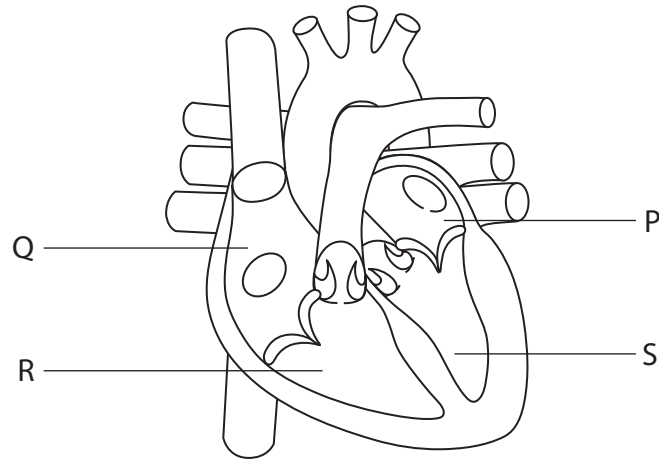


8 This diagram shows the structure of a normal human heart.



(a) (i) Which chamber of the heart generates the highest blood pressure?

(1)

- A P
- B Q
- C R
- D S

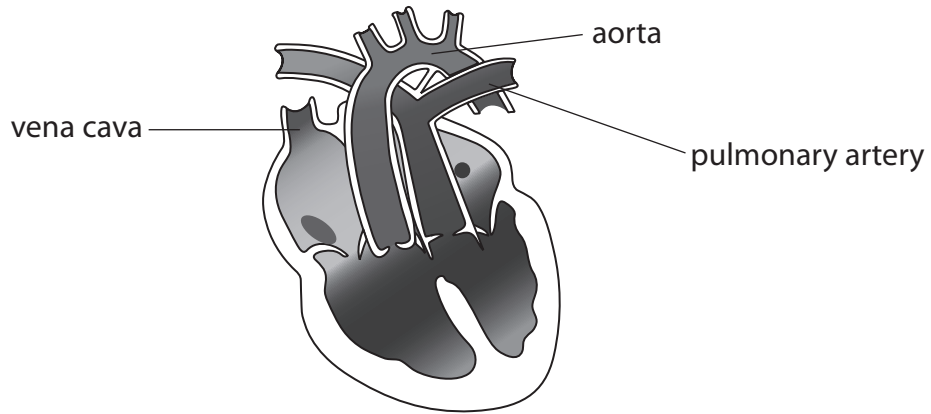
(ii) Which stage of the cardiac cycle is shown in the diagram of the heart?

(1)

- A atrial diastole
- B atrial systole
- C ventricular diastole
- D ventricular systole



(b) A baby was born with an abnormal heart. The diagram shows the heart of this baby. There is a hole in the septum between the two ventricles.



(i) Identify the problem with the blood vessels of this heart.

(1)

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(ii) The baby survived because of the hole in the septum of the heart.  
Explain how the hole in the septum allowed this baby to survive.

(3)

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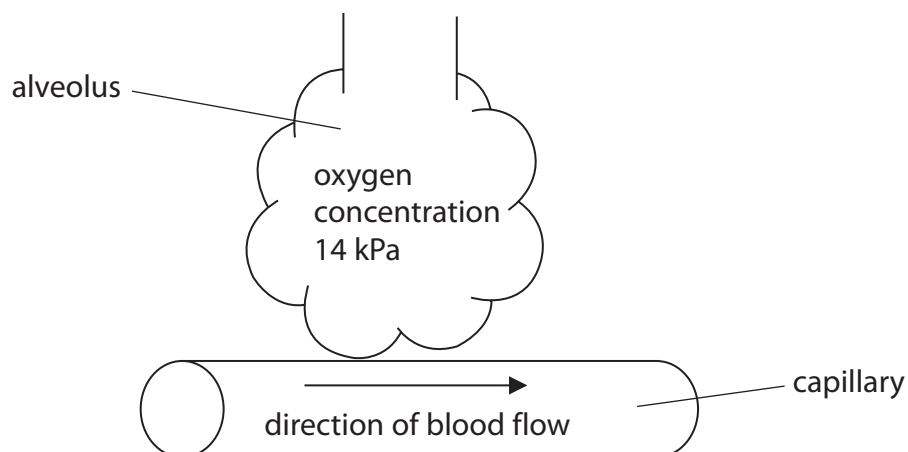
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(iii) Oxygen diffuses between the alveoli of the lungs and the blood.

Fick's Law shows how three factors affect the rate of diffusion:

$$\text{Rate of diffusion} = \frac{\text{surface area} \times \text{concentration difference}}{\text{diffusion distance}}$$

The diagram and the table give information about the oxygen concentration in the alveoli and in the blood.



Heart	Oxygen concentration / kPa	
	Blood entering the lungs	Blood leaving the lungs
Normal	5	13
With hole in the septum between the ventricles	8	10



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\*Assess the effect of this heart defect on the rate of oxygen diffusion between the alveoli and the blood.

(6)

Area with horizontal dotted lines for writing the answer.

(Total for Question 8 = 12 marks)

**TOTAL FOR PAPER = 80 MARKS**



P 4 9 8 2 9 A 0 2 5 2 8