AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 4.4.2.2

Response to exercise

Mark schemes and examiner comments

Tier	**Higher**
Question groups	**5**
Available paper years	**2019–2024**

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.

4.4.2.2 Response to exercise

Answer 01 · Mark scheme June 2019 | 8464/B/1H | Original Q1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	**B**		1	AO2 4.2.2.2
01.2	right atrium		1	AO1 4.2.2.2
01.3	foxgloves		1	AO1 4.3.1.9
01.4		an answer of 54 (cm^3) scores 3 marks		AO2 4.2.2.2
	X = 2800 / 52		1	
	53.846153		1	
	54 (cm^3)	allow correct rounding of an incorrectly calculated value of stroke volume	1	

4.4.2.2 Response to exercise

Answer 01 · Mark scheme

June 2019 | 8464/B/1H | Original Q1

Question	Answers	Mark	AO / Spec. Ref.
01.5	**Level 3:** Relevant points (reasons / causes) are identified, given in detail and logically linked to form a clear account.	5–6	AO3 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	AO2 AO1
	Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.	1–2	AO1
	No relevant content	0	
	Indicative content effect of exercise • during exercise body needs to transfer (more) energy • energy transferred during respiration • rate of respiration increases during exercise • (so) more oxygen is needed effect of beta blockers • beta blockers reduce (the increase in) heart rate (during exercise) • beta blockers reduce stroke volume (or described) • beta blockers reduce cardiac output • (so) heart cannot supply oxygen fast enough / in sufficient quantity to muscle cells effect on breathing rate • breathing rate increases to increase rate / amount of oxygen absorbed • breathing rate increases to increase rate / amount of carbon dioxide removed from body • (but) increased breathing rate cannot fully compensate for changes in heart function A level 3 response should make links between all three sections of indicative content A level 2 response should attempt to link effect of exercise with oxygen / energy requirement **and** beta blockers to effect on heart function. .		
Total		**12**	

4.4.2.2 Response to exercise

Answer 01 · Mark scheme

June 2019 | 8464/B/1H | Original Q1



4.4.2.2 Response to exercise

Answer 02 · Mark scheme November 2020 | 8464/B/1H | Original Q3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.1	any **one** from: • (Type 2) diabetes • (coronary / ischaemic) heart disease / CHD • high blood pressure • cancer • depression	ignore obesity do **not** accept Type 1 diabetes allow cardiovascular disease ignore heart attack / failure allow (osteo)arthritis	1	AO1 4.2.2.5 4.2.2.6
03.2	$27 = \frac{68.1}{\text{height}^2}$ $\text{height}^2 = 68.1 \div 27$ **or** $\text{height}^2 = 2.522(\text{r}) / 2.52 / 2.5$ height = 1.59 (m)	allow height = $\sqrt{\frac{68.1}{27}}$ **or** allow height = $\sqrt{2.522(\text{r})}$ allow a correctly rounded value if 2.5 is given in step 2 allow an answer of 1.58 (m)	1 1 1	AO2 4.2.2.5 4.2.2.6
03.3	overweight	answer must be consistent with height calculated in **03.2**	1	AO3 4.2.2.5 4.2.2.6

4.4.2.2 Response to exercise

Answer 02 · Mark scheme

November 2020 | 8464/B/1H | Original Q3

03.4		max **2** marks if refer to energy being made / used / produced / created allow reference to calories / joules for energy		AO2 4.2.2.5 4.2.2.6 4.4.2.2 4.4.2.3
	any **three** from:		3	
	• increased energy intake if more food eaten	allow increased energy intake if more fat / carbohydrate eaten allow converse allow energy taken in when you eat		
	• if exercise more, more energy is transferred / released	allow if exercise more, respiration / metabolism increases **or** is faster allow converse allow energy is transferred during exercise do **not** accept energy is burnt during exercise		
	• if more energy is taken in than is transferred body mass increases **or** if less energy is taken in than is transferred body mass decreases	allow if less energy is transferred than is taken in body mass increases **or** if more energy is transferred than is taken in body mass decreases		
	• if energy intake = energy transferred body mass stays the same			
		if no marks are awarded allow **1** mark for food eaten can increase body mass **and** exercise can decrease body mass **or** allow **1** mark for if a lot of food is eaten **and** little exercise is done body mass increases allow converse		

