AQA GCSE Biology | 8461

SPECIFICATION POINT 4.2.2.4

Coronary heart disease: a non-communicable disease

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**21**
Available paper years	**2007–2025**

Using this booklet

1. Booklet answer numbers match the question booklet.
2. Use the original question number within marking tables.
3. Examiner comments are included where available.

Name: _____ **Date:** _____

Where a precise marking extract is unavailable, the full source document is included in an appendix. Any missing mark scheme is explicitly identified.

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 01 · Mark scheme January 2007 | BLY1F | Original Q4 | Legacy

Question 4

	answers	extra information	mark
(a)	antibodies		1
	antitoxins		1
	antibiotics		1
(b)	any **two** from: • measles • mumps • rubella / German measles		2
(c)	less / low / no chance of getting named / all condition(s) if vaccinated		1
	quantitative figure(s) e.g. 5 times less likely to get convulsions	must be comparative	1
(d)	enzymes		1
	genes		1
total			9

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 02 · Mark scheme January 2007 | BLY1F | Original Q6 | Legacy

Question 6

	answers	extra information	mark
(a)	being overweight	do **not** accept fat unqualified allow BMI over 25	1
(b)(i)	rose by 8% / from 16% to 24% / by 50% / rapidly then more slowly		1 1
(ii)	any **two** reasonable suggestions e.g. less active more food / take-aways / fast food	accept e.g.s like fewer jobs / more cars / less physically demanding employment OWTTE	1 1
(c)(i)	high (blood) cholesterol	do **not** accept combination of 2 labels ignore references to LDL and HDL	1
(ii)	answer in range 8-17 inclusive		1
(iii)	some deaths related to more than one factor		1
total			8

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 03 · Mark scheme

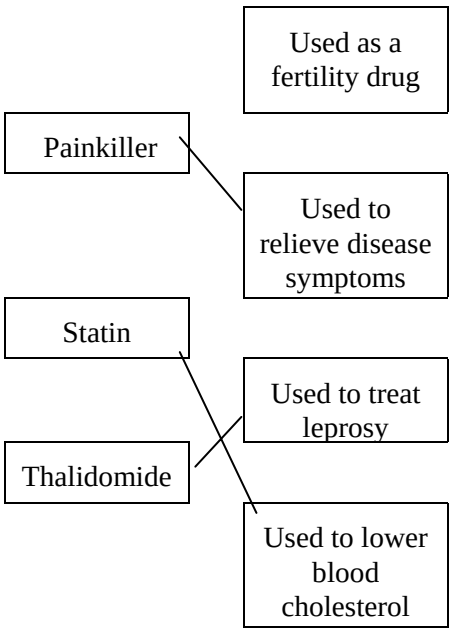
March 2008 | BLY1AP | Original Q2 | Legacy

Two	**A**	cannabis	**2**
	B	painkiller	**4**
	C	antibiotic	**1**
	D	statin	**3**

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 04 · Mark scheme

January 2010 | BLY1F | Original Q5 | Legacy

question	answers	extra information	mark
5(a)		all three correct = **3** marks two correct = **2** marks one correct = **1** mark extra line from a statement cancels the mark	3
5(b)(i)	8		1
5(b)(ii)	3210		1
5(c)(i)	if it is toxic		1
5(c)(ii)	if it has side effects		1
Total			**7**

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 04 · Mark scheme January 2010 | BLY1F | Original Q5 | Legacy

BLY1F

Answer 05 · Mark scheme June 2010 | BLY1AP | Original Q1 | Legacy

Question	Key		
One	**A**	used to treat a headache	2
	B	used to treat infections	1
	C	used to treat leprosy	4
	D	used to treat high cholesterol	3

Answer 06 · Mark scheme March 2011 | BLY1AP | Original Q1 | Legacy

Question	Key		
One	**A**	cocaine	**3**
	B	nicotine	**2**
	C	statin	**4**
	D	thalidomide	**1**

Answer 07 · Mark scheme June 2011 | BLY1AP | Original Q1 | Legacy

Question	Key		
One	**A**	statins	3
	B	painkillers	4
	C	heroin and cocaine	2
	D	tobacco and alcohol	1

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 08 · Mark scheme

June 2011 | BLY1F | Original Q8 | Legacy

Question 8

question	answers	extra information	mark
8(a)	any **two** from: • (high) CRP / protein • (no) heart condition • (not high) LDL • over 50 / age • number of tablets (each day)	allow health ignore time ignore placebo / rosuvastatin ignore number of people	2
8(b)	any **one** from: • tablet with no drug • tablet that has no effect • tablet without chemicals • tablet that people thought contained statin **or** reference to psychological effect	allow fake (pill) / dummy (pill) / sugar / chalk (pill) allow drug that has no effect ignore vitamin / mineral pill ignore control / different statin	1
8(c)	17802 / large number of people **or** enough people	ignore control group / fair test / control variables ignore time / repeats	1

Question 8 continues on the next page

Question 8 continued . . .

question	answers	extra information	mark
8(d)	any **one** from: • placebo group at risk of heart attack **or** to allow statin to be given to everyone • statin group 54% less likely to get heart attack **or** showed that statin worked **or** showed trial (very) successful • sufficient information gained / results conclusive • unethical / unfair to carry on trial	ignore cost ignore reliable ignore got results early	1
8(e)	to avoid bias **or** show impartiality **or** show results independent	allow manufacturers could cheat ignore reliability ignore could be sued / blamed if trial went wrong ignore manufacturer would know which group got statin / placebo	1
8(f)	any **two** from: • reduction in LDL • reduction in (saturated) fats • reduces deposition of fat / cholesterol / LDL in walls of blood vessels **or** blood vessels less likely to be blocked with fat / cholesterol / LDL	allow improves LDL:HDL balance **or** LDL and HDL concentrations equal ignore less cholesterol ignore more HDL do **not** accept less HDL	2
Total			**8**

