Mark Scheme (Results)

Pearson Edexcel

Additional Sample Assessment Materials

GCSE 9-1

Paper 2: Biology 1BI0/2F

First examination 2018

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Summer 2018

General Marking Guidance

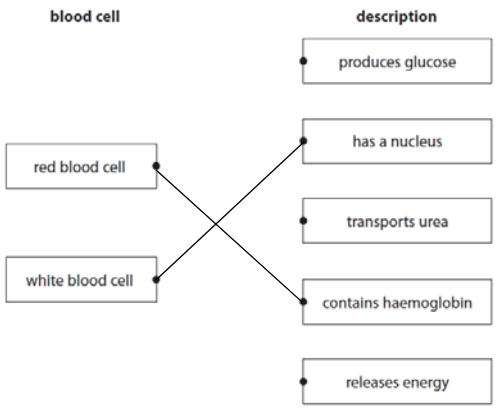
- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should 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.
- 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.

Paper 1BI0_2BF Biology – Mark scheme

Question number	Answer	Additional Guidance	Mark
1(a)(i)	pressure (1) thick (1)	must be in correct order	**(2)**

Question number	Answer	Additional Guidance	Mark
1(a)(ii)	26 ÷ 20 (1) 1.3 (mm)	two marks for correct answer	**(2)**

Question number	Answer	Mark
1(a)(iii)	**B** the aorta transports oxygenated blood away from the heart	**(1)**

Question number	Answer	Mark
1(b)		**(2)**

Question number	Answer	Mark
1(c)	**C** by diffusion	(1)

Total for Question 1 = 8 marks

Question number	Answer	Mark
2(a)	**B** protein synthesis | respiration | support and storage	(1)

Question number	Answer	Mark
2(b)(i)	absorb water / absorb nutrients or minerals / anchorage	(1)

Question number	Answer	Mark
2(b)(ii)	0.06 x 0.24 = 0.0144 / 0.014 / 0.01 (1) mm^2 (1)	(2)

Question number	Answer	Additional Guidance	Mark
2(b)(iii)	An answer that combines the following points of application of knowledge and understanding to provide a logical description: • greater magnification (1) • higher resolution / allows more detail to be seen (1)	accept clearer image	(2)

(Total for question 2 = 6 marks)

Question number	Answer	Mark
3(a)(i)	**B** the cheese decayed more at a higher temperature	(1)

Question number	Answer	Additional Guidance	Mark
3(a)(ii)	type of cheese / size of the cheese cube / surface area of cheese cube / size of the box / age of cheese	accept other valid variables	(1)

Question number	Answer	Additional Guidance	Mark
3(a)(iii)	(oil) prevented oxygen from getting to the cheese	accept the oil is toxic / killed the fungus	(1)

Question number	Answer	Additional Guidance	Mark
3(a)(iv)	An explanation that combines identification – improvement of the experimental procedure (1 mark) and justification / reasoning which must be linked to the improvement (1 mark) • place cheese at a range of temperatures (1) • whilst controlling the other variables/using better quantitative measure of fungal growth (1)	accept named variables	(2)

Question number	Answer	Additional Guidance	Mark
3(b)	An answer that provides a description by making reference to: • place cheese in a solution of ethanol (1) • then mix ethanol with water (1) • turns white/milky to show presence of fat (1)	accept description of grease spot test	**(3)**

(Total for question 3 = 8 marks)

Question number	Answer	Additional Guidance	Mark
4(a)	glucose	ignore sugar	**(1)**

Question number	Answer	Mark
4(b)(i)	Any two from • temperature (1) • light intensity/distance of lamp from beaker (1) • mass of pondweed (1) • total volume of solution (1) • pH (1)	**(2)**

Question number	Answer	Mark
4(b)(ii)	**C** gas syringe	**(1)**

Question number	Answer	Additional Guidance	Mark
4(b)(iii)	An answer that combines points of interpretation / evaluation to provide a logical description: • the volume of gas collected increases up until 20 cm^3 of sodium hydrogencarbonate solution (1) • adding more (than 20 cm^3) sodium hydrogencarbonate solution doesn't increase volume of gas collected (1)	accept until the volume of gas collected reached 6 cm^3 (1)	**(2)**

Question number	Answer	Additional guidance	Mark
4(c)	An explanation that combines identification – application of knowledge (1 mark) and reasoning / justification – application of understanding (1 mark): • shaded side leaves have a larger surface area (1) • to increase / maximise light absorption (for photosynthesis) (1)	accept larger / bigger leaves	**(2)**