4.4.2.2 Response to exercise

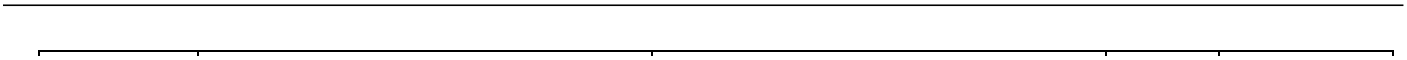
Question	Answers	Mark	AO / Spec. Ref.
03.5	**Level 3:** Relevant points (reasons/causes) are identified, given in detail and logically linked to form a clear account.	5–6	AO1 4.4.2.1 4.4.2.2
	Level 2: Relevant points (reasons/causes) are identified, and there are attempts at logical linking. The resulting 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 **During exercise:** • increased breathing rate • increased breath volume • (to) take in more oxygen for (aerobic) respiration • (and) exhale more carbon dioxide • increased heart rate • (so) increased blood flow (to muscles) • (to) transport oxygen / glucose to respiring cells faster • (and) increase rate of carbon dioxide removal • glycogen converted to glucose • insufficient oxygen supplied (during prolonged vigorous exercise) • (so) lactic acid is formed (during anaerobic respiration) • (and) an oxygen debt is created • (lactic acid causes) muscles become fatigued / tired **or** (causes) muscles to stop contracting efficiently • allow reference to sweating **or** increased body temperature **or** vasodilation (during or after exercise) **After exercise:** • heart rate remains high **or** heart rate slowly decreases • continue to breathe rapidly **or** breathing rate slowly decreases • (to) pay back oxygen debt • oxygen debt is the amount of oxygen needed to break down lactic acid • (and to) provide more oxygen to react with the lactic acid and remove it from cells • (some) lactic acid transported to liver • (lactic acid) is converted back into glucose For Level 3 need reference to: • changes during **and** after exercise • lactic acid **and** its removal.		

Total			14

4.4.2.2 Response to exercise

Answer 02 · Mark scheme

November 2020 | 8464/B/1H | Original Q3



4.4.2.2 Response to exercise

Answer 03 · Mark scheme

November 2021 | 8464/B/1H | Original Q5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	D		1	AO2 4.2.2.2
05.2	C		1	AO3 4.2.2.2
05.3	right atrium → right ventricle → pulmonary artery		1	AO1 4.2.2.2

4.4.2.2 Response to exercise

Answer 03 · Mark scheme

November 2021 | 8464/B/1H | Original Q5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.4	**Level 3:** A judgement, strongly linked and logically supported by a sufficient range of correct reasons, is given.		5–6	AO3
	Level 2: Some logically linked reasons are given. There may also be a simple judgement.		3–4	AO3
	Level 1: Relevant points are made. They are not logically linked.		1–2	AO1
	No relevant content		0	
	Indicative content Advantages of statins • easy to take **or** not invasive (procedure) • decrease blood cholesterol • slow down build-up of fatty materials in arteries • maintain blood flow to heart muscle cells • low cost (compared to stent operation) Disadvantages of statins • might be side effects of drug eg muscle pain • effects take time to happen • drug will need to be taken long term • might forget to take drug Advantages of stent • blocked artery is held open • blood flow to heart muscle cells is increased • stent will remain in place for a long time • effect of stent is immediate • rapid recovery from operation Disadvantages of stent • risk of infection from operation • risk of surgery eg heart attack **or** bleeding • risk of thrombosis **or** blood clot For Level 3, arguments for and against **both** treatments are needed.			4.2.2.4

