b) Blood leaving the skeletal muscles during exercise may contain only 30 milligrams of oxygen per litre.

Explain what causes the difference in oxygen concentration between the blood leaving the lungs and the blood leaving the skeletal muscles.

(4 marks)

TOTAL MARKS=31