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 08 · Mark scheme

June 2011 | BLY1F | Original Q8 | Legacy

BLY1F

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 09 · Mark scheme

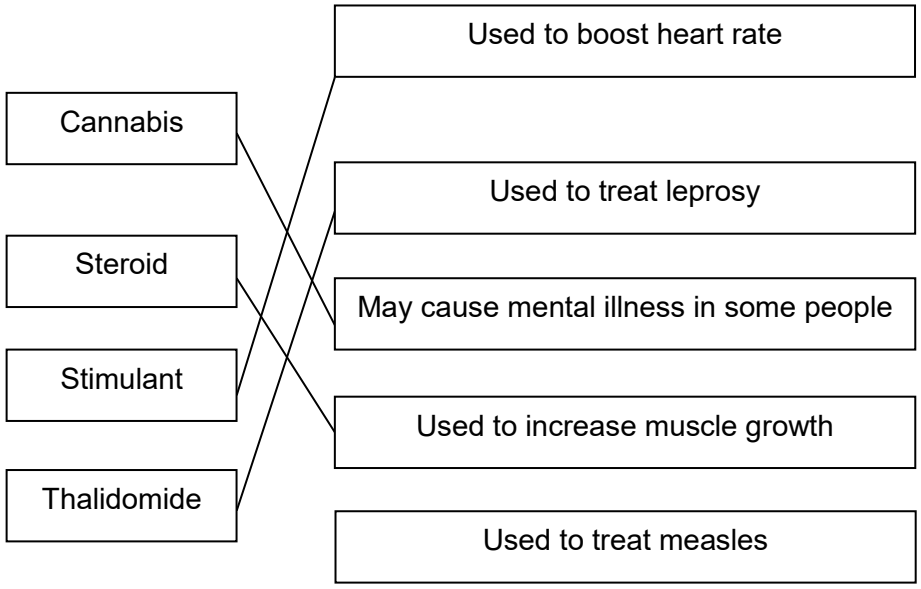
June 2013 | BL3FP | Original Q5 | Legacy

Question 5

question	answers	extra information	mark
5(a)	**A** artery	allow aorta	1
	B ventricle	ignore references to left and right	1
	C atrium	ignore references to left and right allow atria	1
	D vein	allow vena cava	1
5(b)(i)	stent		1
5(b)(ii)	keeps (artery) open		1
	so (more) blood can flow through	allow blood can flow (more) easily ignore ref to blood clots	1
Total			**7**

4.2.2.4 Coronary heart disease: a non-communicable disease

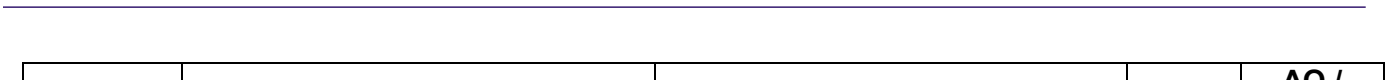
Answer 10 · Mark scheme June 2014 | BL1FP | Original Q4 | Legacy

Question	Answers	Extra information	Mark	AO / spec ref.
4(a)	 extra line from any drug cancels that mark		4	AO1 1.3.1d,f,i
4(b)(i)	any **one** from: • (live) animals • cells • tissues	accept named examples, eg mice ignore people / volunteers do **not** allow plants	1	AO1 1.3.1b
4(b)(ii)	to check that the drug works to find the best dose to use		1 1	AO1 1.3.1b
4(b)(iii)	only scientists at the drug company		1	AO2 1.3.1b
4(c)(i)	420		1	AO2 1.3.1
4(c)(ii)	statin(s)		1	AO3 1.3.1
4(c)(iii)	any **one** from: • side effects • other medication • other (medical) conditions	allow cost allow patient choice allow family history **or** age	1	AO3 1.3.1
Total			**11**	

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 10 · Mark scheme

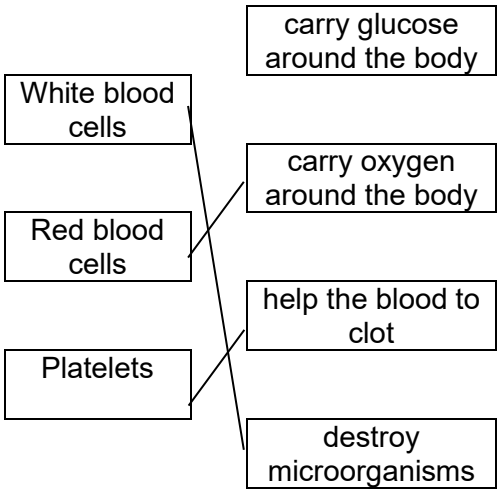
June 2014 | BL1FP | Original Q4 | Legacy



4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 11 · Mark scheme

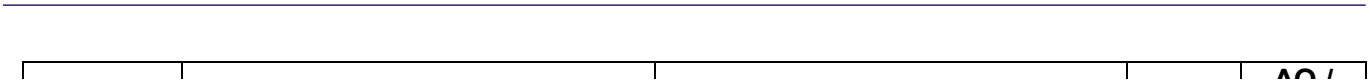
June 2014 | BL3FP | Original Q1 | Legacy

