OCR GCSE 21ST CENTURY BIOLOGY B · J257

BIOLOGY



MARK SCHEME

B5.6 WHAT CAN HAPPEN WHEN ORGANS AND CONTROL SYSTEMS STOP WORKING? (FOUNDATION)

SCORE	PERCENTAGE
/32	%

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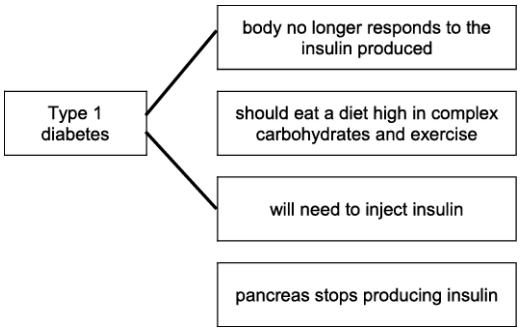
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Question			Answer/Indicative content	Marks	Guidance
1		i	**Any one from** *Descriptions* 1. Person B sugar level falls faster / person A sugar level falls more slowly ✓ 2. Person B sugar level falls back to starting level after just over 2 hours / Person A sugar level remains high ✓ **Any one from** *Reasons why* 3. Person A does not respond to the hormone / insulin produced to convert sugar to glycogen ✓ 4. Person B produces a hormone / insulin in response to the rise in blood sugar and this causes cells to convert the sugar to glycogen so the level falls ✓	2	Max 1 for description and max 1 for the reason why MPs 3 and 4 **DO NOT ALLOW** a reference to hormone response or lack of response without reference to the role of insulin.
		ii		2	Award one mark for each correct line. However, if more than 2 lines are drawn, delete one mark for each incorrect line
			Total	**4**	
2	a		long term memory still works (1) problems with short term memory (1)	2	**Accept** long term better than short-term (2 marks). **Examiner's Comments** The terms long term and short term memory were quite well known.
	b		MRI / CAT / CT scan	1	**Do not accept** X rays. **Examiner's Comments** The question asked for a technique to find areas of the brain which are damaged. MRI and CAT scans were quite well known. Brain scan and just “scan” did not gain marks, nor did answers which involved brain surgery or questioning of the patient.

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Question			Answer/Indicative content	Marks	Guidance
	c		repetition / chunking / pattern / link to stimulus	1	Do not accept write it down unless qualified by repeated. Accept any sensible answer. Examiner's Comments Candidates were required to give a way of remembering a telephone number. Answers which suggested writing it down were not credited. Repetition was the commonest correct response.
			Total	4	

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Question			Answer/Indicative content	Marks	Guidance
3			[Level 3] Answer to include references to high AND low blood sugar and reference to correct treatment. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) [Level 2] Answer to include reference to high / low blood sugar and description of correct treatment. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) [Level 1] Answer to include reference to high / low blood sugar OR reference to treatment. Quality of written communication impedes communication of the science at this level. (1 – 2 marks) [Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)	6	This question is targeted at grades up to C References to high blood sugar may include: • occurs after a meal • insulin lowers glucose • lack of insulin leads to high blood sugar that can lead to unconsciousness References to low blood sugar may include: • occurs when a meal is missed • low blood sugar can lead to unconsciousness • injected too much insulin References to treatment may include: • needs insulin injection • needs sugary drink / injection / food • dietary control (for longer term control) Use the L1, L2, L3 annotations in Scoris; do not use ticks. Examiner's Comments This extended writing question differentiated well. Many candidates understood that insulin had a role in control of blood sugar, however were unsure whether it raised or lowered the level.
			Total	6	

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Question			Answer/Indicative content	Marks	Guidance
4	a		iris ✓ cornea ✓ lens ✓ ciliary muscle ✓	3 (AO 1.1 × 3) 2 (AO 3.3 × 2)	three or four correct = 3 marks two correct = 2 marks one correct = 1 mark Examiner's Comments This question assessed AO1 knowledge in isolation. Most candidates were able to score two marks for identifying the function of the iris and ciliary muscle. There was confusion over the function of the lens and cornea which prevented full marks being credited to more candidates.
	b	i	FIRST CHECK THE ANSWER ONANSWER LINEIf answer = 4.6 (mm) award 2 marks (4.0 +3.8+6.0)/3 ✓ = 4.6 (mm) ✓ OR 13.8/3 ✓ = 4.6 (mm) ✓		Examiner's Comments This question assessed objective AO2. Most candidates were able to correctly calculate the mean, although some demonstrated a correct approach (adding the three values and dividing by 3) without arriving at the correct answer, highlighting the need to check calculations. Some candidates did not know what the term mean meant and gave the median value instead.

