

Mark Scheme (Results)

Summer 2014

Pearson Edexcel GCSE in Biology
(5BI1H) Paper 01

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Question Number	Answer	Mark
1a(i)	A - bacterium	(1)

Question Number	Answer	Acceptable answers	Mark
1a(ii)	A description to include two of the following points: Housefly carries a pathogen (1) housefly lands on (contaminated) faeces/animal waste (1) transfers dysentery /bacteria onto food (1) (infected) food eaten (1)	Ignore references to other types of disease transmission lands on food /infects the food	(2)

Question Number	Answer	Acceptable answers	Mark
1a(iii)	An explanation to include the following points: <u>Hydrochloric</u> acid / <u>HCl</u>(1) in stomach (1) (acid) kills bacteria/ dysentery (1)	Both words needed for mark – stomach acid gets 1 mark for stomach. destroys/breaks down accept correct responses about antibodies/antitoxins for 1 mark	(3)

Question Number	Answer	Acceptable answers	Mark
1(b)	an explanation to include two of the following points: mosquito is a <u>vector</u> (1) carries protozoan/Plasmodium(1) pierces skin (1) transfers (protozoan/<i>Plasmodium</i>) to blood (1)	Accept bites/injects/ sucks blood / feed on blood for pierces skin	(2)

(Total for question 1 = 8 marks)

Question Number	Answer	Acceptable answers	Mark
2(a)(i)	C Protocista		(1)

Question Number	Answer	Acceptable answers	Mark
2(a)(ii)	D nucleus		(1)

Question Number	Answer	Acceptable answers	Mark
2(a)(iii)	(both) contain chloroplasts / chlorophyll	Both can photosynthesise	(1)

Question Number	Answer	Acceptable answers	Mark
2(b)(i)	An explanation linking 3 of the following points: • autotrophs can make their own food (using sunlight) • heterotrophs eat other food • <i>Euglena</i> can make carbohydrates and/or eat carbohydrates • (so are) able to survive in different environments / survive in changing environments	autotrophs photosynthesise accept sugars/nutrients for carbohydrates	(3)

Question Number	Answer	Acceptable answers	Mark
2(b)(ii)	A suggestion including two of the following points: • publish findings in scientific journals • use the peer review process • attend scientific conferences	speaking to other scientists	(2)

(Total for question 2 = 8 marks)

Question Number	Answer	Acceptable answers	Mark
3(a)(i)	C - positive gravitropism		(1)

Question Number	Answer	Acceptable answers	Mark
3(a)(ii)	An explanation to include three of the following points: auxin (1) moves to / on the underside of the plant root (1) inhibits the elongation of root cells (on the underside of the root) (1) cells on upper side continue to elongate (1) making the root grow downwards (1)	Grows towards gravity (1)	(3)

Question Number	Answer	Acceptable answers	Mark
3(a)(iii)	A suggestion to include the following points anchor the plant /make plant stable (1) root can reach water / absorb water / access to mineral ions (1)	Accept nutrients/named mineral ion/ mineral for mineral ions	(2)

Question Number	Answer	Acceptable answers	Mark
3(b)(i)	A suggestion to include the following to see what the shoot should do under normal conditions /to compare the control results with the experimental results (1)		(1)

Question Number	Answer	Acceptable answers	Mark
3(b)(ii)	A explanation to include three of the following: Rebecca's shoot did not curve and Andrew's shoot did curve (1) Rebecca's experiment (black cap will) does not allow light to shine on the tip (1) auxin / plant growth substance will not move (to shaded side of shoot) / is evenly distributed (1) Andrew's experiment jelly will allow auxin / plant growth substance to diffuse /move (through to shaded side) (1) causing cell elongation (1)	auxin is made/found in the tip	(3)

(Total for question 3 = 10 marks)

Question Number	Answer	Acceptable answers	Mark
4(a)(i)	D sebaceous gland		(1)

Question Number	Answer	Acceptable answers	Mark
4(a)(ii)	A description linking two of the following points: the sweat gland releases water / sweat onto (the surface of the skin) (1) the water evaporates (1) by removing heat from the surface of the skin / heat energy lost as latent heat(1)	Accept cooling effect	(2)

Question Number	Answer	Acceptable answers	Mark
4(a)(iii)	An explanation linking two of the following points: the (erector) muscle raises the hair (1) the hair traps air (next to the surface of the skin) (1) this acts as an insulator (1) causing more heat to be retained in the body (1)	Ignore references to hair follicle standing up	(2)

Question Number	Answer	Acceptable answers	Mark
4(b)	A homeostasis		(1)