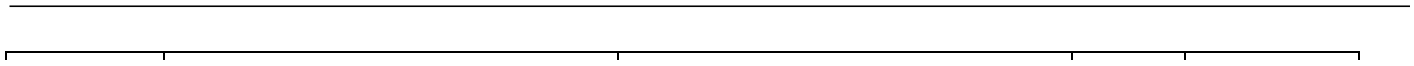
4.4.2.2 Response to exercise

05.5	heart (muscle) cannot contract / pump as effectively / powerfully (so) less blood pumped out of heart **or** to body (on each beat / contraction) (so) less oxygen (reaches cells / body) for (aerobic) respiration (so) breathing rate increases to supply more oxygen **or** (so) breathing rate increases to repay oxygen debt	allow heart (muscle) is not as strong ignore reference to rate of blood flow allow (so) more anaerobic respiration allow (so) breathing rate increases to break down lactic acid	1 1 1 1	AO2 4.2.2.2 4.2.2.4 4.4.2.1
05.6	stem cells are undifferentiated cells (therefore) can form heart (muscle) cells	allow stem cells can differentiate allow stem cells can develop into different types of cell ignore stem cells can become specialised ignore stem cells are not specialised allow (therefore) can form muscle cells	1 1	AO1 AO2 4.1.2.3 4.2.2.4
05.7	any **two** from: • cells will not be rejected • no risk of damage to embryo • adult can give consent	allow converse if clearly referring to embryonic stem cells allow no (potential) human life destroyed / damaged ignore unethical unqualified ignore religion unqualified	2	AO3 4.1.2.3
Total			**17**	

4.4.2.2 Response to exercise

Answer 03 · Mark scheme

November 2021 | 8464/B/1H | Original Q5



4.4.2.2 Response to exercise

Answer 04 · Mark scheme

June 2023 | 8464/B/1H | Original Q1

Question 1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	cancer		1	AO1 4.2.2.7 4.2.2.6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.2	any **one** from: • (coronary) heart disease / CHD / cardiovascular disease • diabetes	ignore cancer allow atherosclerosis ignore heart attack allow high blood pressure allow stroke / asthma / depression / gallstones / (osteo)arthritis allow sleep apnoea	1	AO1 4.2.2.4 4.2.2.5 4.2.2.6

4.4.2.2 Response to exercise

Answer 04 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.3	any **one** from: • taxes on high energy / fat / sugar foods • education (about diet and health) • (government) advertising • restrict media advertising of high energy / fat / sugar foods • information on food labels • help / advice / groups for obese people via the NHS • calorie information on restaurant / takeaway menus • regulation of supermarket offers on high sugar / fat / energy foods • regulation of type of foods for sale near checkouts • exercise campaigns	allow increase the price on high energy / fat / sugar foods	1	AO3 4.2.2.5 4.2.2.6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.4	BMI = $\frac{69}{1.64^2}$	allow BMI = $\frac{69}{1.64 \times 1.64}$ allow BMI = $\frac{69}{2.6896}$	1	AO2
	BMI = 25.6(5437….)	allow 26 or 25.7	1	AO2
	(the person's BMI category is:) overweight	must be consistent with their calculated BMI value	1	AO3 4.2.2.5 4.2.2.6

4.4.2.2 Response to exercise

Answer 04 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.5	any **one** from: • women will gain mass / weight (during pregnancy) • (developing) baby will increase mass / weight of woman	allow BMI (of woman) will increase (during pregnancy)	1	AO3 4.2.2.5 4.2.2.6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.6	any **two** from: • smokers had babies with lower birth mass • women / smokers / non-smokers with higher BMI had heavier babies • smoking had the greatest effect on birth mass in underweight women • smoking had the least effect on birth mass in overweight women • smoking had less effect on birth mass in overweight and obese women (than in underweight and healthy weight women)	statements must be comparative allow converse statements allow weight for mass allow obese women have the heaviest / heavier babies allow underweight women have the lightest / lighter babies allow there is only a 365 g difference between the smallest and largest babies	2	AO3 4.2.2.5 4.2.2.6

