AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 4.5.1

Homeostasis

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**4**
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.

4.5.1 Homeostasis

Answer 01 · Mark scheme June 2019 | 8464/B/2F | Original Q1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	homeostasis		1	AO1 4.5.1
01.2	by hormones by nerve impulses		1 1	AO1 4.5.1 4.5.3.1
01.3	any **one** from: • temperature • (blood) glucose / sugar (concentration)	ignore water allow pH / ions / salts allow oxygen **or** carbon dioxide	1	AO1 4.5.1
01.4	 2000 – 1400 600 (cm^3)	an answer of 600 (cm^3) scores **2** marks allow 800 – 200 if no mark awarded allow (600 + 1000 + 400 =) 2000 for **1** mark	 1 1	AO2 4.5.1
01.5	more sweat (on hot day) cools the body		1 1	AO3 AO2 4.5.1
01.6	 $\frac{750}{3000} \times 100$ 25 (%)	an answer of 25 (%) scores **2** marks	 1 1	AO2 4.5.1
Total			**10**	

4.5.1 Homeostasis

Answer 01 · Mark scheme

June 2019 | 8464/B/2F | Original Q1

4.5.1 Homeostasis

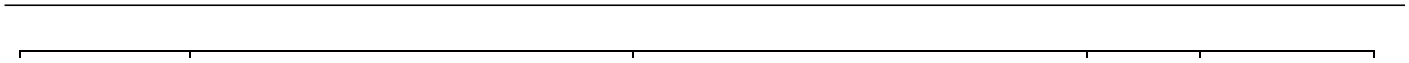
Answer 02 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	controlling water output in urine keeping cool on a hot day		1 1	AO2 4.5.1
04.2	pituitary		1	AO1 4.5.3.1
04.3	(8.4 – 5.2 =) 3.2 (mmol/dm^3)		1	AO2 4.5.3.2
04.4	diabetes	ignore type of diabetes	1	AO3 4.5.3.2
04.5	the pancreas is not releasing insulin		1	AO3 4.5.3.2
04.6	change diet take more exercise	allow description of suitable diet change e.g. use sweetener in hot chocolate, eat less sugary / starchy food or stop eating sugar-coated cereal allow description e.g. go to gym instead of reading and TV, walk / cycle to work allow change to an active job if no other marks awarded allow 1 mark for lose weight.	1 1	AO3 4.5.3.2
Total			8	

