

Question	Answers	Extra information	Mark	AO / Specification reference
01.1	any disease of the heart or blood vessels		1	AO1 4.2.2.6 MS 1c
01.2	22%		1	AO2 4.2.2.5 4.2.2.6 MS 1c
01.3	33 000	award 1 mark for $0.22 \times 150\,000$	2	AO2 4.2.2.5 4.2.2.6
01.4	<p>any three suggestions + explanations from:</p> <ul style="list-style-type: none"> eat fewer fatty foods – which would reduce the build-up of cholesterol which would lead to blocked arteries ensure energy input in food matches daily energy consumption / maintain a healthy weight – to prevent excess food being stored as fat (if obese) exercise more / consume less food / energy than daily requirement – to lose excess weight stop smoking / do not smoke – as smoking narrows blood vessels / damages artery lining / increases risk of clot formation / increases blood pressure 	<p>to award 6 marks, answers should include three lifestyle factors with three linked explanations.</p> <p>accept other acceptable answers with linked explanations</p>	6	AO1 4.2.2.6

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03.1	any two from: <ul style="list-style-type: none"> all risk factors show a decrease smoking levels have decreased the least (compared to 1972) the greatest decrease has been seen in people with cholesterol above recommended levels smoking has not shown a continual decline / increased in the 1990s 	accept other alternative trend from the data	2	AO2 4.2.2.4 4.2.2.5 4.2.2.6
03.2	any four from: <ul style="list-style-type: none"> better education / positive results from public health campaigns (linked to any risk factor) meaning people make positive lifestyle choices better diet leading to reduced cholesterol / blood pressure (linked to any risk factor) (significantly) fewer deaths due to CVD because key risk factors for CVD have all reduced / improved healthcare 	answers should include two suggestions and two linked reasons to award 4 marks accept other reasonable suggestions with linked effects on lifestyle / mortality rates	4	AO3 4.2.2.4 4.2.2.5 4.2.2.6

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03.3	fatty material / cholesterol builds up in coronary arteries reduces blood flow less oxygen / glucose reaches the heart muscle / less respiration of heart muscle cells.		1 1 1	AO1 4.2.2.4
03.4	statins		1	AO1 4.2.2.2
03.5	130	accept proportion of deaths = 20% of 1972 level (650) award 2 marks for 0.2×650	3	AO3 4.2.2.4 4.2.2.5 MS 1c
03.6	any three from: <ul style="list-style-type: none"> • data correlate with the conclusion, supporting the conclusion made • data do not give causation • population studied may have been atypical • data are collected from one (isolated) population and so generalities may not be drawn to all populations • other risk / lifestyle factors were not noted which may have had an underlying effect on the outcomes 	accept other reasonable statement	3	AO3 4.2.2.4

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04.1	a correlation means there is a link between a factor and a disease (however the risk factor does not necessarily cause the disease).		1	AO1 4.2.2.6
	causation means that an increase in the risk factor results in an increase in the incidence of the disease.		1	
04.2	age / genes / biological sex		1	AO1 4.2.2.6
04.3	a disease caused by cell division/growth of cells/cell multiplication/mitosis		1	AO1
	that is out of control/abnormal/uncontrolled.		1	4.2.2.7
04.4	UV light in sun causes changes in DNA / mutations (if not corrected by body) this can lead to uncontrolled cell division		1	AO1
			1	4.2.2.7
04.5	benign tumours are contained within a membrane	accept converse answer	1	AO1
	don't invade nearby tissue / can't spread (not cancerous)		1	4.2.2.7
	to form secondary tumours		1	
05.1	to prevent back flow of blood		1	AO2
	from left ventricle (into left atrium)		1	4.2.2.2

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05.2	<p>advantages of mechanical heart valve</p> <p>the valve will last longer</p> <p>will require fewer additional surgical procedures in the future</p> <p>not made from an animal product which some people may object to on ethical grounds</p> <p>less chance of body rejection as not using tissue from another organism</p> <p>disadvantages of mechanical valve</p> <p>newer technique – less proven track record / less evidence of any potential long term risks</p> <p>patient has to take permanent medication</p> <p>disadvantages of both / either valve</p> <p>patient will require further procedures in the future</p> <p>both carry risk of rejection</p> <p>both carry risk of infection</p>	<p>to award full marks, answers should include comparative statements between the two types of heart valve, considering at least three factors linked to the two types of valve</p> <p>accept converse statements if answers linked to biological valve</p>	3	AO1 4.2.2.4

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05.3	<p>advantages of mechanical heart valve</p> <ul style="list-style-type: none"> the valve will last longer will require fewer additional surgical procedures in the future not made from an animal product which some people may object to on ethical grounds less chance of body rejection as not using tissue from another organism <p>disadvantages of mechanical valve</p> <ul style="list-style-type: none"> newer technique – less proven track record / less evidence of any potential long term risks patient has to take permanent medication <p>disadvantages of both / either valve</p> <ul style="list-style-type: none"> patient will require further procedures in the future both carry risk of rejection both carry risk of infection 	<p>to award full marks, answers should include comparative statements between the two types of heart valve, considering at least three factors linked to the two types of valve</p> <p>accept converse statements if answers linked to biological valve</p>	6	AO3 4.2.2.4
06.1	21.3 (kg/m ²)	accept $\frac{48}{1.5^2}$ for 1 mark	1 1	AO2 4.2.2.5 4.2.2.6 MS 1c