Question	Answers	Extra information	Mark	AO / spec ref.
1(a)(i)		one mark for each line extra line negates a mark	3	AO1 3.2.2c, d,e
1(a)(ii)	any **one** from: • carbon dioxide / CO_2 • urea	do **not** allow urine ignore water ignore ions	1	AO1 3.2.2b
1(b)(i)	B		1	AO1 3.2.1d
1(b)(ii)	D		1	AO1 3.2.1d
1(b)(iii)	vein	accept correct named examples	1	AO1 3.2.1e
1(c)(i)	any **one** from: • keeps artery / blood vessel open **or** widens artery / blood vessel • allows (more) blood to heart / cardiac muscle • (allows) blood to flow more easily • allows (more) oxygen to heart / cardiac muscle		1	AO1 3.2.1f
1(c)(ii)	any **two** from: • bleeding • infection • damaging blood vessels • damaging the heart • risk from anaesthetic	allow blood clots	2	AO3 3.2
Total			10	

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 11 · Mark scheme

June 2014 | BL3FP | Original Q1 | Legacy



4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 12 · Mark scheme June 2015 | BL3FP | Original Q8 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
8(a)	any **two** from: • carbon dioxide / CO_2 • urea • protein • water / H_2O • hormones / insulin	ignore food / waste / alcohol / drugs / enzymes ignore glucose and oxygen allow **two** correct hormones for 2 marks allow **two** correct food components for 2 marks allow antibodies allow antitoxins	2	AO1 321a,322b /c,331a
8(b)(i)	plasma platelets		1 1	AO1 322a
8(b)(ii)	(cardiac) muscle	allow muscular	1	AO1 321b

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 12 · Mark scheme

June 2015 | BL3FP | Original Q8 | Legacy

Question	Answers	Extra Information	Mark	AO / Spec. Ref
8(c)			6	AO3 32, 321f

Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 5 and apply a 'best-fit' approach to the marking.

0 marks	Level 1 (1–2 marks)	Level 2 (3–4 marks)	Level 3 (5–6 marks)
No relevant content	There is a description of at least one advantage of the cow tissue valve **or** a description of at least one disadvantage of the cow tissue valve.	There is a description of at least one advantage of the cow tissue valve **and** at least one disadvantage of the cow tissue valve.	There is a description of the advantages and disadvantages of the cow tissue valve **or** a description of several advantages of the cow tissue valve and at least one disadvantage.

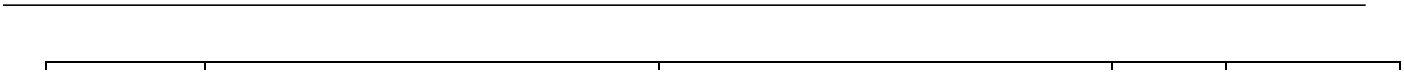
examples of the points made in the response	extra information
Advantages of cow tissue valve: • abundant supply of cows • so shorter waiting time • no need for tissue typing • quicker operation • less invasive **or** shorter recovery time • cheaper operation costs • less operation / anaesthetic risks	ignore information copied directly from the table without value added ignore can take many years to find a suitable human donor
Disadvantages of cow tissue valve: • made from cow so possible objections on religious grounds • new procedure so could be unknown risks • risks of using a stent eg. blood clots, stent breaking or valve tearing • not proven as a long term treatment • may be rejected	ignore ethical arguments allow possible transfer of disease from cow

Total			11

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 12 · Mark scheme

June 2015 | BL3FP | Original Q8 | Legacy



4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 13 · Mark scheme June 2016 | BL1FP | Original Q4 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
4(a)(i)	follicle stimulating hormone / FSH		1	AO1 1.2.2c/d
4(a)(ii)	oestrogen		1	AO1 1.2.2c/d
4(b)(i)	any **one** from: • to help them have a baby / get pregnant • to stimulate egg production / release / maturation • own levels of FSH / LH / hormone (too) low	ignore to make them fertile allow to increase hormone / FSH / LH levels do not allow to increase oestrogen levels	1	AO1 1.2.2e
4(b)(ii)	through the bloodstream		1	AO1 1.2.2b
4(c)	oestrogen progesterone		1 1	AO1 1.2.2e
Total			**6**	

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 13 · Mark scheme

June 2016 | BL1FP | Original Q4 | Legacy

4.2.2.4 Coronary heart disease: a non-communicable disease

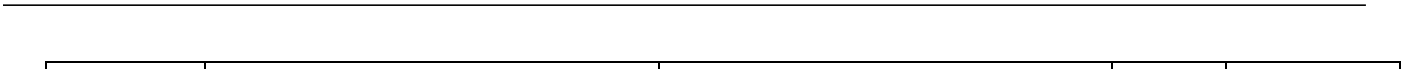
Answer 14 · Mark scheme June 2016 | BL3FP | Original Q3 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
3(a)(i)	any **one** from: • glucose • oxygen • carbon dioxide • urea • water	allow hormones allow named example of a product of digestion	1	AO1 3.2.1a
3(a)(ii)	(cardiac) muscle	allow muscular	1	AO1 3.2.1b
3(b)(i)	**B**		1	AO1 3.2.1d
3(b)(ii)	**D** atrium / atria **E** ventricle(s)	ignore references to left or right ignore references to left or right	1 1	AO1 3.21.c/d
3(c)(i)	a vein		1	AO2 3.2.1e
3(c)(ii)	an artery		1	AO1 3.2.1f
3(c)(iii)	keeps artery open / wider (so) blood / oxygen can pass through (to the heart muscle)	allow ecf from 3cii	1 1	AO1 3.2.1f
Total			**9**	