4.5.1 Homeostasis

Answer 02 · Mark scheme

November 2020 | 8464/B/2F | Original Q4

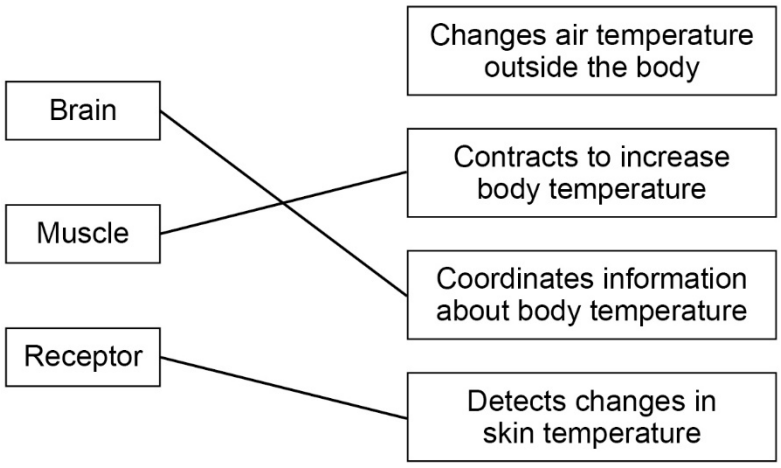


4.5.1 Homeostasis

Answer 03 · Mark scheme

June 2023 | 8464/B/2F | Original Q5

Question 5

Question	Answers	Mark	AO / Spec. Ref.
05.1	 do **not** accept more than one line from a box on the left	1 1 1	AO1 4.5.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.2	to allow cells to function properly to maintain the optimum conditions for enzymes		1 1	AO1 4.5.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.3	(body) temperature decreases (with increasing time)	ignore decreases unqualified	1	AO2 4.5.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.4	37 – 35.5 1.5 (°C)	 ignore minus sign ignore decrease	1 1	AO2 4.5.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.5	suitable extrapolation line on **Figure 6** answer consistent with student's line	 if no extrapolation allow value in range 4.3 to 4.8 allow answer in minutes **or** hours and minutes if units are given	1 1	AO2 AO3 4.5.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.6	pancreas		1	AO1 4.5.3.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.7	endocrine (system)		1	AO1 4.5.3.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.8	decrease		1	AO1 4.5.3.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.9	obesity / overweight	allow any **one** from: • lack of exercise • inactivity • family history (of diabetes) • age • high blood pressure • high cholesterol • race • smoking • high BMI • diet high in carbohydrate / sugar / fat / salt	1	AO1 4.5.3.2

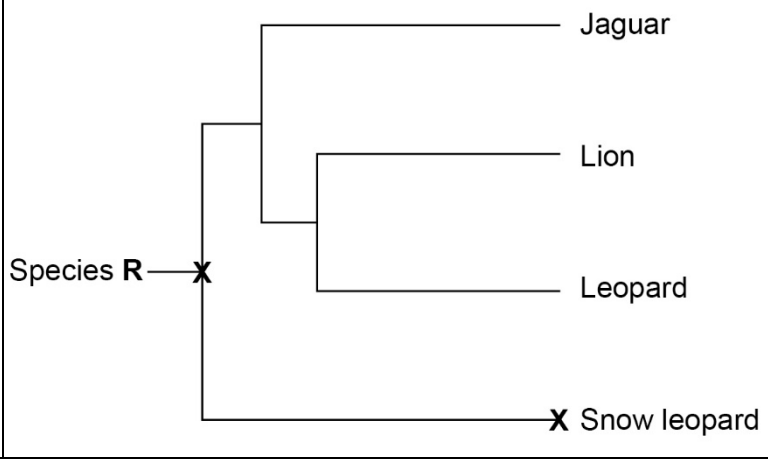
Total Question 5	**14**

Answer 04 · Mark scheme

June 2024 | 8464/B/2F | Original Q4

Question 4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	leopard		1	AO2 4.6.4

Question	Answers	Mark	AO / Spec. Ref.
04.2	a branch / line drawn at any point between 'X' marks, labelled 'tiger(s)'  	1	AO3 4.6.4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.3	a species that the other species evolved from		1	AO3 4.6.4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.4	natural selection		1	AO1 4.6.2.2 4.6.3.1

4.5.1 Homeostasis

Answer 04 · Mark scheme

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.5	any **two** from: • drought • ice age • global warming	if none of these awarded allow **1** mark for climate change ignore weather	2	AO1 4.6.3.3
	• volcanic activity • asteroid collision	if neither of these awarded allow **1** mark for catastrophic event **or** natural disaster		
	• (new) predators	allow named example allow hunters		
	• (new) disease / pathogen	allow named example		
	• competition for food	allow lack of food		
	• competition for mates	allow lack of mates ignore competition unqualified		
	• lack of habitat **or** habitat change	ignore environment change ignore isolation ignore pollution		

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.6	any **one** from: • if species is extinct • if (fossil) species is unknown • evolution is (usually) slow • (fossils) show (evolutionary) change	ignore fossils are (usually) very old	1	AO1 4.6.4 4.6.3.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.7	**(D) → B → A → E → C**	allow **1** mark for link **B → A** allow **1** mark for link **A → E** allow **1** mark for link **E → C**	3	AO2 4.6.3.1 4.6.3.4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.8	antibiotic resistant bacteria will continue to evolve bacteria reproduce very rapidly		1 1	AO3 4.6.3.1 4.6.3.4

Total Question 4	**12**

4.5.1 Homeostasis

Answer 03 · Examiner comments June 2023 | 8464/B/2F | Original Q5

Question 5 (Low and Standard demand)

