

# Circulatory System 4

**Q:1** Drugs are used to treat cardiovascular diseases (diseases of the heart and blood vessels).

**(a)** What is a drug?

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**(1 mark)**

**(b)** People can be treated for cardiovascular diseases with statins or aspirin.

Information about these two drugs is given in the table.

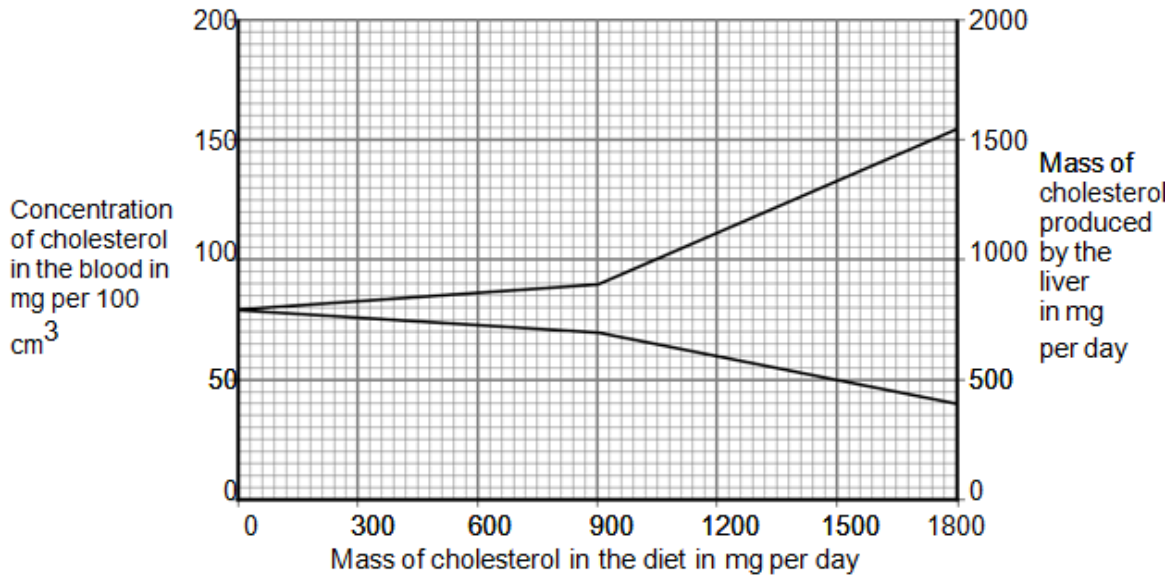
<b>STATINS</b>	<b>ASPIRIN</b>
<p>Statins are only available on prescription from doctors.</p> <p>In studies, 30 000 patients were monitored over several years. Statins were found to reduce the rate of non-fatal heart attacks by about 30%.</p> <p>Approximately 0.1% of the patients suffered serious muscle damage and 0.01% suffered kidney failure.</p> <p>Statins reduce blood cholesterol which builds up in the walls of blood vessels. The cost of treating patients with statins can vary between £150 and £500 per year, depending on the type of cardiovascular disease being treated.</p>	<p>Aspirin can be bought over the counter. Treatment with aspirin costs up to £15 per year.</p> <p>In a study of 1000 patients, aspirin was found to cause bleeding of the stomach in around 0.5% of patients and there was a slightly increased risk of poor blood clotting at cuts.</p> <p>There was a slightly increased risk of damage to the blood vessels in the brain in older patients.</p> <p>Aspirin was found to reduce the risk of non-fatal heart attacks by 31%.</p>



**Q:2** Figure 6 shows the effect of the mass of cholesterol in the diet on:

- the concentration of cholesterol in the blood
- the mass of cholesterol produced by the liver.

**Figure 6**



**Key**

- Blood cholesterol concentration
- - - Production by the liver

Describe the effect of increasing the mass of cholesterol in the diet on the mass of cholesterol produced by the liver. To gain full marks you should include data from Figure 6 in your answer.

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[2 marks]

**(b)** Large amounts of cholesterol in the diet switch off the production of an enzyme called reductase, in the liver.

An increase of the enzyme reductase increases the production of cholesterol by the liver.

**(b) (i)** Which part of a liver cell is responsible for controlling the production of reductase?

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**[1 mark]**

**(b) (ii)** High blood cholesterol concentrations increase the likelihood of heart and circulatory diseases.

Doctors can prescribe statins to control the concentration of cholesterol in the blood.

Suggest how statins work.

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**[2 marks]**

**TOTAL MARKS=11**