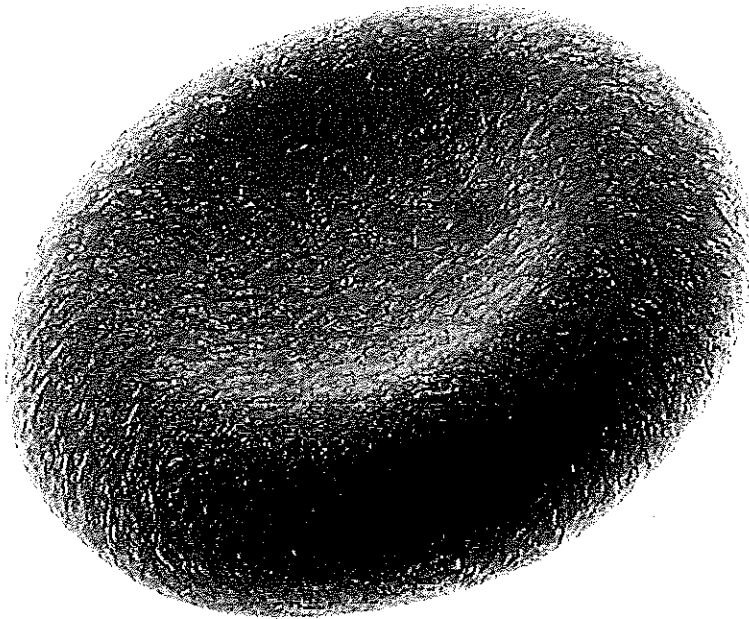


2. The diagram shows a red blood cell.



(a) (i) What is the name of the pigment in the cell that helps it to absorb oxygen?

Haemoglobin (1)

(ii) Explain how the shape of the cell helps it to absorb oxygen.

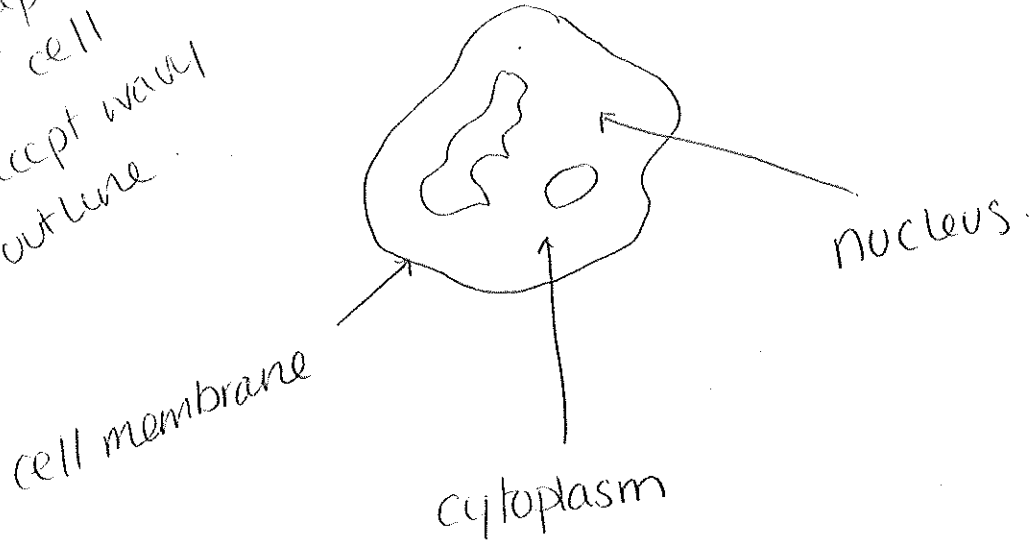
biconcave / biconcave described;
more surface / large SA:Vol / eq ;
diffusion
ignore thin / permeable / small lack nucleus. (2)



(b) There are two types of white blood cell. One type is called a lymphocyte and produces antibodies. The other type is called a phagocyte.

(i) In the space below, draw and label a phagocyte.

shape of cell
Accept wavy outline



(3)

(ii) Describe how a phagocyte helps to destroy pathogens.

Ingest / ingestion described / engulf ;
digest / enzymes / break down ;
.....
.....