4.4.2.2 Response to exercise

Answer 04 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.7	coughs / sneezes (spread virus in droplets)	assume 'it' refers to the virus allow breathing out (spreads virus in droplets)	1	AO1 4.3.1.1 4.3.1.2
	droplets / virus are inhaled	allow droplets / virus are breathed in ignore contact with infected person unqualified allow touch a contaminated surface **and** then touch your mouth / nose / eyes for **1** mark if no other marks awarded allow kissing for **1** mark only	1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.8	$\frac{17}{100}$ × 67 961 900	allow 0.17 x 67 961 900	1	AO2 4.3.1.4
	= 11 553 523	allow 11 553 500	1	

4.4.2.2 Response to exercise

Answer 04 · Mark scheme

June 2023 | 8464/B/1H | Original Q1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.9	any **one** from: • dry feet thoroughly (after washing) • do not share socks / tights / shoes / towels • use a fungicide • do not walk around barefoot in public / contaminated areas	 allow use foot powder ignore keep feet dry ignore wash feet regularly allow named fungicide allow wear silver(-impregnated) socks allow wear flip flops in public / contaminated areas ignore avoid moist conditions	1	AO2 4.3.1.1 4.3.1.4

Total Question 1	14

4.4.2.2 Response to exercise

Answer 05 · Mark scheme

June 2024 | 8464/B/1H | Original Q6

Question 6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1		allow a maximum of **3** marks if the stages are out of order		AO2 4.1.2.2
	DNA replicates **or** two copies of each chromosome form	allow DNA duplicates / doubles allow genetic material doubles ignore genetic information replicates do **not** accept DNA reproduces	1	
	one set of chromosomes is pulled to each end of the cell	allow one set of chromosomes is moved to each end of the cell ignore half the chromosomes are moved to each end of the cell	1	
	nucleus divides	allow two (new) nuclei form	1	
	cytoplasm **or** cell membrane divides **and** two genetically identical cells form	allow cytokinesis **and** two genetically identical cells form ignore names of phases of mitosis if no other mark awarded allow **1** mark for mitosis	1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.2	uncontrolled cell division / growth		1	AO1 4.2.2.7
	invade neighbouring tissues		1	
	(tumour) cells spread to different parts of the body / tissues in the blood / lymph	allow tumour metastasises	1	

4.4.2.2 Response to exercise

Answer 05 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.3	(need to breathe faster / deeper) to get more oxygen	allow the converse if clearly stated	1	AO2 4.2.2.6 4.2.2.2 4.4.2.1 4.4.2.2
	(because) smaller surface area		1	
	(so) less oxygen in the blood	allow (so) less oxygenation of haemoglobin	1	
	(so) less (oxygen for) respiration	allow (so) anaerobic respiration increases allow (so) lactic acid is produced allow (so) an oxygen debt is created do **not** accept energy produced / made / created	1	

Total Question 6	11

4.4.2.2 Response to exercise

Answer 01 · Examiner comments June 2019 | 8464/B/1H | Original Q1

Question 1 (standard demand)

01.1 Around 64% of students correctly identified the blood vessel that carries deoxygenated blood away from the heart to the lungs. The most common incorrect response was vessel C, which carries oxygenated blood away from the heart to the body.

01.2 Around 37% of students knew that pacemaker cells are found in the right atrium. Almost as many students thought that these cells are found in the left ventricle.

01.3 Half of the students knew that digitalis originates from foxgloves. The most common incorrect response was willow.

Answer 01 · Examiner comments June 2019 | 8464/B/1H | Original Q1

01.4 Around 72% of students gained full marks for calculating stroke volume and correctly rounding their answer to two significant figures. More students are showing their working for calculations which helps them achieve compensation marks should their final answer be incorrect.

The first marking point was for reorganisation of the equation. This could be written in words, but writing out the equation as a triangle was not creditworthy. 96% of students gained two or more marks. This was usually for the first two marking points. There were some errors seen in the rounding of the answer, either to 53 or to more than two significant figures.