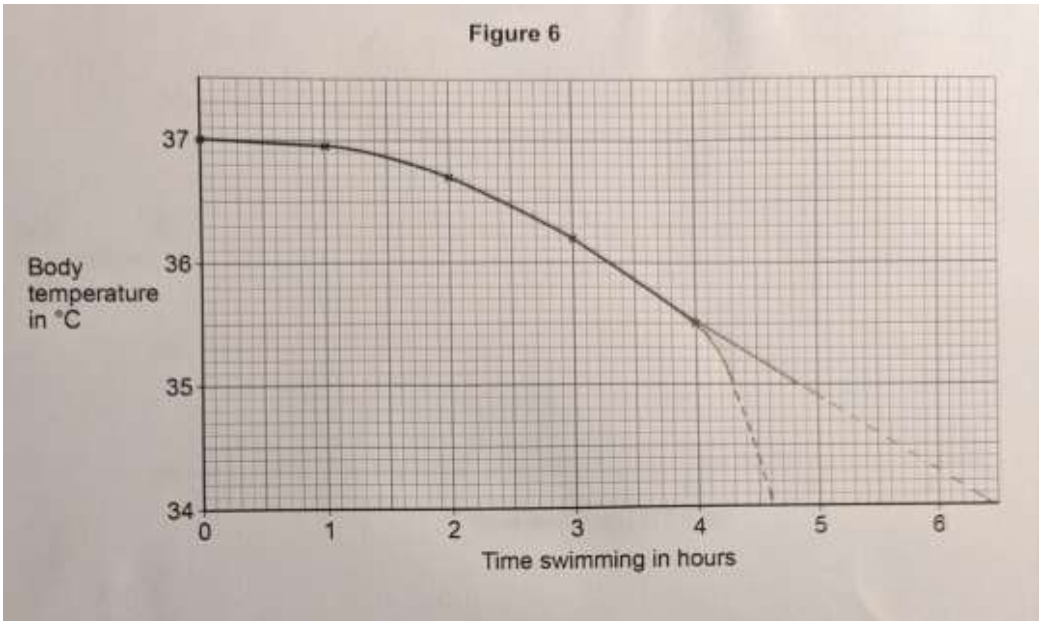
05.1 Most students gained 2 or 3 marks. The most frequent error was to link 'Receptor' with 'Changes air temperature outside the body'.

05.2 40% of students could identify why homeostasis is important.

05.3 Most students could describe the trend as a decrease in temperature. Some students misinterpreted the graph as lower temperature causing longer time.

05.4 Most students could read the relevant values from the graph and subtract the values.

05.5 There was a generous tolerance on extrapolation lines, from appropriately curved to straight.



The illustration above shows the acceptable limits for the extrapolation line, which needed to reach 35 °C. Small imperfections were acceptable, but lines could not be too thick, wobbly or sketchy to allow a reading to be taken. Extrapolation of the line below 35 °C was ignored (as shown by the dashed lines above).

Where extrapolation lines were drawn most were acceptable and gained credit.

The mark scheme for marking point 2 details how this was marked if no extrapolation line was drawn, but in that instance **only** marking point 2 was awarded. Of the large number of students who did not draw a line many still scored a mark for predicting a suitable result, usually 4.5 hours.

Of those who did draw a line about half correctly read their result at 35 °C, and about half gave a different answer of 5 or 6 hours, which did not match to their graph line.

05.6 Most students knew that insulin is produced by the pancreas.

05.7 Very few students knew that the endocrine system is the name of the system involving hormones. Many incorrect answers were seen, such as glands, nervous, reproductive, stomach, capillaries, intestines and brain.

05.8 There was considerable confusion over the function of an increased insulin concentration, with only 55% of students choosing the correct option.

05.9 The most common correct answer was obesity, although the full range of other acceptable responses, as shown in the extra information on the mark scheme, was seen.

Many students misinterpreted the question and believed it was asking for a future risk if a person has Type 2 diabetes. Thus, common responses such as ‘coma’, ‘CHD’ and ‘high blood glucose level’ were frequently seen and did not gain credit.

4.5.1 Homeostasis

Answer 03 · Examiner comments June 2023 | 8464/B/2F | Original Q5

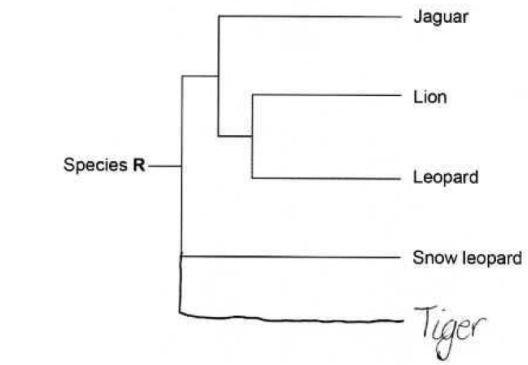
Those that did read the question correctly generally gave ‘obesity’ to gain the mark. Specific types of eating or diets such as those high in fats or sugar were acceptable, but vague terms such as bad / poor / unhealthy diets or ‘eating junk food’ were not accepted.