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 14 · Mark scheme

June 2016 | BL3FP | Original Q3 | Legacy



4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 15 · Mark scheme

June 2017 | BL3FP | Original Q6 | Legacy

Question	Answers	Extra information	Mark	AO / Spec. Ref.
6(a)(i)	left ventricle		1	AO1 3.2.1c
6(a)(ii)	aorta	ignore artery allow aortic (artery)	1	AO1 3.2.1d
6(a)(iii)	(to keep) blood flowing in the right / one direction **or** prevent backflow (of blood)	ignore ref to veins	1	AO1 3.2.1e

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 15 · Mark scheme

June 2017 | BL3FP | Original Q6 | Legacy

6(b)	Reasons for: • less likely to die (44% cf. 59%) • lower risk of death from having a second operation • lower risk of heart infections • less chance of the valve stopping working • longer lasting • doesn't cause rejection • avoids religious issues of using organs from a pig **or** no ethical issue from using part of a living organism Reasons against: • chance of death by bleeding is increased • offers no advantage against clots **or** equal risk of blood clots • have to take anti-clotting drugs for life • can be noisy	max 3 marks if only reasons for or reasons against given allow converse for each point if clearly referring to the pig tissue valve ignore cost allow doesn't stop working allow been used for a longer period of time ignore religion **or** ethical unqualified	4	AO3 3.2

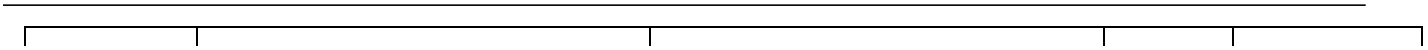
6(c)	(inserted to) keep the (coronary) artery / arteries open allows more blood to flow (to the heart muscle) **or** return blood flow to normal	do **not** allow veins allow (more) glucose / oxygen to reach the heart (muscle)	1 1	AO1 3.2.1f

Total		**9**

4.2.2.4 Coronary heart disease: a non-communicable disease

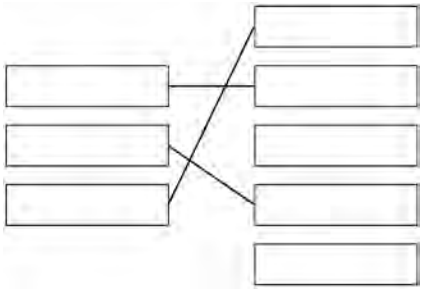
Answer 15 · Mark scheme

June 2017 | BL3FP | Original Q6 | Legacy



4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 16 · Mark scheme June 2018 | 8461/1F | Original Q4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1		additional line from a blood component negates the mark for that component	1 1 1	AO1 4.2.2.3
04.2	C		1	AO3 4.2.2.2
04.3	(vessel) B thick walls **or** thick muscle / elastic tissue **or** lumen is small / narrow	 do **not** accept ref to 'cell walls' allow description of 'lumen'	 1 1	AO1 4.2.2.2
04.4	95		1	AO2 4.2.2.2
04.5	(because coronary) arteries / they are narrower	allow (because the coronary) arteries are blocked / clogged (with fat)	1	AO2 4.2.2.4
04.6	 250 × 60 (= 15 000) **or** 15 000 15	an answer of 15 scores **2** marks allow 0.25 × 60 allow $\frac{\text{answer to marking point 1}}{1000}$ an incorrect conversion to dm^3 in calculation does not negate marking point 1	 1 1	AO2 4.2.2.2

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 16 · Mark scheme

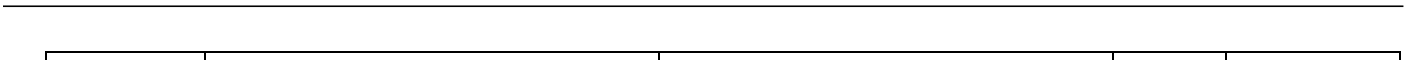
June 2018 | 8461/1F | Original Q4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.7	any **two** from: • no need to stay as long in hospital (after procedure) **or** can go home sooner / same day • not as / less invasive **or** no need for a major operation **or** no need for general anaesthetic • shorter recovery time **or** can get back to normal lifestyle quicker **or** less time needed off work • lower risk of a heart attack (during procedure)	allow only need to stay 2–3 hours in hospital (after procedure) allow less scarring allow less chance of infection allow only a small cut needed allow only 7 days recovery ignore reference to cost ignore idea that it takes less time overall	2	AO3 4.2.2.4
04.8	lower chance of failure (within one year) only need one operation to treat multiple blockages **or** can treat multiple blockages at one time	allow only a 5% chance of failure ignore ref to anaesthetic or CABG being a long-term treatment	1 1	AO3 4.2.2.4
Total			**14**	

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 16 · Mark scheme

June 2018 | 8461/1F | Original Q4



4.2.2.4 Coronary heart disease: a non-communicable disease

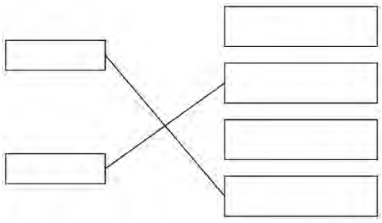
Answer 17 · Mark scheme June 2019 | 8461/1F | Original Q6

06.1	circulatory / circulation (system)	allow cardiovascular (system) ignore blood (system) ignore cardiorespiratory system	1	4.2.2.2 4.2.1 AO1
06.2	any valve ringed 	allow more than one valve separately ringed	1	4.2.2.2 AO1
06.3	prevent backflow (of blood) **or** ensure one-way flow	allow correct description of backflow allow maintains (correct) direction of blood	1	4.2.2.2 4.2.2.4 AO1
06.4	vein	allow correctly named veins	1	4.2.2.2 AO1
06.5	any **two** from: (referring to mechanical valves) • long lasting **or** durable **or** does not break / tear **or** does not wear out • do not need to go into hospital / surgery again • no ethical issues (surrounding use of living / animal tissue) • no risk of rejection • no need for anti-rejection / immunosuppressant drugs • no risk of transmission of disease	allow reliable allow less likely to need a replacement (after 5 years) ignore no need for a replacement	2	4.2.2.4 AO3