(2)

Q2

(Total 8 marks)



2 The box shows the names of three blood vessels.

aorta	capillary	vena cava
-------	-----------	-----------

(a) The table gives information about these blood vessels.

Complete the table by writing the name of the correct blood vessel in each empty box.

Name of blood vessel	Diameter of the lumen in mm	Thickness of the vessel wall in mm
vena cava	30.0	1.5
capillary	0.006	0.001
aorta	25.0	2.0

(b) (i) Which of these blood vessels carries blood containing the most oxygen?

aorta

(ii) Which of these blood vessels carries blood at the lowest pressure?

vena cava

(iii) Which of these blood vessels is most suited for gas exchange?

Explain your answer.

capillary;

'one cell thick / thin wall membrane / short diffusion distance / low pressure / slow bf

(Total for Question 2 = 6 marks)

- 5 An investigation was carried out to find out the effect of fear on human heart rate. Ten students measured their heart rate under normal conditions. The students were then given a fright and asked to measure their heart rate again.

The table shows their results.

Student number	Heart rate in beats per minute	
	Normal conditions	When frightened
1	70	80
2	65	85
3	59	66
4	66	75
5	57	66
6	60	68
7	63	67
8	72	72
9	62	74
10	70	77

- (a) (i) Identify the student whose result was anomalous.

(1)

Student 8.

- (ii) Describe and explain the results of this investigation.

(2)

rate faster when frightened;
adrenaline; epinephrin / noradrenaline

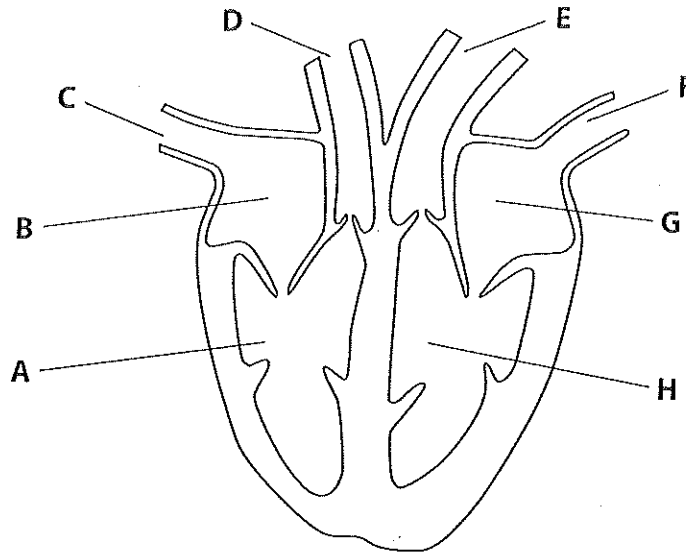
- (iii) State, with a reason, whether the results of this investigation are reliable.

(1)

Yes repeated / 10 / lots of ppl. similar pattern
No not enough people / one student not
ignoe validity expect globe frightened.
frightened / age of student.



(b) The diagram shows the human heart with four chambers and four blood vessels labelled A to H.



Complete the table by writing in the label letter that matches the description of the structure.

The first one has been done for you.

(4)

Structure	Label letter
the right atrium	B
the chamber that pumps blood to the lungs	A
the chamber with the thickest muscle wall	H
the blood vessel containing blood at the highest pressure	E
the blood vessel carrying blood with the least oxygen to the heart	C

(Total for Question 5 = 8 marks)



6 Multicellular organisms have a transport system for nutrients and waste products. In humans this transport system involves the blood.

(a) The table names some components of blood. Complete the table by giving the function of each component and its cell type.

(4)

Component of blood	Function	Cell type
platelet	clotting / clot lg scab / net / mesh / plug	cell fragment
phagocyte	engulf / ingest destroy kill	white cell
lymphocyte	antibody / antitoxin / immune response	white

(b) Suggest the consequence of having too few platelets in the blood.

(2)

less/no clotting / fibrin

blood loss

entry of micro organisms / infection . ig Disease

(c) Vaccination causes the body to produce memory cells.

Describe the advantages to the human body of producing memory cells.

(2)

Antibody ;

faster / sooner antibody protection / faster response
to infection eg :

more antibody .

(Total for Question 6 = 8 marks)

TOTAL FOR PAPER = 60 MARKS

