

A Level OCR Biology

18 Plant and animal responses – answers

Question	Answers	Extra information	Mark	AO Spec reference															
1(a)	E B G A F C D H ✓✓✓✓	If the order is incorrect, award one mark each for <ul style="list-style-type: none"> • E first and H last • B before G • F before C 	4	AO1 5.1.5(l)(i)															
1(b)(i)	<table border="1"> <thead> <tr> <th>Characteristic</th> <th>Skeletal muscle</th> <th>Involuntary smooth muscle</th> </tr> </thead> <tbody> <tr> <td>striated</td> <td>✓</td> <td></td> </tr> <tr> <td>controlled only by the autonomic nervous system</td> <td></td> <td>✓</td> </tr> <tr> <td>attached to tendons</td> <td>✓</td> <td></td> </tr> <tr> <td>contains actin and myosin</td> <td>✓</td> <td>✓</td> </tr> </tbody> </table>	Characteristic	Skeletal muscle	Involuntary smooth muscle	striated	✓		controlled only by the autonomic nervous system		✓	attached to tendons	✓		contains actin and myosin	✓	✓	One mark per correct row	4	AO1 5.1.5(l)(i)
Characteristic	Skeletal muscle	Involuntary smooth muscle																	
striated	✓																		
controlled only by the autonomic nervous system		✓																	
attached to tendons	✓																		
contains actin and myosin	✓	✓																	
1(b)(ii)	trachea / bronchi / bronchioles / blood vessels / digestive system / eyes / bladder / uterus ✓		1	AO1 5.1.5(l)(i) 3.1.1(c)															
1(c)(i)	sarcomere ✓		1	AO2 5.1.5(l)(i) 5.1.5(l)(ii)															
1(c)(ii)	(Y / H zone) shortens during contraction ✓ (because) only myosin / no actin is present at Y / H zone ✓ (during contraction) actin is pulled closer (by myosin) ✓	Accept alternative wording	3	AO2 5.1.5(l)(i) 5.1.5(l)(ii)															

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2(a)	<table border="1"> <thead> <tr> <th>Role</th> <th>Hormone</th> </tr> </thead> <tbody> <tr> <td>causing leaf loss (abscission)</td> <td>ethene / auxin(s)</td> </tr> <tr> <td>controls apical dominance</td> <td>auxin(s)</td> </tr> <tr> <td>seed germination / stem elongation</td> <td>gibberellin</td> </tr> </tbody> </table>	Role	Hormone	causing leaf loss (abscission)	ethene / auxin(s)	controls apical dominance	auxin(s)	seed germination / stem elongation	gibberellin	One mark per correct box	3	AO1 5.1.5(b)
Role	Hormone											
causing leaf loss (abscission)	ethene / auxin(s)											
controls apical dominance	auxin(s)											
seed germination / stem elongation	gibberellin											
2(b)(i)	Any three from: increase sample size / number of pears tested ✓ <i>idea of measure starch concentration at the beginning</i> ✓ use known ethene concentrations (rather than the bananas) ✓ <i>idea of use quantitative measure of starch / reducing sugar concentration</i> ✓ ref. to control variables ✓	e.g., colorimetry e.g., same temperature for all bags	3 max	AO3 5.1.5(e)								
2(b)(ii)	the iodine test is for starch ✓ pears in the control bags / without bananas / without ethene should be less ripe / have more unbroken starch ✓		2	AO3 2.1.2(q) 5.1.5(e)								
2(c)	ref. use of volumetric flask / pipette ✓ dilute 1cm ³ of original solution with 9 cm ³ distilled water ✓ dilute 1cm ³ of new solution with 19 cm ³ distilled water ✓	Accept any realistic 1:9 ratio Accept any realistic 1:19 ratio or a description of a 10-fold dilution followed by a 2-fold dilution Award 2 nd and 3 rd marks for any realistic 200-fold dilution (e.g., 0.1 cm ³ of the original solution added to 19.9 cm ³ of water).	3	AO3 5.1.5(e)								
3(a)	flowering requires more than 6.5 hours of darkness ✓ (but) far-red light reduces the period of darkness required ✓ red light stops flowering ✓ <i>idea that far-red light counteracts/reverses effect of red light</i> ✓	ACCEPT red light increases the period of darkness required	4	AO3 5.1.5(a)(i) 5.1.5(a)(ii)								

