edexcel

Mark Scheme (Results)

Summer 2016

Pearson Edexcel GCSE in Biology (5BI1H) Paper 01 Unit B1: Influences on Life

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- For questions worth more than one mark, the answer column shows how partial credit can be allocated. This has been done by the inclusion of part marks eg (1).
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Quality of Written Communication

Questions which involve the writing of continuous prose will expect candidates to:

- Write legibly, with accurate spelling, grammar and punctuation in order to make the meaning clear
- Select and use a form and style of writing appropriate to purpose and to complex subject matter
- Organise information clearly and coherently, using specialist vocabulary when appropriate.

Full marks will be awarded if the candidate has demonstrated the above abilities.

Questions where QWC is likely to be particularly important are indicated (QWC) in the mark scheme, but this does not preclude others.

Question number	Answer	Notes	Marks
1 (a) (i)	**B** homeostasis		(1)

Question number	Answer	Notes	Marks
1 (a) (ii)	An explanation linking the following: water **evaporates** (1) heat / energy removed (1)	 Accept sweat/oils for water Accept heat released/lost	(2)

Question number	Answer	Notes	Marks
1 (b)	An explanation including three of the following: <u>vasoconstriction</u> / blood vessels narrow/constrict(1) (blood vessels) near to the (surface of the) skin (1) this reduces blood flow (1) so less heat lost by <u>radiation</u> (1)		(3)

Question number	Answer	Notes	Marks
1 (c)	A description linking two of the following: (brain contains the) <u>hypothalamus</u> (1) (brain/hypothalamus) detects changes in temperature (1) by {receiving/sending} information via {nerve endings / sense organs / skin receptors / effectors} (1)		(2)

(Total for Question 1 = 8 marks)

Question number	Answer	Notes	Marks
2 (a)	any value from 22.00 hours to 23.00 hours	accept from 10 pm to 11 pm	(1)

Question number	Answer	Notes	Marks
2 (b)	An explanation linking four of the following: **blood glucose** levels increases (1) (**increased** glucose means) insulin is released (1) (insulin is released) from the pancreas (1) (insulin stimulates the) conversion of glucose into glycogen (1) glycogen is stored in the liver (1)	Accept **glucose** absorbed into the blood	(4)

Question number	Answer	Notes	Marks
2 (c)	An explanation linking **three** of the following points: glycogen levels lower / graph would be flatter (1) a person with type 2 diabetes does release insulin / the amount of insulin released is not enough (1) but <u>cells</u> have become resistant to insulin (1) so no / less glucose is converted to glycogen (1)	Accept <u>cells</u> do not respond to insulin	(3)

(Total for Question 2 = 8 marks)

Question number	Answer	Notes	Marks
3 (a) (i)	**D** positive phototropism		(1)

Question number	Answer	Notes	Marks
3 (a) (ii)	An explanation to include three of the following points: The plant (shoot) has grown towards the sunlight (1) auxin (1) {diffuse / move / collect /more} on shaded side of the shoot (1) **cell elongation** (on the shaded side) (1)	Accept alternatives to grown elongates/bends etc	(3)

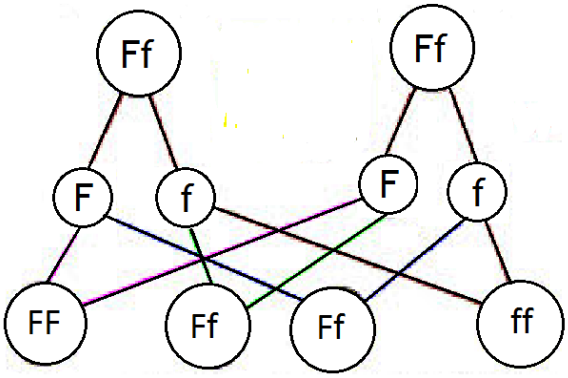
Question number	Answer	Notes	Marks
3 (a) (iii)	An explanation to include two of the following: no light (to tip) (1) tip is where auxin is (produced) (1) (auxin) did not move to shaded side (1)	Accept black cap blocks the light Accept (auxin) evenly distributed in the tip	(2)

Question number	Answer	Notes	Marks
3 (b)	A explanation to include two of the following Acts / used on broad leaf plants (1) overgrowth of weeds (1) due to cell elongation / thinning of cell wall (1) lack of support for weed (1)	 Accept weeds grow too fast OWTTE	(2)

Question number	Answer	Notes	Marks
3 (c)	Any two of the following: rooting powder (1) fruit ripening (1) seedless fruit (1)	 Accept (selective) weedkillers (1)	(2)