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 17 · Mark scheme

June 2019 | 8461/1F | Original Q6

Question	Answers	Extra information	Mark	AO / Spec.Ref.
06.6	no need to take anti-clotting medication	allow can't hear a pig valve allow can get a better fit with a pig valve allow less leaky with a pig valve allow less likely to get a heart attack / stroke ignore will not get blood clots (around the valve)	1	4.2.2.4 AO3
06.7		an additional line from a medical condition negates the mark	2	4.2.2.2 AO1
Total			**9**	

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 17 · Mark scheme

June 2019 | 8461/1F | Original Q6

Question	Answers	Extra information	Mark	AO / Spec. Ref.

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 18 · Mark scheme November 2021 | 8461/1F | Original Q5

05.1	less blood flows through **or** less blood flows to the heart (muscle / cells / tissue) less oxygen (reaches the heart muscle)	 allow less respiration allow less energy released do **not** accept less energy produced / made / created	1 1	AO1 4.2.2.3 4.2.2.4
05.2	D		1	AO3 4.2.2.4
05.3	B		1	AO3 4.2.2.4
05.4	is more likely to get a blockage (with high cholesterol) **or** blockage could be biggest	ignore has the highest blood cholesterol concentration	1	AO2 4.2.2.4
05.5	4 **and** 5.6 $\left(\frac{5.6}{4}\right) = 1.4$	 allow correct division using either 5.3 or 5.8 (for person D)	1 1	AO2 4.2.2.4
05.6	opens / widens (artery) so (more) blood can flow through	allow pushes blockage to the side allow (more) oxygen(ated blood) can flow through	1 1	AO1 4.2.2.4
05.7	platelets		1	AO1 4.2.2.3

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 18 · Mark scheme

November 2021 | 8461/1F | Original Q5

05.8	**Level 2:** A judgement, strongly linked and logically supported by a sufficient range of correct reasons, is given.	3–4	AO3 4.2.2.4
	Level 1: Relevant points are made. They are not logically linked.	1–2	
	No relevant content	0	
	Indicative content: *Advantages:* • **only** have to take the tablet once a day • **only** a tablet so easy to take **or only** a tablet so not painful to take • (drugs are effective so) less likely to get a blood clot • drugs are cheap so less cost to NHS **or** drugs are cheap so (more) people can afford them • drugs have been used for a long time so must be safe / trusted *Disadvantages:* • patients have to make sure they always have a supply of drugs • patients could forget to take the drugs (every day) • patients could still get a blood clot in the first week • restrictions on lifestyle because patients have to have a blood test every few weeks • restrictions on lifestyle because patient can't eat certain foods • patients may get a blood clot if they eat the wrong food • risks associated with puncturing skin / infection • patient may have a fear of needles • higher risk of bleeding / bruising For **Level 2** students must evaluate, including consideration of, the advantage and disadvantage of anti-clotting drugs.		

Total			**14**

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 18 · Mark scheme

November 2021 | 8461/1F | Original Q5

Question	Answers	Extra information	Mark	AO / Spec. Ref.

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 19 · Mark scheme

June 2023 | 8461/1F | Original Q7

Question 7

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.1	A		1	AO1 4.2.2.2

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.2	C		1	AO1 4.2.2.2

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.3	right atrium		1	AO1 4.2.2.2

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.4	any **two** from: • (artery) has a thick**er** muscle (tissue) • (artery) has a thick**er** elastic (tissue) • (artery) has a narrow**er** lumen • (artery) does not contain valves	allow converse if clearly referring to a vein if neither mark awarded allow **1** mark for artery has a thick**er** wall allow description of lumen	2	AO1 4.2.2.2

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 19 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.5	as the percentage of the (coronary) artery that is blocked increases, blood flow decreases	allow converse allow the greater the blockage, the less blood flows allow negative correlation **or** inversely proportional allow as one increases, the other decreases	1	AO2 4.2.2.2

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.6	scale on y-axis	must take up at least 50% of axis	1	AO2 4.2.2.2
	all points plotted	allow 3 or 4 correct plots for **1** mark allow a tolerance of ± ½ small square	2	
	correct curved line of best fit	ignore line joined point to point with straight lines ignore extrapolation	1	

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.7	correct answer from student's line in **Figure 7**	allow a tolerance of ± ½ small square if no line drawn on **Figure 7**, allow a value from 18 to 24 (cm^3/minute)	1	AO3 4.2.2.2

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 19 · Mark scheme

June 2023 | 8461/1F | Original Q7

Question	Answers	Mark	AO / Spec Ref.
07.8	**Level 3**: Relevant points (reasons / causes) are identified, given in detail and logically linked to form a clear account.	5-6	AO1 AO2 4.2.2.2 4.2.2.4 4.4.2.1 4.4.2.2
	Level 2: Relevant points (reasons / causes) are identified, and there are attempts at logical linking. The resulting account is not fully clear.	3-4	
	Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.	1-2	
	No relevant content.	0	
	Indicative content: • reduced blood flow to heart (muscle / tissue / cells) • (so) less oxygen to heart (muscle / tissue / cells) • (so) less glucose to heart (muscle / tissue / cells) • (so) less (aerobic) respiration (in heart / body cells) • (more) anaerobic respiration • (so) less energy (released) • (so) less muscle contraction • (so) less blood / oxygen / glucose around the body (from heart) **or** slower flow of blood / oxygen / glucose to body (from heart) • less carbon dioxide removed from body (muscle / tissue / cells) • (resulting in) breathlessness • (resulting in) tiredness • (anaerobic respiration causes) production of lactic acid • (build-up of lactic acid) causes muscle fatigue / pain **or** chest pain For **Level 3**, students must explain the effect of reduced oxygen / glucose on respiration **or** energy release and its consequence		