Question Number	Answer	Acceptable answers	Mark
4(c)	An explanation linking two of the following points: this is the <u>optimum</u> temperature (1) involving enzymes (1) for chemical reactions in the body /metabolic reactions (1) denaturation occurs at higher temperatures / at lower temperatures reactions are slower (1)	Named chemical reactions e.g. digestion	(2)

Question Number	Answer	Acceptable answers	Mark
4(d)	An explanation linking two of the following points: reptiles are poikilothermic / ectothermic(1) they cannot generate heat to maintain their own body temperature (1) (so use the sun) to warm their bodies (1) for chemical reactions to occur (quickly) (1)	use the environment to control body temperature / internal temp is dependent on external temp	(2)

(Total for question 4 = 10 marks)

Question Number	Answer	Acceptable answers	Mark
5a(i)	$\frac{(49 + 64 + 58)}{3}$ or $171 / 3 (1)$ $= 57$	Correct bald answer award 2 marks ecf applies if incorrect total is calculated but divided correctly by 3 for 1 mark	(2)

Question Number	Answer	Acceptable answers	Mark
5a(ii)	An explanation to linking four of the following points: nitrates leaked/leached into river (between the two sites) (1) causing eutrophication (1) algae block light to underwater plants / underwater plants cannot photosynthesise (1) (dead plants / algae) broken down by microorganisms (1) microorganisms respire (1) causing oxygen depletion / less oxygen available for the fish (1)	accept fertiliser for nitrates allow bacteria/decomposers	(4)

Question Number	Indicative Content	Mark
QWC	*5(b) A description to include some of the following points • indicator species used • number of indicator used as an assessment of pollution level Water pollution – polluted • bloodworms / sludgeworms /other named species • their presence signify high water pollution • they can survive in low oxygenated waters Water pollution – clean • freshwater shrimp / stonefly (larvae) / other named species • their presence signify low water pollution • they can only survive in areas of high oxygen (thus low pollution) Air pollution • blackspot fungus found on roses • blackspot fungus grows on roses in unpolluted areas because it is killed by the presence of sulfur dioxide that would be found in polluted air. • lichen – certain types of lichen can survive in polluted areas – so depending on the type of lichen found will be used to assess the pollution level of air	(6) Exp
Level	0	No rewardable content
1	1 – 2	• a limited description of the use of indicator species no names of species needed • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy
2	3 – 4	• a simple description of the assessment of air or water pollution and the name/s of the species used with some idea of the level of pollution they respond to • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy
3	5 – 6	• a detailed description of the assessment of both air and water pollution and the names of indicator species with clear indication of polluted water and/or unpolluted water organisms as well as the response of lichen or blackspot fungus to sulphur dioxide • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors

(Total for question 5 = 12 mark)

Question Number	Answer	Acceptable answers	Mark
6(a)	Genus; Species;	Must be in the correct order	(2)

Question Number	Answer	Acceptable answers	Mark
6(b)	A suggestion including the following points: • rats with the mutation survive to reproduce (1) • pass on the allele which makes the offspring resistant to warfarin (1)	accept breed / produce offspring etc for reproduce accept gene / mutation for allele	(2)

Question Number	Answer	Acceptable answers	Mark									
6(c)	<table border="1"><tr><td></td><td>R</td><td>r</td></tr><tr><td>R</td><td>RR</td><td>Rr</td></tr><tr><td>r</td><td>Rr</td><td>rr</td></tr></table> Correct gametes (1) Correct offspring (1)		R	r	R	RR	Rr	r	Rr	rr	If incorrect gametes are entered into the Punnett square but the offspring for those gametes are correct 1 mark can be awarded as an error carried forward	(2)
	R	r										
R	RR	Rr										
r	Rr	rr										

Question Number		Indicative Content	Mark
QWC	*6(d)	A explanation to include some of the following points • MRSA is a bacterial infection • number of cases increased from 1995 to 2006 • MRSA is resistant to antibiotics • so MRSA infection not easy to treat • number of cases were similar between 2005 and 2007 • antiseptics killed the bacteria • less bacteria were transferred from person to person • number of cases decreased from 2007 • antiseptics kill bacteria on surfaces • causing less infections from MRSA	(6)
Level	0	No rewardable content	
1	1 – 2	• a limited explanation of the graph including correct data reading or the use of antiseptics or antibiotics to kill bacteria/treat MRSA • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy	
2	3 – 4	• a simple explanation of one trend of the graph including correct data reading and the effect of the use of antiseptics or antibiotics to kill bacteria/treat MRSA • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy	
3	5 – 6	• a detailed explanation of at least two trends of the graph linking it to antibiotic resistance and antiseptic programme • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

(Total for question 6 = 12 marks)

Total for paper = 60 marks