01.5 Around 13% of students gave a detailed account and achieved Level 3 in this extended response question. They logically linked the effect of beta blockers to the supply of oxygen to respiring muscles, and the need to breathe faster or deeper. Some went on to explain that anaerobic respiration might occur, leading to a build-up of lactic acid and an oxygen debt.

Half of the students were limited to a Level 2 response because they did not explain why the breathing rate would need to increase.

4.4.2.2 Response to exercise

Answer 03 · Examiner comments November 2021 | 8464/B/1H | Original Q5

Question 5 (standard/high and high demand)

This question assessed the understanding of blood flow through the heart and heart attacks. About a third of students identified the blood vessel that transported blood with the highest oxygen concentration into the heart, and a similar proportion identified the vessel which transports blood at the highest pressure. Almost half knew the route of blood flowing through the heart to the lungs.

05.4 was an extended response question, set at high demand, to evaluate the use of statins or a stent to reduce the risk of a heart attack. A quarter of students scored 1 or 2 marks, often stating blood flow to the heart muscle would increase. References to surgery being required for a stent was also seen. Both treatments had to be discussed to move above Level 1. Many students simply repeated the stem of the question, which did not gain any marks, or they mixed up the two treatments. Just over a quarter of students scored 3 marks or above. For Level 3, advantages and disadvantages of both treatments were needed, as well as a judgement.

Few students could explain why people who survive a heart attack get out of breath easily. Three-quarters of students scored zero for this question; a quarter scored 1 mark. This was usually for saying the heart is not as strong after a heart attack. Students did not include enough detail for the other marks, for example they did not link oxygen to respiration.

The last two items were about the use of stem cells to repair damaged heart tissue. Fewer than half the students scored any marks for **05.6**. Most did not understand the difference between differentiation and specialised cells. Just over half the students scored 1 mark for saying that stem cells made from the patient's own cells would be less likely to be rejected, or that they would not involve risking the life of an embryo.

4.4.2.2 Response to exercise

Answer 04 · Examiner comments

June 2023 | 8464/B/1H | Original Q1

Question 1

Question 1 was common to both tiers and was set at standard demand.

01.1 Almost all students on the Higher tier identified cancer as a non-communicable disease.

01.2 Almost all students named a non-communicable disease that obesity is a risk factor for. Diabetes or coronary heart disease, which are both listed in the specification, were the most common responses. References to heart attack or heart conditions were ignored as a named disease was required.

01.3 Fewer than half the students suggested a national policy that could help people to lose weight. The most common suggestions related to increasing taxes on unhealthy foods. This was usually phrased as increase the cost of unhealthy foods. A few suggested decreasing the cost of healthy foods.
Quite a lot of students suggested providing free gym memberships, or more public sports facilities. Some referred to mandatory PE lessons in school. References to labelling the energy content of foods and meals on packaging and menus were also made.
A common mistake was to give lifestyle changes that an individual could make, rather than a policy that a national organisation or the Government could make. Exercise regularly and eat a balanced diet were often stated, but these did not gain credit. Saying increase the recommended amount of daily exercise a person should do would gain credit, as this suggests a national policy.

01.4 In this BMI calculation 1 mark was for the correct substitution into the equation. The second mark was for a correct calculation, which was usually given as 25.65. Most students did show their working, which was good to see. The final mark was for selecting the correct BMI category that matched their final answer. Therefore, if a student did an incorrect calculation, they could still score the third mark. This was sometimes seen if they didn't square 1.64, and gave an answer of 42.07 with the BMI category obese. On the Higher tier the vast majority of students scored full marks.

01.5 Three fifths of students scored the mark for saying that women gain weight when pregnant, or that their mass will increase due to the baby. A clear reference to the weight, mass or BMI of the woman increasing was needed, so saying the woman's weight would change was insufficient. Incorrect responses included saying the BMI category was calculated before the woman became pregnant to check on her health or the baby's health, to see the change in the woman's BMI during pregnancy or for comparison. Some described the harmful effects of smoking on a developing baby, which did not answer the question.

