

Mark Scheme (Results) Summer 2010

IGCSE

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



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IGCSE SCIENCE DOUBLE AWARD 4437/4H - SUMMER 2010

Question	Answer	Mark
Number		
1(a)(i)	A cell membrane controls what enters/leaves the cell / permeability / holds cell contents / engulf / eq;	
	B cytoplasm (chemical) reactions / respiration / metabolism / synthesis / enzymes / eq;	
	C nucleus; controls (cell activity) / contains DNA/genetic material / eq; Ignore brain	(4)

Question	Answer	Mark
Number		
1(a)(ii)	digestion / breakdown; Ignore destroyed / killed / dissolves / eq; enzymes;	
		(2)

Question	Answer	Mark
Number		
1(b)	lymphocytes / memory cell / plasma cell; antibodies / antitoxins; clump bacteria/pathogen/microorganism / neutralise / eq; lgnore kill/destroy	max
	ignore kiii/ destroy	(2)

Question Number	Answer			Mark
2				
	condition	symptom	organ affected	
	emphysema	poor gas exchange	lung;	
	cataract	cloudy lens	eye;	
	Alzeimer's	loss of memory	brain / CNS;	
	coeliac	poor food absorption	(small) intestine / duodenum / ileum; Ignore gut / large intestine	
	arthritis	swollen joints	(bones)	
	infertility	lack of sperm	testis / eq;	
				(5)

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

Question	Answer		Mark
Number			
3(a)(ii)	respiration; decomposition / decay / eq;	Ignore breathing/combustion/death Ignore decomposers	
			(2)

Question Number	Answer	Mark
3(b)	global warming / greenhouse effect/gas / trap heat / rise in temp / eq; ice caps melting; flooding / rise in sea level; loss of habitat;	max
	loss of food / food chain disruption / loss of biodiversity / loss of organisms / extinction / eq; migration / affects development / eq;	
	desertification / climate change / eq;	(5)

Question	Answer	Mark
Number		
4(a)(i)	<pre>competition / compete;</pre>	max
	minerals / named mineral / nutrient;	
	water;	
	light;	
	carbon dioxide; Ignore space	
		(2)

Question	Answer	Mark
Number		
4(a)(ii)	herbicide / weedkiller / chemical that kills / pull them out /	
	biological control / pesticide / eq;	
	Ignore ploughing / fertiliser / chemicals	
		(1)

Question Answer Number	Mark
4(b)(i) less leaf / less area / less surfac	2 / less chloroplasts / less
chlorophyll / eq; Ignore eat/feed	
(less) light trapped / eq;	
(less) photosynthesis;	(2)

Question	Answer	Mark
Number		
4(b)(ii)	pesticide / insecticide; biological control / introduce predator/parasite / pheromones / sterile males / eq; GM;	(2)

Question Number	Answer	Mark
5(a)	Aa Aa; A a A a;	
	AA Aa Aa aa; brown brown brown albino / 3 brown + 1 albino; allow normal as eq to brown Ignore not albino	
	Ignore genotype descriptions	(4)

Question Number	Answer		Mark
5(b)(i)			
	parent genotypes	number of albino offspring	
	homozygous dominant x homozygous dominant	(none)	
	heterozygous x homozygous recessive	two / 2;	
	heterozygous x heterozygous	one / 1;	
	homozygous recessive x homozygous recessive	four / 4 / all;	
			(3)

Question	Answer	Mark
Number		
5(b)(ii)	easily seen / not camouflaged / cannot hide / eq; predators / eaten / killed / do not survive / selected against / eq; less chance of mating / eq; allow converse	max
		(2)

Question	Answer	Mark
Number		
6(a)(i)	number/how many organisms/animals/plants (of same species) / all the organisms of same species/type; Ignore all the organisms Ignore plants and animals	
	19.1-1 - 1 -1-1111	(1)

Question	Answer	Mark
Number		
6(a)(ii)	(different) populations / (all) the organisms / (all) the animals and plants / species; Ignore groups habitat / ecosystem / area / environment / place / eq;	(2)

Question	Answer	Mark
Number		
6(b)	leaching / eutrophication / eq; soil erosion / flooding / eq; loss of habitat;	
	loss of food / food chain disruption / loss of biodiversity / loss of organisms / migration / loss of species / eq;	
	Ignore global warming / greenhouse effect / ref to CO ₂ / climate change / water cycle / desertification	
		(2)