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 19 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.9	any **one** pair from:	mark as a pair		AO1 4.2.2.4
	• (insert) stent(s)	allow description	1	
	(to) open (coronary) artery	ignore unblock (coronary) artery	1	
	• (prescribe) statins (1)			
	(to) reduce (blood) cholesterol (1)	allow to slow down the rate of fatty material deposit		
	• heart (and lung) transplant (1)			
	(to) replace the diseased heart with a healthy heart (1)			
	• use an artificial heart (1)			
	(to) keep the patient alive while waiting for a transplant (1)	allow (artificial heart) pumps blood around the body in place of the heart		
	• (artery / heart) bypass (1)	allow description		
	(to) divert blood around the blockage (1)			

Total Question 7	**19**

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 20 · Mark scheme

June 2024 | 8461/1F | Original Q7

Question 7

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.1	arteries		1	AO1 4.2.2.2 4.2.2.4

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.2	pushes / moves blood to get oxygen around the body	 allow description of getting oxygen around the body, such as through blood vessels **or** to get oxygen to a named organ do **not** accept to get oxygen to the lungs ignore reference to restarting the heart ignore reference to the pacemaker	1 1	AO2 4.2.2.2 4.4.2.1

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.3	provides oxygen (for respiration)	allow idea of carbon dioxide triggering breathing to restart	1	AO2 4.2.2.2 4.4.2.1

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.4	statin(s)	allow named statin	1	AO1 4.2.2.4

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 20 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.5	(stent) opens / widens (blocked blood) vessel	allow (stent) keeps (blocked blood) vessel open allow a description of the blood vessel being opened ignore type of blood vessel ignore unblocks (blood) vessel	1	AO1 4.2.2.4
	to allow (more) blood to flow **or** to allow (more) glucose / oxygen to the heart (cells / tissue / muscle)		1	

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.6	any **two** from: • smoking increases the (%) risk of **all** types of (cardiovascular) disease • smoking increases the (%) risk of having (disease) **H** more than any other type of (cardiovascular) disease • smoking increases the (%) risk of having (disease) **E** less than any other type of (cardiovascular) disease	ignore smoking causes (cardiovascular) disease allow not smoking decreases the risk of **all** types of (cardiovascular) disease allow if you smoke, you are **most** likely to get (disease) **H** allow if you smoke, you are **least** likely to get (disease) **E** allow a comparison of the effect of smoking on the risk of two (cardiovascular) diseases allow two comparisons of the effect of smoking on the risk of two (cardiovascular) diseases for **2** marks	2	AO3 4.2.2.6

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 20 · Mark scheme

June 2024 | 8461/1F | Original Q7

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.7	*y*-axis labelled 'Percentage / % increase in risk (compared to people who have never smoked)'		1	AO2 4.2.2.6
	correct scale of 1 cm = 5% on *y*-axis		1	
	all bars plotted correctly	allow a tolerance of ±½ small square ignore bars touching ignore width of bars	1	
	all bars correctly labelled		1	

Question	Answers	Extra information	Mark	AO / Spec Ref.
07.8	any **one** from: • poor diet	ignore obesity allow descriptions of poor diet eg diet high in (saturated) fat / cholesterol ignore diet unqualified	1	AO1 4.2.2.6
	• lack of exercise	allow descriptions of lack of exercise allow high alcohol intake allow other correct lifestyle factors such as having a stressful job		

Total Question 7	14

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 21 · Mark scheme

June 2025 | 8461/1F | Original Q3

Question 3

Question	Answers	Extra information	Mark	AO / Spec Ref.
03.1	pathogens antitoxins	in this order only	1 1	AO1 4.3.1.1 AO1 4.3.1.6 4.2.2.3

Question	Answers	Extra information	Mark	AO / Spec Ref.
03.2	*measurement* 60 (mm) *conversion* 60 000 (µm) *substitution* $= \frac{60\,000}{4\,000}$ *real width* 15 (µm)	allow measurement in the range 59 (mm) to 61 (mm) allow correct conversion from incorrect measurement allow correct substitution using incorrect conversion allow correct calculation using incorrectly converted value	1 1 1 1	AO2 4.1.1.5

Question	Answers	Extra information	Mark	AO / Spec Ref.
03.3	capillary		1	AO3 4.2.2.2 4.2.2.3

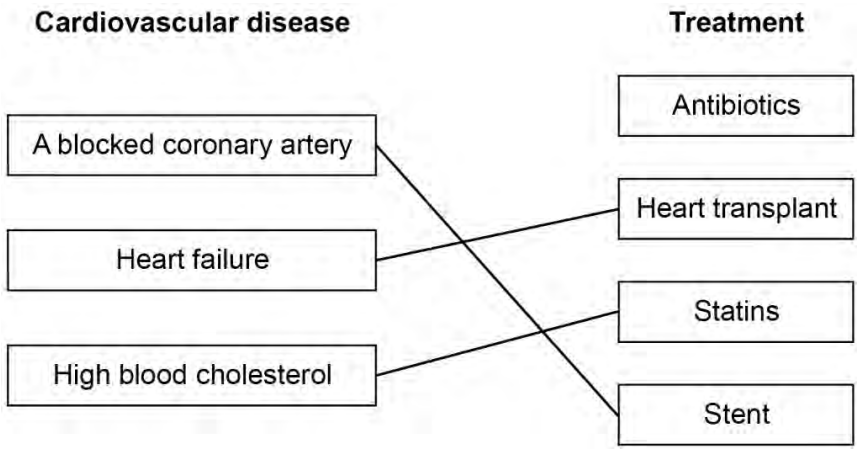
Question	Answers	Extra information	Mark	AO / Spec Ref.
03.4	(blood in arteries) has high pressure (so need thick walls) to withstand / maintain the pressure **or** (so need thick walls) to prevent bursting	ignore to increase the pressure allow **2** marks for to withstand / maintain high pressure	1 1	AO3 4.2.2.2