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Question			Answer/Indicative content	Marks	Guidance
		ii	6.0 / experiment 3 ✓ because it is far greater than the other two results / it is greater than the range stated ✓	2 (AO 3.1b ✓ 2)	ALLOW outside the range / the other two results are **only** 0.2mm different / too high (compared to the other results) / the other results are between 2 -4mm or within the range IGNORE not closely related / 6.0 (it) is the greatest Examiner's Comments Three quarters of candidates were able to gain one mark for identifying the anomalous result, and around half of candidates were able to give a correct reason, the most common explanation referring to the value of 6.0 mm being outside the range. Some candidates misinterpreted the question and attempted to explain why the anomalous result could have happened. This question assessed objective AO3.
		iii	repeat his experiment again ✓	1 (AO 3.3b)	IGNORE do more experiments / repeat it on different people / another experiment / do it more than once Examiner's Comments Just over a third of candidates were able to answer this question, assessing AO3, successfully, and these candidates were often the ones who went on to score the highest total marks on the paper. Candidates who did not answer correctly suggested that Amir should do his experiment on different people or simply do "more experiments" without making it clear they meant him to repeat this experiment.
		iv	pupil drawn is bigger than that in the first diagram ✓	1 (AO 2.1)	Examiner's Comments This question assessing AO2 was answered particularly well and attempted by almost all candidates.

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Question			Answer/Indicative content	Marks	Guidance
		v	A rapid and involuntary response ✓	1 (AO 1.1)	more than one tick = 0 marks Examiner's Comments This question assessed AO1. Almost all candidates knew that a reflex action is a rapid response, but approximately a quarter did not know what voluntary and involuntary meant in terms of a reflex action and therefore were not able to gain the mark.
		vi	sensory neuron ✓	1 (AO 1.1)	more than one ring = 0 marks Examiner's Comments This question also assessed AO1. Around half of candidates correctly identified sensory neuron, but many thought that the answer was receptor.
	c		Any three from:Amir is long sighted ✓ the light rays do not meet at the retina / the light is not focussed at the retina / light is focussed behind the retina / light rays meet behind the retina ✓ use glasses with convex lenses ✓ they will make the light rays bend more / focus the light or the image on the retina ✓	3 (AO 2.1 × 3)	ALLOW has hyperopia or hypermetropia ALLOW the eyeball is too short / lens is too thin or narrow / light is not refracted or bent enough / lens cannot become round enough DO NOT ALLOW responses that refer to light reflecting in the eye Examiner's Comments Half of candidates gained one or more marks here with more achieving one mark (for identifying Amir as long sighted) than two or three marks. Although some candidates could suggest a correction for the defect, very few were able to explain why Amir was long sighted. Most candidates who did not obtain any marks wrote about wearing glasses or contact lenses or visiting the optician. This question assessed objective AO2.
			Total	14	

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Question			Answer/Indicative content	Marks	Guidance
5			<table><tr><th>both</th><th>type 1</th><th>type 2</th></tr><tr><td>✓</td><td></td><td></td></tr><tr><td></td><td></td><td>✓</td></tr><tr><td>✓</td><td></td><td></td></tr><tr><td></td><td>✓</td><td></td></tr></table>	4 (AO 1.1 × 4)	<u>Examiner's Comments</u> Most candidates scored 1 or 2 marks here, but only approximately 5% of candidates were able to score full marks. This question assesses the depth of candidates' understanding of ideas about type 1 and type 2 diabetes and how they can be treated (B5.6.3), as well as the potential use of stem cells to treat diabetes (B4.5.1).
			Total	4	

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