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The heart receives a supply of oxygen through the arteries. These arteries can sometimes become narrowed. Narrowed arteries could cause a heart attack. One method used to treat a narrowed artery is by using a stent.

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Name the arteries that supply blood to the heart [1 mark]

Coronary arteries [1]

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Explain how treatment using a stent could prevent a heart attack [2 marks]

Stent is a memory shape mesh that is fed into a blood vessel and inflated using a balloon [1]

stent opens the (coronary) artery [1]

allowing blood to carry oxygen/glucose/nutrients to the heart/muscle cells [1]

**TOP TIP :** There are other ways to treat narrowed arteries including bypass operations or taking statins or by lowering your cholesterol levels. This question specifically asks about stents. The other answers would be valid if the question asked how to treat narrowed arteries.

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If a heart valve is damaged blood may flow in the wrong direction, reducing the amount of oxygen and glucose that gets delivered to the body tissues. Major surgery is needed to replace the faulty valve and if it is an artificial valve that is used in the replacement, there is a chance that the valve may not work. If the surface of the valve becomes rough, small blood clots may form and these can break off and move into the blood vessels.

Using information from the passage above, as well as your own knowledge, evaluate the advantages and disadvantages of using artificial heart valves.

[4 marks]

**Advantages:** blood circulates better [1]; improved oxygen/glucose to cells/ improved respiration [1]; more energy (released)/more active lifestyle/less tired [1]; less risk of rejection (as it is not made of living tissue) [1]

**Disadvantages:** risk of surgery [1]; infection risk (from surgery) [1]; valve may need replacing/may not work [1]; anticoagulants/warfarin/blood thinners need to be taken [1]; clots may cause heart attacks/stroke [1]

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Suggest **one** advantage and **one** disadvantage of using a natural donor heart rather than an artificial heart in heart transplant operations [2 marks]

Advantage lasts longer/no need for blood thinners [1]

Disadvantage less readily available/tissue match required/rejection/take immunosuppressants for life [1]