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 21 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec Ref.
03.5	deposits / build-up / increase of fat(ty material)	allow deposits / build-up / increase of cholesterol allow deposits / build-up / increase of plaque	1	AO1 4.2.2.4

Question	Answers	Extra information	Mark	AO / Spec Ref.
03.6	less / no blood flow (so) less / no oxygen / glucose transported (to heart / body)	 allow **2** marks for less oxygenated blood flows if no other marks awarded allow **1** mark for idea that it will lead to a heart attack	1 1	AO1 4.2.2.4

Question	Answers	Mark	AO / Spec Ref.
03.7	 do **not** accept more than one line from a box on the left	1 1 1	AO1 4.2.2.4

Question	Answers	Extra information	Mark	AO / Spec Ref.
03.8	because it cannot be spread / passed on (from one person to another) **or** because it is not caused by a pathogen / bacterium / virus / fungus / protist / microorganism / microbe	allow not contagious / infectious ignore because it is a lifestyle disease	1	AO2 4.2.2.4

Total Question 3	16

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 19 · Examiner comments

June 2023 | 8461/1F | Original Q7

Question 7 (Standard demand)

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 19 · Examiner comments

June 2023 | 8461/1F | Original Q7

07.1 Nearly 44% of students could identify part A as the part that received oxygenated blood from the lungs.

07.2 Around quarter of students could identify part C as the part that pumps deoxygenated blood to the lungs.

07.3 Approximately 35% of students could identify the right atrium as the part where the pacemaker was found.

07.4 This question was generally attempted well with all of the marking points seen, and just over 38% of students scored the full 2 marks, and a further 22% scoring 1. A common error seen was to fail to use comparative language, for example 'artery has thick muscle' or 'vein has wide lumen'. Commonly seen uncreditworthy responses referred to cell walls, made general reference to the size of the vessels or, occasionally, mis-identified the two vessels completely.

07.5 80% of students were able to describe the trend well, and indeed it appears students are more prepared than in the previous years to describe a trend. Many students did so by using the whole of the headings from the table columns in their answers. A minority of students gained the mark by using the term 'inversely proportional' or 'negative correlation' but this language was rare. Some students negated a correct description of the trend with an incorrect term.

07.6 Only around 6% of students did not attempt to construct the graph, and as such many of the students that attempted gained some marks, with almost 65% scoring 3 or 4 marks. The scale mark was frequently awarded with only a few students squashing it into less than half of the grid available or using strange intervals with a significant number having non-linear scales. The points were well plotted in more than half of responses, with the most frequent error being the failure to spot that they were not evenly spread along the x-axis and therefore plotting them in the wrong places. By far the main stumbling block seemed to be the student's ability to draw a reasonable line of best fit 'free hand', with many still joining point-to-point with a ruler. The most commonly seen errors were points plotted with a large spot or a tiny mark rather than a cross, both of which made it very difficult to judge the accuracy of the plot, or thick, smudged or feathery lines, which again were too inaccurate to be awarded the mark.

07.7 Nearly 44% of students found identifying the correct value at 35 from their own graph challenging and failed to gain the mark. However, over half of students were able to read accurately from their graph even if their line had not been creditworthy. Some effectively drew construction lines but other attempts were in the wrong place, reading from 25 or 30 on the x-axis.

07.8 This levelled response question required students to explain the effect of a partly blocked coronary artery on the human body. This proved a very challenging question for the majority of students, but proved a very good discriminator with only around 1% of students reaching level 3. Over 10% of students made no attempt at this question, whilst a further 20% of students failed to score any marks. Answers generally lacked the specific biological detail required in order to gain marks. Consequently, the majority of student responses were seen at level 1, with around 55% of students gaining 1 or 2 marks. The lack of understanding about the position and function of the coronary arteries was evident, and there were many suggestions that these arteries took the blood to the lungs or around the rest of the body, and reference to blood going through, rather than to the heart. Other students referred only to what normally happens rather than what is happening in this scenario and there were many lengthy responses that mentioned little that was creditworthy apart from a heart attack.

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 19 · Examiner comments

07.9 Almost 30% of students achieved 2 marks on this question, with the most common route to doing so via reference to stents. These students could usually name them (and describe how they are fitted) although some did have to rely on describing them. Statins were also often seen although often without gaining the explanation mark as they were often described as being able to remove / breakdown existing fat deposits. On the rare occasion reference to 'bypass' was encountered, it was generally described quite well along with some reasonable descriptions of how it worked. The most common errors were seen when students opted for surgery to physically open the vessel to remove the blockage. Over 13% of students did not attempt this question, which could be an indicator they ran out of time.

4.2.2.4 Coronary heart disease: a non-communicable disease

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 20 · Examiner comments

Question 7 (standard demand)

07.1 74% of students answered this question correctly.

07.2 Half of the students achieved one mark in this question, with 12% gaining full marks. Many students believed that the principle reason for putting pressure on the heart was to restart the heart first and then to get the blood flowing generally to the lungs to get rid of carbon dioxide and to collect oxygen.