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06.2	healthy weight		1	AO2 4.2.2.5 4.2.2.6 MS 3a
06.3	any six from: <ul style="list-style-type: none"> • obesity is a condition where a person is very overweight • obese people have an abnormal amount of excess body fat (beneath the skin) • obesity is a risk factor for cardiovascular disease • obesity leads to high blood pressure / the build-up of fatty deposits in the arteries • fatty deposits in the coronary arteries reduce the oxygen reaching the heart, causing a heart attack • build-up of fat / lipids in the abdomen increases blood pressure • obesity increases the risk of type 2 diabetes • where the body's cells lose their sensitivity to insulin – they no longer respond, or respond less effectively, to the insulin that is produced • fat intake and obesity increases the risk of certain cancers 		6	AO1 4.2.2.5 4.2.2.6

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06.4	<p>greater level of exercise (in population) means more energy expended than previously</p> <p>any one from:</p> <ul style="list-style-type: none">• reduces the number of people for whom energy intake > energy required• fewer people would become obese in future• larger number of people for whom energy required > energy intake• excess fat will be used to supply energy so these (obese) people would lose weight	to award 2 marks, answer should include energy comparison and effect on population of obese people	1 1	AO3 4.2.2.5 4.2.2.6

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06.5	<p>costs</p> <ul style="list-style-type: none"> • drug likely to be very expensive to prescribe • so the drugs company can make their development costs back (and make a profit) • so cost to NHS / users will be high • creates viewpoint (amongst public) that a drug can repair poor lifestyle choices • which may encourage more people to make unhealthy lifestyle choices • creating a dependency on the drug / leading to other health consequences, e.g. avoiding exercise <p>benefits</p> <ul style="list-style-type: none"> • will reduce number of obese people • which will increase their life expectancy / improve quality of life • also reducing number of obesity-related conditions / named condition • cost to healthcare system / NHS due to obesity-related conditions reduced 	<p>to gain 6 marks, answers should include at least one cost and one benefit to society award 1 mark for each cost, benefit and linked explanation</p> <p>allow other reasonable suggestions</p>	6	AO3 4.2.2.6

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07.1	fatty material builds up inside the coronary arteries causing them to narrow / lumen is reduced this reduces blood flow so less oxygen gets to the heart muscle		1 1 1 1	AO1 4.2.2.4
07.2	diet / inheritance / drugs		1	AO1 4.2.2.4
07.3	risk to patient of developing new condition is outweighed by / is smaller than positive impact of statins on risk of CVD	award 1 mark for risk to patient of other conditions is small award 1 mark for risk of developing oesophageal cancer also decreases	1 1	AO3 4.2.2.4 4.2.2.5
07.4	risk of liver disease in population = $\frac{4\,200\,000}{60\,000\,000}$ risk of liver disease 7% additional risk of liver disease due to statins = $\frac{75}{10\,000}$ additional risk = 0.75% statement quantifying risk as significant, e.g. risk is approx. 10% greater / insignificant, e.g. 0.75% is a very small risk		1 1 1 1 1	AO3 4.2.2.4 4.2.2.5 MS 1c
08.1	reduces blood flow reducing the amount of oxygen delivered to the heart		1 1	AO2 4.2.2.4

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08.2	use a stent / metal mesh small balloon inserted into the artery which is then inflated to open up the blood vessel stent stays in place to keep the artery open allowing blood to flow		1 1 1	AO2 4.2.2.4
08.3	any four from: <ul style="list-style-type: none"> • platelets are small fragments of cells • they stick together to form a blood clot • platelets could stick to wall narrowing blood vessel further • reduces the risk of a blood vessel being blocked further • preventing loss of blood flow to the heart 		4	AO3 4.2.2.3 4.2.2.4
09.1	add Biuret reagent changes from blue to purple (if protein present)		1 1	AO1 4.2.2.1
09.2	too large / insoluble		1	AO3 4.2.2.1
09.3	enzyme had been denatured enzyme's protein structure changed / active site altered lactase can no longer bind to lactose to break it down		1 1 1	AO2 4.2.2.1

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09.4	37.5 °C this was the temperature at which digestion took the least time	accept 35–40 °C	1 1	AO3 4.2.2.1
10.1	1.29 h / 1.3 h / 1 h 18 min	award 1 mark for $\frac{36}{700} = 0.051$ award 2 marks for $0.051 \times 25 = 1.29$	3	AO1 AO2 4.1.2.2 MS 3dd
10.2	any four from: Stage 1 <ul style="list-style-type: none"> • DNA replicates • cell grows bigger • increase in the number of subcellular components / mitochondria / ribosomes / other named component Stage 2 <ul style="list-style-type: none"> • mitosis • chromosomes line up in the middle of the cell in pairs • one set of chromosomes is pulled to each side of the cell Stage 3 <ul style="list-style-type: none"> • cell divides into two 	to achieve 4 marks, answer should include information from all parts of the cell cycle	4	AO1 4.1.2.2