

2 (a) Haemoglobin is a globular protein containing haem groups.

Explain how the presence of haem groups allows the haemoglobin molecule to transport oxygen.

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(b) In certain situations, such as during intense exercise, a person may breathe very quickly and deeply. This is known as hyperventilation.

This hyperventilation causes more carbon dioxide to be exhaled. As a result, there is a lower concentration of carbon dioxide in the blood that passes through the capillary network in respiring tissues. This increases the affinity of haemoglobin for oxygen so that there is a decrease in the release of oxygen from red blood cells.

Explain why a decrease in the concentration of carbon dioxide in the blood passing through respiring tissues leads to a decrease in the release of oxygen from red blood cells.

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(c) Fig. 2.1 is a diagram of a section through the heart.

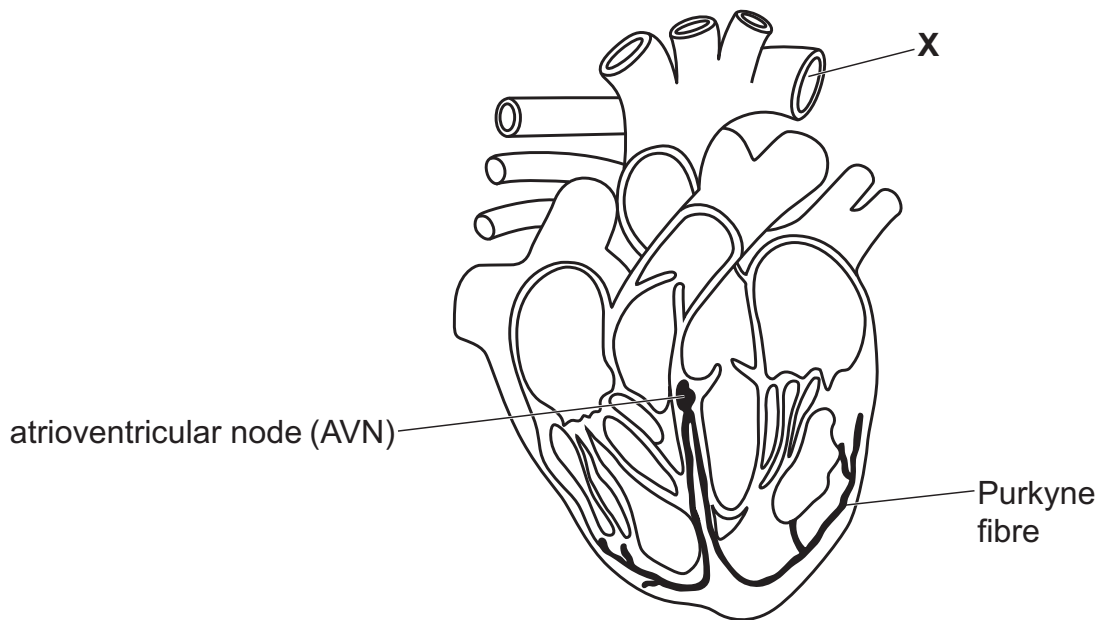


Fig. 2.1

(i) Describe and explain how the tunica media (middle layer of the wall) of blood vessel X adapts the blood vessel for its function.

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(ii) Describe the role of the atrioventricular node (AVN) and the Purkyne tissue in the cardiac cycle.

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