Question number	Answer	Mark
4(d)	An answer that provides a description by making reference to two of the following: • that are lignified / dead (1) • hollow (1) • xylem (1)	**(2)**

(Total for question 4 = 10 marks)

Question number	Answer	Mark
5(a)(i)	An answer that combines knowledge (1 mark) and (1 mark) to provide a logical description: • maintain optimal temperature in the body/maintain a constant internal temperature (1) • so that enzymes do not denature/cells are not damaged/enzyme controlled reactions have optimal conditions (1)	**(2)**

Question number	Answer	Mark
5(a)(ii)	An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark): • shivering/muscles contract and relax (1) • to release heat energy (1) OR • erector muscles contract (raising hairs) (1) • trapping an insulating layer of air (1)	**(2)**

Question number	Answer	Mark
5(b)(i)	**A** structure A	**(1)**

Question number	Answer	Additional guidance	Mark
5(b)(ii)	An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark): • by filtration (1) • high pressure forces small molecules into the Bowman's capsule (1)	accept ultrafiltration	**(2)**

Question number	Answer	Mark
5(c)(i)	they have two kidneys / they can survive with one kidney	**(1)**

Question number	Answer	Additional Guidance	Mark
5(c)(ii)	An answer that combines the following points of application of knowledge and understanding to provide a logical description: • no/less urea (1) • balanced water content of the blood / osmoregulation (1)	accept differences in ion concentration	**(2)**

(Total for question 5 = 10 marks)

Question number	Answer	Additional Guidance	Mark
6(a)(i)	7 x 0.2 (1) 1.4 (1) 7 - 1.4 = 5.6 OR 10% = 0.7 (1) 0.7 + 0.7 = 1.4 (1) 7 - 1.4 = 5.6	award full marks for correct numerical answer without working accept other valid methods of calculation	**(3)**

Question number	Answer	Additional Guidance	Mark
6(a)(ii)	An answer that combines points of interpretation / evaluation to provide a logical description: • percentage diagnosed increases with age (1) • percentage diagnosed is higher in males than females (1)	accept other valid trends	**(2)**

Question number	Answer	Mark
6(a)(iii)	An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (3 mark): • diet contains less sugar (1) • so less increase in blood sugar levels (1) • so less production of insulin (1) • by the pancreas (1) • decreasing the chance of insulin resistance developing (1)	**(4)**

Question number	Answer	Mark
6(a)(iv)	**injection** of insulin	**(1)**

Question number	Answer	Mark
6(b)(i)	**C** heart disease	**(1)**

Question number	Answer	Mark
6(b)(ii)	capillaries have thin / weak walls	**(1)**

(Total for question 6 = 12 marks)

Question number	Answer	Additional Guidance	Mark
7(a)(i)	An answer that combines the following points of application of knowledge and understanding to provide a logical description: Two from: • spines / thin leaves / spikes for leaves(1) • swollen stem (1) • reflective cuticle (1) • wide / deep root system (1)	 accept no leaves accept thick waxy cuticle	**(2)**

Question number	Answer	Mark
7(a)(ii)	**B** to allow carbon dioxide to enter and water vapour to leave	**(1)**

Question number	Answer	Additional Guidance	Mark
7(a)(iii)	3.3 ÷ 55 = 0.06 (1) 0.06 x 100 = 6 (%)	award full marks for correct numerical answer without working accept other methods of calculating percentages	**(2)**

Question number	Indicative content	Mark
*7(b)	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material that is indicated as relevant. Additional content included in the response must be scientific and relevant. **AO1 (6 marks)** **shoot** • shoot grows upwards • towards the light • positive phototropism • auxins promote cell elongation • in response to light auxins move away from the light **root** • root grows downwards • in response to gravity • positive gravitropism • auxins accumulate on the lower side • auxins inhibit cell elongation • cells on the top side elongate • root grows towards water	(6)

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–2	• Demonstrates elements of biological understanding, some of which is inaccurate. Understanding of scientific ideas lacks detail. (AO1) • Presents an explanation with some structure and coherence. (AO1)
Level 2	3–4	• Demonstrates elements of biological understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas is not fully detailed and/or developed. (AO1) • Presents an explanation that has a structure which is mostly clear, coherent and logical. (AO1)
Level 3	5–6	• Demonstrates accurate and relevant biological understanding throughout. Understanding of the scientific ideas is detailed and fully developed. (AO1) • Presents an explanation that has a well-developed structure which is clear, coherent and logical. (AO1)

(Total for question 7 = 11 marks)

Question number	Answer	Mark
8(a)(i)	(belt) transect	(1)