01.6 Two conclusions were needed, so smoking or BMI of the mother had to be linked to the birth mass, or weight, of the babies. Comparative statements were needed. Almost half the students scored both marks, and two fifths scored 1 mark. The most common correct response was that non-smokers had heavier babies. Some students repeated this conclusion, and also stated the converse, saying smokers had lower birth mass babies. These two statements could only score 1 mark. A reference to a healthier weight was often seen, which was insufficient. The main misunderstanding was that smoking affected the woman's mass, and not the birth mass of the baby.

01.7 The first marking point was for how the measles virus is transferred out of an infected person. Two thirds of students scored this mark for saying by coughing or sneezing. The second mark was for how the virus is taken in by a second person. Fewer than a fifth of students scored both marks. Many thought the virus was transferred by direct contact. Some said the virus is airborne, but did not describe how it left one person and entered another.

4.4.2.2 Response to exercise

Answer 04 · Examiner comments June 2023 | 8464/B/1H | Original Q1

01.8 The majority of students scored full marks for the percentage calculation to estimate the number of people with athlete's foot. Some students incorrectly converted 17% to 0.017, rather than to 0.17 Other students calculated 10%, 1% and then 7% of 67 961 900, then added the values for 10% and 7% together to find 17%.

01.9 Fewer than a fifth of students scored a mark for suggesting one way a person could reduce their chance of catching athlete's foot. References to changing socks or washing feet regularly were ignored. Saying keep your feet dry was too vague, a reference to drying feet thoroughly, properly or between the toes after washing was required, which was rarely seen. Use talcum powder was seen occasionally, which was allowed. The idea of covering the feet when walking around at a public swimming pool was suggested by some students, but saying don't walk around barefoot, without qualification, was ignored.

4.4.2.2 Response to exercise

Answer 05 · Examiner comments

June 2024 | 8464/B/1H | Original Q6

Question 6 (standard/high & high demand)

06.1 Many students were only able to gain the single fall-back mark of 'mitosis' for this high-demand question: 62% were only awarded 1 mark, and less than 1% gained all 4 marks.

Use of appropriate terminology proved challenging. It was common to see references to:

- DNA being copied
- genetic information duplicating
- chromosomes duplicating
- 'everything' replicating
- chromosomes doubling
- nucleus replicating.

None of these were sufficient for the first marking point.

Students rarely made any reference to one *set* of chromosomes in their answers, so this mark was rarely awarded.

There were some good descriptions beyond the specification of spindle fibre formation, although it was also common for any description attempted to infer that the chromosomes moved themselves to the poles rather than being pulled.

Students often referred to the nucleus being split, rather than using the term 'divide'; this was not enough to gain the third mark.

Although some good descriptions of cytokinesis were seen, as well as the term itself, marking point 4 was often not credited due to lack of reference to the cells being 'genetically' identical.

