

0 3

The circulatory system is composed of the blood, blood vessels and the heart.

0 3 . 1

Urea is transported in the blood plasma.

Name **two** other substances transported in the blood plasma.

[2 marks]

1 \_\_\_\_\_

2 \_\_\_\_\_

0 3 . 2

Some athletes train at high altitude.

Training at high altitude increases the number of red blood cells per  $\text{cm}^3$  of blood.

Explain why having more red blood cells per  $\text{cm}^3$  of blood is an advantage to an athlete.

[3 marks]

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0 3 . 3

Which **two** blood vessels carry deoxygenated blood?

[2 marks]

Tick **two** boxes.

Aorta

Coronary artery

Pulmonary artery

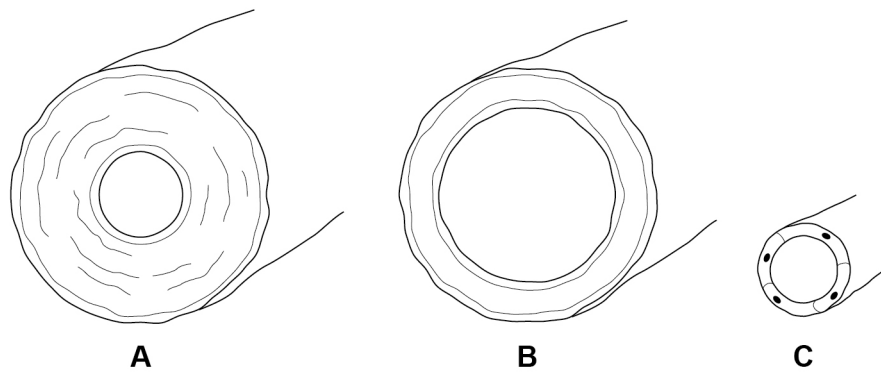
Pulmonary vein

Vena cava

Turn over ►

Figure 4 shows the three types of blood vessel.

Figure 4



0 3 . 4

Which type of blood vessel carries blood into the right atrium?

[1 mark]

Tick **one** box.

A	
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B	
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C	
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0 3 . 5

Compare the structure of an artery with the structure of a vein.

[3 marks]

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**0 3 . 6** Heart rate is controlled by a group of cells. This group of cells act as a pacemaker.

**Figure 5** shows a section through the heart.

Draw an **X** on **Figure 5** to show the position of the pacemaker.

**[1 mark]**

**Figure 5**



**0 3 . 7** A patient may be fitted with an artificial pacemaker.

What condition may be treated using an artificial pacemaker?

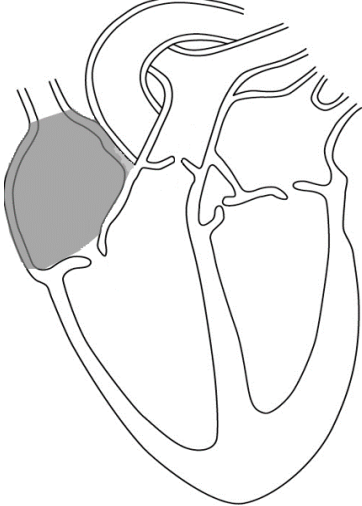
**[1 mark]**

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Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.1	any <b>two</b> from: <ul style="list-style-type: none"> <li>• carbon dioxide</li> <li>• water</li> <li>• glucose</li> <li>• amino acids</li> <li>• lactic acid</li> </ul>	allow proteins / hormones / antibodies / vitamins / minerals / ions / fatty acids / glycerol  ignore sugar / enzymes / nutrients / waste	2	AO1 4.2.2.3
03.2	more haemoglobin  (therefore) more oxygen can be carried / transported  (for) more (aerobic) respiration of muscle (cells) <b>or</b> more energy released for muscle (cells)	<b>max 2</b> marks if 'more' is not given    allow less anaerobic respiration / lactic acid / oxygen debt / fatigue in muscle (cells) ie addition of 'debt'  do <b>not</b> accept energy produced	1  1  1	AO1 4.2.2.3 4.4.2.2  AO2 4.2.2.3 4.4.2.2  AO1 4.2.2.3 4.4.2.2
03.3	pulmonary artery  vena cava		1  1	AO1 4.2.2.2
03.4	B		1	AO1 4.2.2.2

<p><b>03.5</b></p>	<p>any <b>three</b> from:</p> <ul style="list-style-type: none"> <li>arteries have a <b>thicker</b> layer of muscle (tissue) <b>or</b> veins have a <b>thinner</b> layer of muscle (tissue)</li> <li>arteries have a <b>thicker</b> layer of elastic tissue <b>or</b> veins have a <b>thinner</b> layer of elastic tissue</li> <li>arteries have a <b>narrower</b> lumen <b>or</b> veins have a <b>wider</b> lumen</li> <li>arteries do not have valves <b>and</b> veins have valves</li> </ul>	<p>if neither marking points 1 or 2 awarded, allow arteries have a thick wall <b>and</b> veins have a thin wall <b>or</b> arteries have a <b>thicker</b> wall <b>or</b> veins have a <b>thinner</b> wall for <b>1</b> mark do <b>not</b> accept 'cell wall'</p> <p>allow descriptions of 'lumen'</p> <p>allow <b>only</b> veins have valves</p>	<p>3</p>	<p>AO1 4.2.2.2</p>
<p><b>03.6</b></p>	<p>allow an X drawn anywhere in grey shaded area below:</p> 	<p>if a large X is drawn, award the mark if the intersection touches the grey area</p> <p>if a label line is used, award marks if the end of the label line touches the grey area</p> <p>allow label 'pacemaker'</p> <p>ignore label 'right atrium'</p>	<p>1</p>	<p>AO1 4.2.2.2</p>
<p><b>03.7</b></p>	<p>an irregular heart beat</p>	<p>allow arrhythmia allow fibrillation</p> <p>ignore heart failure</p> <p>do <b>not</b> accept cardiovascular disease / heart murmur</p>	<p>1</p>	<p>AO1 4.2.2.2</p>
<p><b>Total</b></p>			<p><b>13</b></p>	