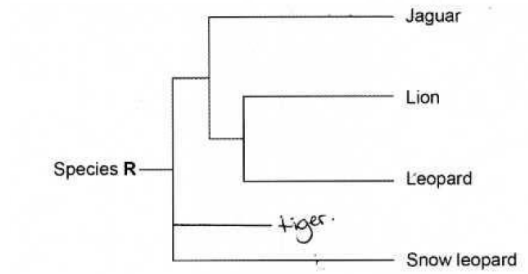
Answer 04 · Examiner comments

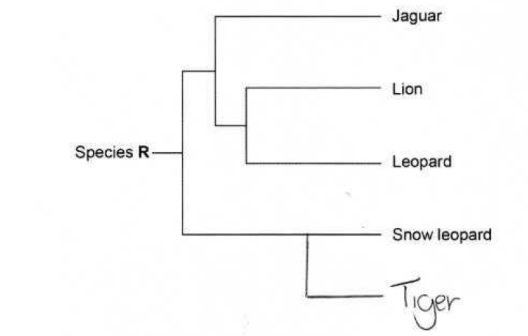
Question 4 (low & standard demand)

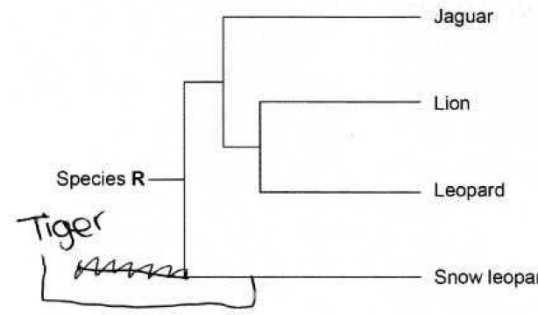
04.1 Most students could interpret the evolutionary tree correctly.

04.2 Most students could add the line and label to the Figure. Students who did not score the mark did not label their line or labelled it incorrectly, 'lion' being frequently used. Other incorrect responses linked their line with other lines on the diagram.







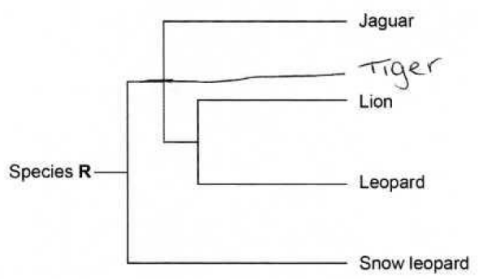


The above examples were correct, even the fourth example despite reading right to left.

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4.5.1 Homeostasis

Answer 04 · Examiner comments June 2024 | 8464/B/2F | Original Q4



This response is incorrect.

04.3 The majority of students could identify what 'species R' represented.

04.4 Most students knew that evolution occurs by the process of natural selection.

04.5 Many students could give two possible causes of extinction. The most common correct responses described predators or lack of food or loss of habitat.

04.6 Most students expressed their answers in line with marking point 1 or marking point 4, with the majority saying to compare old species with those of today or seeing what they used to look like. Alternatively, for the first marking point students responded 'to see what animals there used to be before they became extinct'.

There was confusion evident in answers, with many students referring to what fossils are or references to history, what life was like in the past or how big/old the fossils were. Some students referred to fossils showing the skeletal structure but didn't compare it to the structure of the species today or discuss any change that could be seen between different fossils.

There were also many responses that referred to fossils being hundreds or thousands of years old or giving us knowledge of species that existed thousands of years ago, which is a misconception regarding geological time.

04.7 Rarely did students score 3 marks for this question, indicating that the process of evolution was not clearly understood. Students frequently linked:

- A to E or E to C
- B to A was less frequently linked.

Some students also included D in their responses even though D had already been given as the first stage.

04.8 More than 50% of students gained both marks here. A significant number of students only ticked one box, or ticked more than two boxes.

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