

Mark Scheme (Results)

November 2010

IGCSE

IGCSE Science (Double Award) (4437) Paper 4H

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November 2010

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IGCSE SCIENCE 4437/4H - November 2010

Question Number	Answer	Mark										
1	<table border="1"> <thead> <tr> <th>Name of structure</th> <th>Order of size</th> </tr> </thead> <tbody> <tr> <td>brain</td> <td>3</td> </tr> <tr> <td>nucleus</td> <td>1</td> </tr> <tr> <td>nervous system</td> <td>4</td> </tr> <tr> <td>nerve cell</td> <td>2</td> </tr> </tbody> </table> <p>4 = 3, 2 = 2 and 1 = 1;;;</p>	Name of structure	Order of size	brain	3	nucleus	1	nervous system	4	nerve cell	2	(3)
Name of structure	Order of size											
brain	3											
nucleus	1											
nervous system	4											
nerve cell	2											

Question Number	Answer	Mark
2	bacteria; decomposition / decomposers / decay; oxygen use; respiration; death of organisms / suffocate; mineral ions / named mineral ion / nutrients; Ignore fertiliser growth of algae /growth of plants / eq; eutrophication;	(5)

Question Number	Answer	Mark
3(a)(i)	iris labelled; pupil labelled; pupil larger in dim light;	(3)

Question Number	Answer	Mark
3(a)(ii)	muscle; 1 name of muscle contracts / shortens / eq;	(2)

Question Number	Answer	Mark
3(a)(iii)	more light / eq; allow sight / to see / get image / eq;	(2)

Question Number	Answer	Mark
3(b)	ciliary muscle; contracts / shortens / eq; suspensory ligaments; slacken / relax / eq; lens; fattens / eq;	(3)

Question Number	Answer	Mark
4(a)	haemoglobin; no nucleus; large surface area; biconcave /concave / doughnut / eq; thin (membrane);	(2)

Question Number	Answer	Mark
4(b)(i)	alternative form of a gene / eq;	(1)

Question Number	Answer	Mark
4(b)(ii)	Nn and Nn; N and n and N and n; NN, Nn, Nn, nn;	(3)

Question Number	Answer	Mark
4(b)(iii)	normal and sickled / eq; R carrier	(1)

Question Number	Answer	Mark
5(a)	increases; levels off / drops by a beat / decreases (at 60) / eq;	(2)

Question Number	Answer	Mark
5(b)	respiration / energy; muscles; oxygen; glucose; adrenaline; (removal of) lactic acid / carbon dioxide;	(4)

Question Number	Answer	Mark
6(a)	fast growing; lots of eggs;	(2)

Question Number	Answer	Mark
6(b)	grows faster than Chinese; Allow less eggs than Chinese	(1)

Question Number	Answer	Mark
6(c)	selective breeding / artificial selection;	(1)

Question Number	Answer	Mark
7(a)(i)	pancreas labelled;	(1)

Question Number	Answer	Mark									
7(a)(ii)	<table border="1"> <thead> <tr> <th>Large molecule</th> <th>Smaller basic unit</th> <th>Enzyme</th> </tr> </thead> <tbody> <tr> <td>lipid / fat;</td> <td>(fatty acids and glycerol)</td> <td>lipase;</td> </tr> <tr> <td>(starch)</td> <td>(maltose)</td> <td>amylase / carbohydrase;</td> </tr> </tbody> </table>	Large molecule	Smaller basic unit	Enzyme	lipid / fat;	(fatty acids and glycerol)	lipase;	(starch)	(maltose)	amylase / carbohydrase;	(3)
Large molecule	Smaller basic unit	Enzyme									
lipid / fat;	(fatty acids and glycerol)	lipase;									
(starch)	(maltose)	amylase / carbohydrase;									

Question Number	Answer	Mark
7(b)	large surface area; microvilli; thin (walls) / one cell thick; absorption / diffusion; capillaries / blood (vessel); flow of blood / carry / transport / eq; maintain concentration gradient / eq; lacteal / lymph (vessel);	(5)

Question Number	Answer	Mark
8(a)(i)	3;	(1)

Question Number	Answer	Mark
8(a)(ii)	(produce) pollen;	(1)

Question Number	Answer	Mark
8(a)(iii)	idea that anthers and stigma not close to each other / eq;	(1)

Question Number	Answer	Mark
8(b)(i)	genetically / DNA; identical;	(2)

Question Number	Answer	Mark
8(b)(ii)	culture; explants; sterile / aseptic; bacteria / microorganisms / pathogens / viruses; divide / multiply / reproduce;	(5)

Question Number	Answer	Mark
9(a)(i)	0.075;; allow one mark for 82 000 or 61.5 in working	(2)

Question Number	Answer	Mark
9(a)(ii)	energy lost / wasted / used; respiration / movement / heat / excretion / egestion / not digested / eq;; Ignore growth	(3)

Question Number	Answer	Mark
9(b)(i)	1999;	(1)

Question Number	Answer	Mark
9(b)(ii)	long chain few people / short chain more people; more energy (loss);	(2)

Question Number	Answer	Mark
10(a)	A Bowman's capsule / renal capsule; B (convoluted/proximal) tubule; C loop of Henle; D collecting duct;	(4)

Question Number	Answer	Mark
10(b)(i)	A;	(1)

Question Number	Answer	Mark
10(b)(ii)	B;	(1)

Question Number	Answer	Mark
10(b)(iii)	D;	(1)

Question Number	Answer	Mark
10(c)(i)	$28/56 \times 100 = 50\%$;; allow 1 mark in working for 56 or 28	(2)

Question Number	Answer	Mark
10(c)(ii)	poisonous / toxic / harmful / eq;	(1)

Question Number	Answer	Mark
10(c)(iii)	respiration / energy;	(1)

Question Number	Answer	Mark
10(c)(iv)	active transport/uptake / selective (reabsorption); against concentration gradient / eq;	(2)

Question Number	Answer	Mark
11(a)	6 H ₂ O; C ₆ H ₁₂ O ₆ ;	(2)

Question Number	Answer	Mark
11(b)	temperature; light intensity; CO ₂ (concentration); Ignore wind / water / eq; Ignore humidity / rain	(2)

Question Number	Answer	Mark
11(c)	day: (more) in / less out; (more) light; photosynthesis; idea faster than respiration; night: (more) out / less in / CO ₂ produced; (less) light; less/no photosynthesis; respiration;	(4)

Question Number	Answer	Mark
12(a)	sweating; loss of heat / evaporation / cools / eq; vasodilation; more blood (to surface) / widening (blood vessels) / eq; hairs lie flat; less insulation / less air trapped / less distance / eq;	(4)

Question Number	Answer	Mark
12(b)	glucose / sugar; water / osmoregulation; salts / eq; Ignore heart rate / pH	(2)

Question Number	Answer	Mark
12(c)	high temperature lowered / too hot, cooled / eq;	(1)

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