07.3 As was evident in answers to question 07.2, it was clear that many students are confused about the relationship between the heart moving blood through the body and the mechanism of breathing, and many believe that there is a direct dependency of one on the other. As a result, just over half of students gained the mark in this question. Responses were seen that suggested the inflation of the lungs started the heart beating again. Other answers which gained no credit simply repeated the question wording and added no value, by saying that the person's lungs would then 'get air'.

07.4 18% of students were able to recall the term 'statins' from the specification with a number giving answers such as 'blood thinners' or 'anti-cholesterol drugs'. 18% of students left this question blank.

07.5 A third of students achieved full marks in this question, with just over 20% achieving one mark. For the award of the first marking point, the name of the type of blood vessel was ignored as this had already been asked for in question 07.1. Various descriptions of the vessel being opened were acceptable such as it was 'expanded' or the fat was 'pushed to the sides'. Answers referring to 'unblocking' or 'clearing' the vessels, however, were not credited. A few students incorrectly suggested that stents kept the 'valves' or 'heart chambers' open. References to stents 'stopping blood clotting' or to 'keeping the heart beating' were not credited for the second marking point, but were commonly seen.

07.6 80% of students gained no credit in this question and found making conclusions based on the results in Table 5 very difficult. The data showed to what extent the percentage risk of getting four different cardiovascular diseases increased as a result of smoking when compared with people who had never smoked. As a result, all conclusions had to reflect both the increased risk and its association with smoking. They also needed to be comparative, either on the basis of one disease over all others, by using words such as 'most' or 'least', or on the basis of one disease over one other by using words such as 'more' or 'less'. Answers invariably failed to match all of these requirements. Some students also mistakenly believed that the results reflected the 'risk' or 'danger' of the diseases rather than the risk of 'developing' them. Other answers revealed the misconception by some that the letters E to H referred to individual people rather than to the different diseases.

07.7 Students' graph drawing skills were generally good, with 54% of students achieving full marks and 28% achieving three marks. Just 1% of students gained no credit at all. The most commonly omitted feature was the *y*-axis label, and some students truncated their label so much as to omit the reference to 'risk', which was not creditworthy. When marking on their scale, a few students lost track with the middle numbers on the scale they gave.

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4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 20 · Examiner comments — June 2024 | 8461/1F | Original Q7

07.8 53% of students gained credit in this question. The most common incorrect answers were those that lacked qualification, such as references to 'drinking alcohol' or to 'eating fatty foods' which needed the added idea of consumption of these being 'high'. Obesity was a common incorrect answer, as it is not a lifestyle factor.

Answer 21 · Examiner comments — June 2025 | 8461/1F | Original Q3

Question 3 (low demand)

03.1 85% of students scored both marks in this question. The most commonly seen error was confusion between antitoxins and antibiotics.

03.2 Over half of all students scored full marks in this question, with the next most common mark being 3, indicating that the majority of students found this question easy to access. Guidance was provided through the use of scaffolding for each of the steps involved and this allowed many students to access at least 3 marks. A mistake made in one step did not necessarily preclude credit being awarded elsewhere. Common errors included:

- incorrect measurements of the white blood cell, giving answers in cm or inches, or referring to the vertical line rather than to the horizontal line for width.
- incorrectly carrying out the conversion by dividing, rather than multiplying, by 1000
- incorrectly transferring numbers from one step to another by omitting or adding zeros
- using the original pre-conversion width, rather than the calculated one in micrometres, in the final substitution.

03.3 Just under half of all students were able to identify the capillary shown in the figure.

4.2.2.4 Coronary heart disease: a non-communicable disease

Answer 21 · Examiner comments June 2025 | 8461/1F | Original Q3

03.4 Although some students had a clear appreciation of why arteries needed to have thick walls, many (40%) were unable to gain even one mark here. The reasons behind this reflected both a lack of understanding and ineffective expression. MP1 required reference to high pressure, i.e. the conditions that made thick walls essential, and not just to 'pressure' without qualification that the pressure was 'high'. References to volume, rate of flow, direction of flow or the concentration of blood were also not creditworthy. To achieve MP2, responses then had to go on further, with an explanation of what the thick walls allowed or prevented. Responses that did not gain credit here were either:

- too vague, such as 'to stop damage', 'to prevent bleeding' or 'to keep the blood inside'.
- incorrect, such as 'to pump blood around', 'stop backflow' or 'protect from pathogens'.

03.5 10% of students did not attempt this question and a further 60% did not score credit. Many misinterpreted what was being asked for and answered in terms of risk factors, such as 'smoking', outcomes such as 'reduced blood flow' or treatments such as 'stents'. In some cases, responses were too vague to be creditworthy, such as 'blockages occur'. Incorrect answers included 'muscles in the walls contract', 'they shrink' or 'fatty acids build up'.

03.6 Many students gave answers which matched MP1 but fewer gained MP2 and as such, 50% of students scored one mark, with a further 15% scoring two marks. Responses such as 'it will create a blockage', 'it can lead to a reduction (or increase) in blood pressure', 'it causes blood to clot', 'it leads to blood flowing backwards' or 'the vessels are more likely to burst' were either insufficient or incorrect and gained no credit.
A significant number of students gained the fall-back mark by referring to the idea of the narrowed arteries leading to a heart attack.

03.7 Nearly half of all students scored full marks in this question, with the most common being a link between 'high blood cholesterol' and 'antibiotics'. The majority of students correctly associated 'heart failure' with 'heart transplant'.

03.8 Nearly three quarters of students gained credit in this question. Responses which were unable to gain credit included 'it cannot be treated', 'it is caused by the build-up of plaque', 'it has symptoms which are not easy to see' and 'it happens inside the body'.