

Biology A

General Certificate of Secondary Education

Unit **A222/02**: Modules B4, B5, B6 (Higher Tier)

Mark Scheme for June 2011

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Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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Question		Answer	Mark	Guidance
1	a	Lucy (1) Liz (1)	2	accept responses in any order accept any other clear response eg. ticks on diagram
	b	enzymes and molecules/substrates collide / hit each other / owtte (1) enzymes/molecules/substrates have a complimentary/matching/specific shape (1) molecule/substrate fits into the enzyme / active site (1)	3	accept chemicals = molecules accept enzymes have a specific shape so that the substrate/molecule can fit into it = 2 marks accept correctly labelled diagram accept 'go into'
Total			[5]	
2	a	glucose (1)	1	accept any other clear response eg ring on table
	b	pituitary gland (1)	1	accept any other clear response eg tick
	c	any three from: reduces/suppresses ADH (production) / less ADH produced; less water reabsorbed; results in a greater volume/ more produced (of urine); urine is more dilute/ less concentrated;	3	no need to identify links between marking points mark first three points and then stop marking accept more water in urine
Total			[5]	

Question		Answer	Mark	Guidance
3	a	<u>hypothalamus</u> (1)	1	accept phonetic spelling
	b	the blood vessels supplying skin capillaries constrict ; the blood flow through the skin capillaries decreases ; energy loss at the skin surface decreases ;	2	3 correct = 2 marks 1 or 2 correct = 1 mark accept any other clear response eg ticked, underlined
	c	uncontrolled heat gain / positive feedback (1) increase in (body) temperature / gets hotter / too hot / temperature 40°C (1)	2	accept body not able to lose heat (fast enough) / owtte = 1 mark ignore reference to external temperature if temperature is quoted – it must be 40°C or over ignore symptoms / body responses / other causes
Total			[5]	

Question			Answer	Mark	Guidance
4	a		meristem (1)	1	accept phonetic spellings ignore stem cells
	b	i	(plant) hormone (1)	1	accept growth factor/regulator ignore unqualified responses eg a growth-promoting chemical
		ii	stimulates/promotes/encourages <u>root</u> growth (1)	1	
	c		leaves can get more light / owtte (1) increased photosynthesis (plants/it/they/leaves/chloroplasts can) produce more food/glucose (1) to grow (1)	3	ignore references to growing towards the light
Total				[6]	

Question		Answer					Mark	Guidance
5	a						3	5 correct rows = 3 marks 4 correct rows = 2 marks 3 correct rows = 1 mark accept any other clear response eg crosses (if no ticks given), shading
		statement	only mitosis	only meiosis	neither mitosis or meiosis	both mitosis and meiosis		
		The chromosome number in each new cell produced is 39.		✓				
		The new cells become sex cells or gametes.		✓				
		The nucleus is reformed in the cells produced.				✓		
		Two new cells are produced.	✓					
Takes place in muscle cells.	✓							
	b	to prevent numbers doubling at fertilisation / owtte / 39/haploid from each parent and forming 78/diploid when fused/fertilised/in zygote (1)					1	accept embryo = zygote accept to form a full set at fertilisation
		Total					[4]	

Question		Answer	Mark	Guidance
6	a	8 (1)	1	
	b	<p>... have some inactive genes. <input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p> <p>... contains genes that code for nervous ... <input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p> <p>contains copies of the same genes...liver cell. <input checked="" type="checkbox"/> (1)</p>	2	<p>3 correct = 2 marks 1 or 2 correct = 1 mark</p> <p>accept any other clear response eg crosses (if no ticks given), shading</p>
	c	<p>unspecialised/undifferentiated/not specialised; (embryonic) clones; genes;</p>	2	<p>3 correct = 2 marks 1 or 2 correct = 1 mark</p> <p>responses must be in correct sentences</p>
Total			[5]	
7		<p>new (neuron) pathways form (in the brain) / owtte (1)</p> <p>certain pathways (in the brain) are more likely to transmit impulses than others/used more often (1)</p> <p>repetition reinforces/strengthens (new) pathways (1)</p>	3	<p>accept more pathways form/created/accessed/made</p> <p>accept a suitable example of repetition if linked to reinforces/strengthens</p>
Total			[3]	

Question		Answer	Mark	Guidance												
8	a	simple/involuntary/innate/instinctive; any example e.g. baby grasping parent's finger / baby suckling/rooting / moving hand from hot plate/pin prick / coughing / blinking / knee jerk;	1	2 correct = 1 ignore unconditional/automatic reject modified												
	b	<table style="width: 100%; border: none;"> <thead> <tr> <th style="width: 70%;"></th> <th style="width: 15%; text-align: center;">true</th> <th style="width: 15%; text-align: center;">false</th> </tr> </thead> <tbody> <tr> <td>The bell is used as a primary ...</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>The final response does not ...</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>The final response is learned ...</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </tbody> </table>		true	false	The bell is used as a primary ...	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The final response does not ...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The final response is learned ...	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2	3 correct = 2 marks 1 or 2 correct = 1 mark accept any other clear response eg crosses (if no ticks given), shading
	true	false														
The bell is used as a primary ...	<input type="checkbox"/>	<input checked="" type="checkbox"/>														
The final response does not ...	<input checked="" type="checkbox"/>	<input type="checkbox"/>														
The final response is learned ...	<input checked="" type="checkbox"/>	<input type="checkbox"/>														
	c	increases chances of survival (1)	1	accept named example – escaping predators, finding a mate, getting food, finding shelter, birds avoid/select coloured seeds, birds avoiding brightly-coloured insects												
Total			[4]													

Question		Answer	Mark	Guidance
9	a	C, D, E (1) B, (F), A (1)	2	accept B, A, (F) for 1 mark
	b	<u>diffusion</u> (1)	1	
	c	<div style="text-align: right;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> ... binds to the sites where the serotonin ... <input checked="" type="checkbox"/> (1) ... causes the concentration of serotonin ... <input checked="" type="checkbox"/> (1) </div>	2	accept any other clear response eg crosses (if no ticks given), shading
Total			[5]	

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