(Total for Question 3 = 10 marks)

Question number	Answer	Notes	Marks
4 (a)	**C** ☒ nucleus		(1)

Question number	Answer	Notes	Marks
4 (b) (i)		All correct (2) 2 or 3 correct (1) Accept Ff or fF for heterozygous	(2)

Question number	Answer	Notes	Marks
4 (b)(ii)	**50(%)**	ecf clip with (b) (i)	(1)

Question number	Answer	Notes	Marks
4 (c)	**C** red blood cells		(1)

Question number	Answer	Notes	Marks
4 (d) (i)	A description including (female Anopheles) mosquito / vector(1) sucks blood / bites / injects (1) Plasmodium / malarial protozoan (1)		(2)

Question number	Answer	Notes	Marks
4 (d) (ii)	An explanation linking **three** of the following: In areas where Malaria is prevalent people may die before reproducing (1) People with sickle cell (alleles) live long enough to reproduce (1) Sickle cell (alleles) are passed onto future generations (1) More sickle cell (alleles) in the population (1) As a result of natural selection / survival of the fittest (1)		(3)

(Total for Question 4 = 10 marks)

Question number	Answer	Notes	Marks
5 (a) (i)	A description to include the following: as the mass of nitrate fertiliser increases so does the height of plant (1) correct information quoted from the table about the effect of **different** concentrations (1)		(2)

Question number	Answer	Notes	Marks
5 (a) (ii)	32 ÷ 4 = 8 (1) 58 ÷ 4 = 14.5 (1) 14.5 – 8 = 6.5 (mm per week)	Correct answer 3 marks Accept 58 – 32 = 26 (1) 26 ÷ 4 (1) = 6.5 (mm per week)	(3)

Question number	Answer	Notes	Marks
5 (a) (iii)	protein / enzyme	Accept amino acid	(1)

Question Number		Indicative Content	Mark
QWC	**5b***	A description to include some of the following points Decomposition • decomposers break down dead animals or plants or animal waste • bacteria convert the proteins and urea into ammonia • ammonia released into the soil Nitrification • nitrifying bacteria (*Nitrosomonas*/*Nitrobacter*) • convert ammonia to nitrites • nitrites are then converted into nitrates • available for the plant root to absorb Fixation • nitrogen fixing bacteria (*Rhizobium*) • in soil can fix nitrogen gas from the atmosphere • mutualistic root nodule bacteria • can fix nitrogen gas to nitrogen compounds / ammonia / nitrates • found in leguminous plants Denitrification • denitrifying bacteria • can convert nitrates back into nitrogen gas • this happens when the soil becomes waterlogged • and occurs under anaerobic conditions	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• A limited description of **at least** one stage of the nitrogen cycle • 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 **at least** two stages of the nitrogen cycle • 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 **at least** three stages of the nitrogen cycle including denitrification which removes nitrates from the soil • 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 marks

Question number	Answer	Notes	Marks
6 (a) (i)	**C** *Lycoperdon perlatum*		(1)

Question number	Answer	Notes	Marks
6 (a) (ii)	**A** genus species		(1)

Question number	Answer	Notes	Marks
6 (a) (iii)	A description including the following points: cells have cell walls (1) cells do not have chlorophyll / chloroplasts (1) (organised into) mycelium / hyphae (1) cells have nuclei (1)	Accept: cell wall not made of cellulose / is made of chitin (2)	(2)

Question number	Answer	Notes	Marks
6 (a) (iv)	A description including two of the following points: fungi are saprophytes / saprophytic feeders (1) they feed on dead / decaying organisms (1) extracellular digestion (1)	Accept named fungi such as ringworm as a parasite (1)	(2)

Question Number		Indicative Content	Mark
QWC	***6(b)**	An explanation to include some of the following points: **Variation and competition** • most organisms produce more young than can survive to adulthood • populations have organisms with individuals that differ (slightly) from one another • the struggle for existence means that these organisms compete with each other to survive • they compete for resources e.g. food, shelter, mates **Survival of the fittest and inheritance** • those organisms with the most advantageous characteristics survive • those organisms less well adapted die • those organisms that survive will reproduce • the advantageous characteristics will be passed onto their offspring **Gradual change** • over time more organisms will express the advantageous characteristics / alleles • non-advantageous characteristics / alleles will be lost • species will evolve over time	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited explanation of at least one section above, a simple statement is enough to enter level one • 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 at least two sections above this must link together ideas in a coherent way • 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 all three sections above. The response must refer to the idea of competition between organisms and the idea of survival of the fittest. NB – the candidate may only give one side of the story – e.g. the advantageous characteristics. • 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)

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