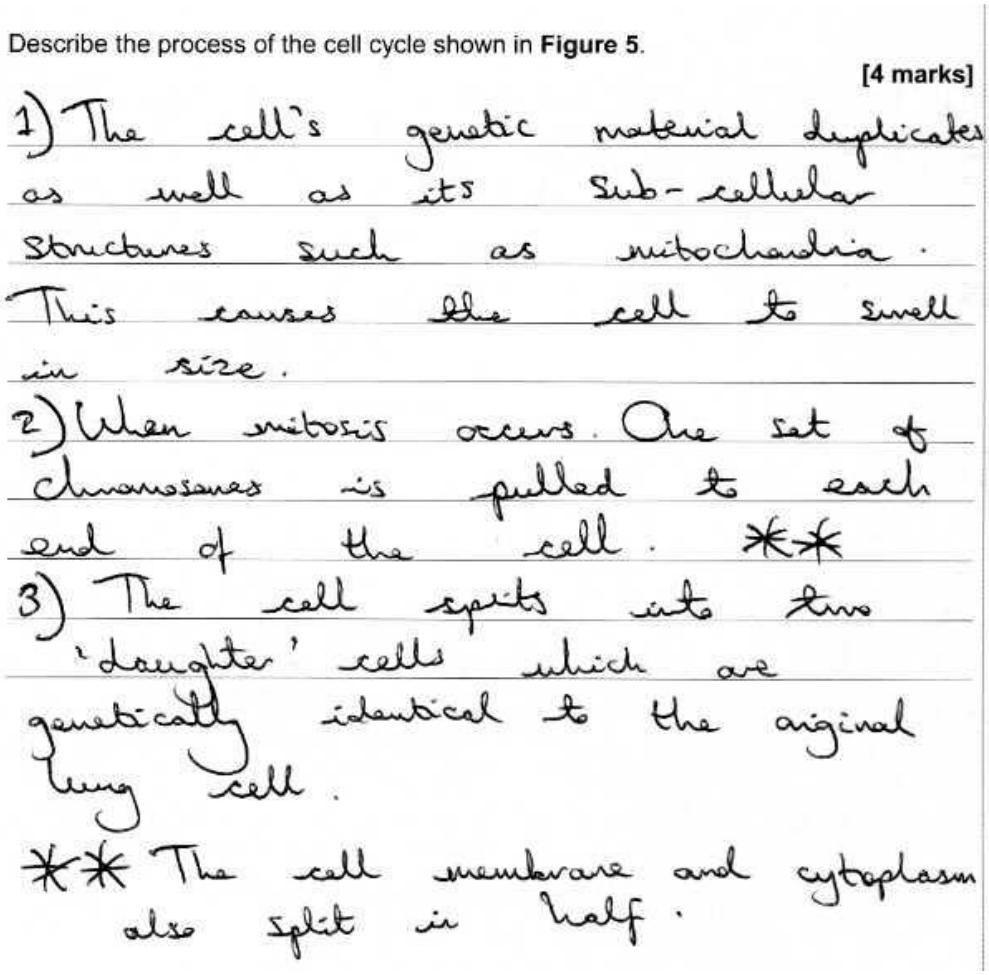
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4.4.2.2 Response to exercise

Answer 05 · Examiner comments June 2024 | 8464/B/1H | Original Q6

Describe the process of the cell cycle shown in **Figure 5**.

[4 marks]



This response gained 3 marks: 1 mark for 'genetic material duplicates' ('genetic information' would not have gained credit), 1 mark for the set of chromosomes being pulled to each end of the cell, and 1 mark for cytoplasm splitting in half (synonymous with dividing) and forming two genetically identical cells. There is no mention of the nucleus dividing.

06.2 Students occasionally referred to uncontrolled division or growth in their answer, which gained them 1 mark. However, many students simply repeated the stem of the question, talking about cancer being malignant, which gained no credit. Many responses stated that the tumour itself spreads through the blood rather than the *cells* spreading or did not make a reference to how the cells were spreading (ie through the blood). It was common to see responses stating that the tumour invades cells rather than tissues. It was rare to see students using the term metastasise. 67% gained no credit on this question.

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4.4.2.2 Response to exercise

Answer 05 · Examiner comments June 2024 | 8464/B/1H | Original Q6

06.3 28% of students were not able to access this question, often giving simple statements rather than being comparative. Some responses did not relate to the question at all: they simply referred to the adaptations of the alveoli for efficient gas exchange.

Marks were most commonly awarded for comparison of surface area, and why the person breathes faster to gain more oxygen.

A very common misconception was that B had a larger surface area than A. Although the general idea of the smaller surface area allowing less oxygen was often seen, many students did not qualify this with there being less oxygen in the blood so could not gain the mark.

Where students correctly identified B as having a smaller surface area, accurate descriptions of how this affected breathing in terms of lactic acid production and oxygen debt were more commonly seen than less respiration.

Many responses still refer to the ‘production of’ energy.