

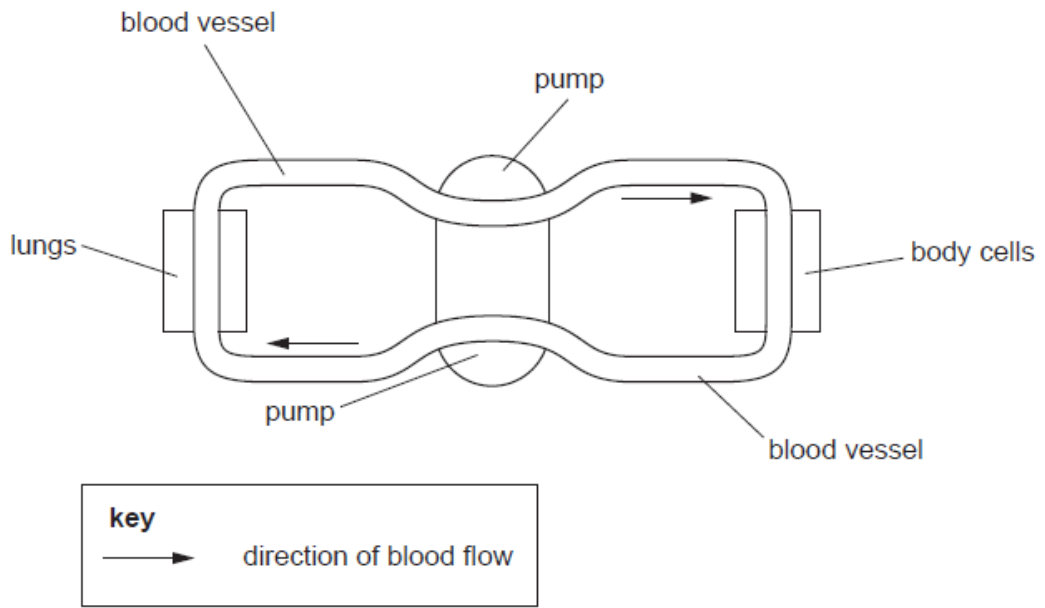
**GCSE Biology A (Gateway)**

**J247/01 B1-B3 and B7 Foundation (Foundation Tier)**

**Question Set 23**

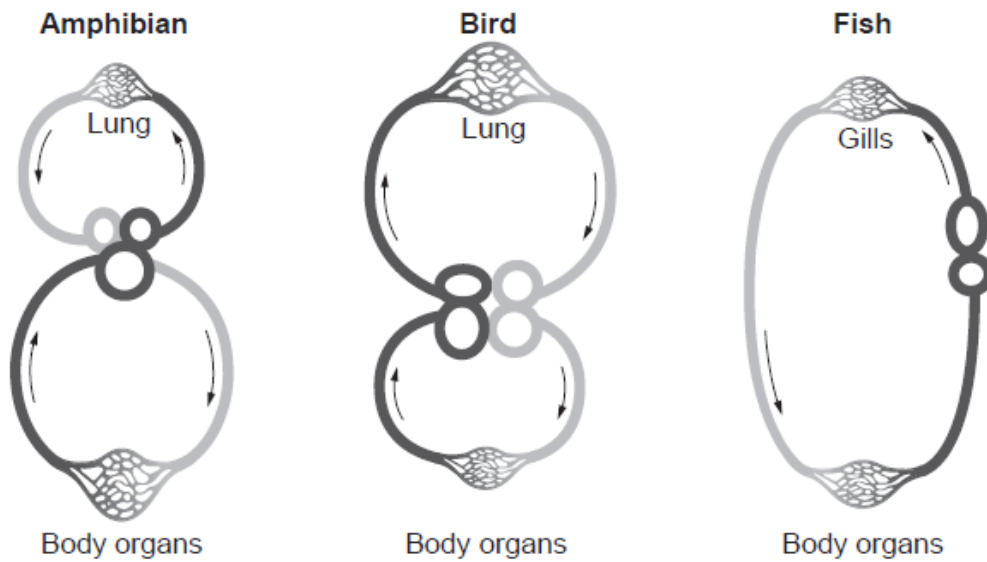
1

Look at the diagram. It represents the human circulatory system.



(a) Describe how the diagram shows that humans have a double circulatory system. [2]

(b) Look at the diagrams of the circulation systems in an amphibian, bird and fish.



Which of these has a circulatory system most similar to humans?

Tick (✓) **one** box.

Amphibian

Bird

Fish

Explain your choice.

[3]

(c)

Scientists investigate how exercise affects blood flow to different organs in the body.

This is their method.

- Ask a healthy person to sit in a room at 20 °C
- Measure the blood flow to different organs in the person's body
- Repeat this with the person exercising at a constant speed on a treadmill in the sameroom.

The table shows the scientists' results.

Organ	Rate of blood flow (ml per minute)	
	Sitting	Doing exercise
Brain	750	750
Heart muscle	250	1000
Muscles	1200	22000
Skin	500	600
Other organs	3100	650
<b>Total</b>	<b>5800</b>	<b>25000</b>

(i)

By how many times has the **total** blood flow increased by doing exercise?

Give your answer to the **nearest whole number**.

Number of times the total blood flow has increased = .....

[2]

- (ii) The table shows that blood flow to other organs has decreased by nearly 5 times when a person is **doing exercise**.

The blood flow to the muscles has increased by more than eighteen times.

Explain these changes to blood flow rate.

[2]

**Total Marks for Question Set 23: 9**

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