Question	Answer	Mark
Number		
6(c)	large numbers / eq; quick / fast / eq; identical / clones / no variation / eq; genetic material / gene / allele / DNA; easy to transport / easy to store / eq; produced any time of year / eq;	max
	useful when plants difficult to grow from seed;	(4)

Question Number	Answer	Mark
7	(control) diet / quality / frequency; (control) water quality / oxygen / temperature / waste / eq; (control) predation / nets / eq; (control) disease / parasites / antibiotics / pathogens; Ignore healthier fish selected species / strain / mass / guarantee quality / less variation / eq; Ignore more fish produced no need for boats / easier to catch / guaranteed harvest / eq; less depletion of (wild) fish / less overfishing / no risk of catching other species / eq;	max
		(4)

Question Number	Answer	Mark
8	<pre>vasodilation; arterioles; (blood vessels) dilate / get wider / eq; (more) blood to skin / surface;</pre>	max
	(more) sweat; (more) evaporation / water loss / eq;	
	hair; (erector) muscles relax; (hair) flat / eq; (less) air trapped / less insulation / eq;	
	cooling / heat loss / radiation / convection / eq;	(6)
	allow converse	

Question Number	Answer	Mark
9(a)	single cell / one cell;	(1)

Question Number	Answer	Mark
9(b)(i)	small / microscopic / short distance; large SA/vol ratio;	max
	diffusion;	(2)

Question Number	Answer			Mark
9(b)(ii)				
	Substance	Enter the blood from	Carried by	
	glucose	small intestine / ileum / duodenum / villi nephron / liver;	plasma	
	oxygen	alveoli	red (blood) cells / haemoglobin;	
	adrenaline	adrenal glands	plasma;	
	carbon dioxide / lactic acid;	respiring muscle cells	plasma	
	urea	liver;	plasma	
				(5)

python;	
	(1)
Answer	Mark
mongoose;	(1)
Answer	Mark
reduce beetles / eat beetles / reduce pest / kill beetles / eq; increase (sugar cane) crop / stop beetles eating sugar cane / eq;	
reduce beetles that eat sugar cane = 2	
because beetles eat sugar cane = 1	(2)
Answer	Mark
increase in number / reproduce / eq; eat other organisms / disrupt food chains / not enough beetles for other species to eat / eq; Ignore idea that more beetles eaten	
ignore idea that more beeties eaten	(2)
Answer	Mark
excretory / urinary / urinogenital / osmoregulatory / eq;	(1)
Answer	Mark
C bladder;	
B ureter;	
A uretnra;	(3)
Answer	Mark
semen; Ignore sperm	
urine;	(2)
Answer	Mark
unwilling to donate / eq; need correct match / antigens / eq; allow ref to blood groups	(2)
	Answer Answer reduce beetles / eat beetles / reduce pest / kill beetles / eq; increase (sugar cane) crop / stop beetles eating sugar cane / eq; reduce beetles that eat sugar cane = 2 because beetles eat sugar cane = 1 Answer increase in number / reproduce / eq; eat other organisms / disrupt food chains / not enough beetles for other species to eat / eq; Ignore idea that more beetles eaten Answer excretory / urinary / urinogenital / osmoregulatory / eq; Answer C bladder; B ureter; A urethra; Answer semen; Ignore sperm urine; Answer unwilling to donate / eq;

Question	Answer			Mark		
Number						
12(a)						
	Name of	Source	Function			
	component					
	carbohydrate /					
	starch;	pasta	energy source			
	Ignore glucose					
	and sugar					
	Lipid	fish	energy / insulation / eq;			
	Егріч	11311	chergy / misdiation / eq,			
	protein;	meat	synthesis of enzymes			
	iron	red meat	haemoglobin / red (blood)			
			cells;			
				(4)		
				(4)		

Question	Answer	Mark
Number		
12(b)(i)	C H O / carbon + hydrogen + oxygen;	
		(1)

Question	Answer	Mark
Number		
12(b)(ii)	lipase;	max
	fatty acids / glycerol;	
	bile;	
	emulsification / large drops to small drops / increase surface area	
	/ optimum pH / neutralises acid;	
		(3)

Question Number	Answer					Mark
13						
	Level of illumination	Photosynthesis	Respiration	Amount of oxygen	Amount of carbon dioxide	
	Bright light	high	medium	high	low	
	Low light	medium	medium	medium	medium	
	Darkness	low;	medium;	low;	high;	
						(4)

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