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3(b)	<p>Level 3 (5–6 marks) Outlines the use of plant hormones, with correct matching of hormones to functions and few or no errors.</p> <p><i>There is a well-developed line of reasoning, which is clear and logically-structured and uses scientific terminology at an appropriate level. All the information presented is relevant and forms a continuous narrative.</i></p> <p>Level 2 (3–4 marks) Outlines the use of plant hormones, with some errors or omissions.</p> <p><i>There is a line of reasoning presented with some structure and use of appropriate scientific language. The information presented is mostly relevant.</i></p> <p>Level 1 (1–2 marks) Outlines a correct commercial use of a plant hormone.</p> <p><i>The information is communicated with only a little structure. Communication is hampered by the inappropriate use of technical terms.</i></p> <p>0 marks No response or no response worthy of credit.</p>	<p>Indicative content:</p> <ul style="list-style-type: none"> Ethene speeds up ripening Ethene promotes fruit dropping Auxins promote leaf development / slow down leaf fall Auxins slow down fruit dropping at low concentrations Auxins speed up fruit dropping at high concentrations Auxins encourage root growth The use of synthetic auxins as weedkillers Cytokinins delay senescence / ageing Gibberellins delay senescence / ageing Gibberellins speed up seed germination 	6	AO1 5.1.5f
4(a)	<p>Level 3 (5–6 marks) Outlines the organisation of the nervous system into central and peripheral, and somatic and autonomic, with few or no errors.</p> <p><i>There is a well-developed line of reasoning, which is clear and logically-structured and uses scientific terminology at an appropriate level. All the information presented is relevant and forms a continuous narrative.</i></p> <p>Level 2 (3–4 marks) Outlines the organisation of the nervous system into central and peripheral, and somatic and autonomic, with some omissions or errors.</p>	<p>Indicative content:</p> <p><i>Central nervous system</i></p> <ul style="list-style-type: none"> Brain and spinal cord Details of brain or spinal cord structure <p><i>Peripheral nervous system</i></p> <ul style="list-style-type: none"> Sensory and motor neurones Details of effectors and receptors 	6	AO1 5.1.5(g)

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	<p><i>There is a line of reasoning presented with some structure and use of appropriate scientific language. The information presented is mostly relevant.</i></p> <p>Level 1 (1–2 marks) Outlines the organisation of the nervous system into central and peripheral or somatic and autonomic, with some omissions or errors.</p> <p><i>The information is communicated with only a little structure. Communication is hampered by the inappropriate use of technical terms.</i></p> <p>0 marks No response or no response worthy of credit.</p>	<p><i>Somatic nervous system</i></p> <ul style="list-style-type: none"> • Conscious control • Input from sense organs and output to skeletal muscle <p><i>Autonomic nervous system</i></p> <ul style="list-style-type: none"> • Subconscious control • Input from internal receptors and output to smooth muscle and glands <p>Details of sympathetic and parasympathetic motor systems</p>		
4(b)	<p>Name of A: cerebrum ✓</p> <p>Function of A: speech / learning / reasoning / fine control of movement / emotions / sensory perception / memory / thoughts / voluntary responses ✓</p> <p>Name of B: cerebellum ✓</p> <p>Function of B: (control of) balance / posture ✓</p> <p>Name of C: medulla oblongata ✓</p> <p>Function of C: (named / described) autonomic function ✓</p>	Ignore ‘medulla’ alone	6	AO1 5.1.5(h)
4(c)	<p>Any three from:</p> <p><i>idea of long cell AND to communicate with different parts of the body ✓</i></p> <p><i>dendrites AND to communicate with / form synapses with many other cells / neurones ✓</i></p> <p><i>myelin sheath AND to increase the speed of transmission of nerve impulses ✓</i></p> <p><i>ion channels / pumps AND to establish resting potential / for action potential ✓</i></p> <p><i>idea that synaptic knob is adapted to form a neuromuscular junction ✓</i></p>		3 max	AO1 5.1.3(b) 5.1.3(c)
5(a)	<p>Any two from:</p> <p>innate / no learning required ✓</p> <p>involuntary / does not require complex decision-making ✓</p> <p>stereotyped / always the same ✓</p>	Accept alternative wording	2 max	AO1 5.1.5(i)

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5(b)(i)	Any two from: <i>idea of standardised method to test reflex</i> ✓ gender ✓ health / fitness (of participants) ✓		2 max	AO2 5.1.5(i)
5(b)(ii)	Spearman's rank correlation (coefficient) ✓	Accept Pearson correlation coefficient	1	AO2 5.1.5(i)
5(c)	Any two from: <i>relay neurone has</i> cell body at one end of the cell / nearer dendrites ✓ no connection to receptor ✓ (usually) shorter (length) ✓	Accept sensory neurone has cell body (protruding) between axon and dendron Accept reverse argument for sensory neurone	2 max	AO2 5.1.3(b)
6(a)(i)	sympathetic ✓		1	AO1 5.1.5(j)
6(a)(ii)	Any four from: (vasopressin) binds to receptor on cell surface membrane ✓ activates adenylyl cyclase ✓ converts ATP ✓ to cAMP ✓ enzyme cascade ✓		4 max	AO2 5.1.5(j)

Skills box answers

Question	Answer
Years 9 and 13	0.412
Years 7 and 13	4.064