Question number	Answer	Mark
8(a)(ii)	An explanation that combines identification via a judgement (1 mark) to reach a conclusion via justification/reasoning (2 marks): • number of poppy plants decreases (closer to the woodland) (1) and • trees block light (1) • light is needed for photosynthesis (1) or • competition (with other species/trees) (1) • for resources/named resource (1)	(3)

Question number	Answer	Mark
8(a)(iii)	An answer that combines the following points to provide a plan: • **randomly** place the quadrat several times (1) • record the number of poppy plants in each quadrat (1) • method for scaling up the area sampled to the total area of the field (1)	(3)

Question number	Answer	Additional guidance	Mark
8(b)	An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark): • woodland provides a different type of habitat (1) • allows different {animal/plant} species to live in the park (1)	accept the idea that human intervention is controlled accept specific example e.g. nesting site for birds	**(2)**

Question number	Answer	Additional guidance	Mark
8(c)	Any two from: • increases the number of caterpillars / squirrels (1) • decreases the number of foxes / hawks (1) • increases number of acorns available / oak tree grows better (1) • increases the number of blackbirds (1)	accept other feeding relationships as shown in the food web	**(2)**

Total for Question 8 = 11 marks

Question number	Answer	Additional guidance	Mark
9(a)	Any two from: • weight (1) • height (1) • fitness (1) • other medical conditions (1) • drug intake / medication (1)	accept other valid factors when selecting the people	**(2)**

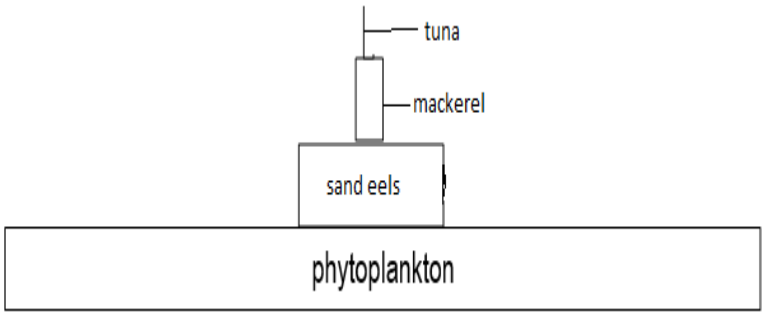
Question number	Answer	Additional guidance	Mark
9(b)	Subtraction 630 - 480 = 150 (1) Evaluation (150 ÷ 630) x 100 = 24 (%)	accept 23.8 award full marks for correct numerical answer without working	**(2)**

Question number	Answer	Additional guidance	Mark
9(c)	An explanation that combines identification – application of knowledge (1 mark) and reasoning / justification – application of understanding (2 marks): • less aerobic respiration (1) • because there is reduced oxygen entering the lungs (1) • which reduces oxygen supplied to the blood/to the cells (1)	accept reduced removal of carbon dioxide from the blood / less energy released (1)	**(3)**

Question number	Indicative content	Mark
***9(d)**	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material that is indicated as relevant. Additional content included in the response must be scientific and relevant. **AO1 (6 marks)** **aerobic respiration** • requires oxygen • releases more energy • produces carbon dioxide and water • no lactic acid produced **anaerobic respiration** • does not require oxygen • releases less energy • produces lactic acid • lactic acid has to be removed afterwards • only occurs when oxygen is limiting	**(6)**

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–2	• Demonstrates elements of biological understanding, some of which is inaccurate. Understanding of scientific ideas lacks detail. (AO1) • Presents an explanation with some structure and coherence. (AO1)
Level 2	3–4	• Demonstrates elements of biological understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas is not fully detailed and/or developed. (AO1) • Presents an explanation that has a structure which is mostly clear, coherent and logical. (AO1)
Level 3	5–6	• Demonstrates accurate and relevant biological understanding throughout. Understanding of the scientific ideas is detailed and fully developed. (AO1) • Presents an explanation that has a well-developed structure which is clear, coherent and logical. (AO1)

(Total for question 9 = 13 marks)

Question Number	Answer	Mark
10(a)	correct shape (exact widths not required) (1) – ignore pyramid drawn as a triangle correct labels (1)  	**(2)**

Question Number	Answer	Mark
10(b)	An explanation that combines identification via a judgement (1 mark) to reach a conclusion via justification/reasoning (3 marks): • high-protein diet (1) • because the tuna reach 35kg in approximately three months (1) • whereas the medium-protein diet the tuna take four and a half months to reach this mass (1) • on the low-protein diet the tuna do not reach 35kg (1)	**(4)**

Question Number	Answer	Additional guidance	Mark
10(c)	conversion 60 ÷ 1000 =0.06 (1) evaluation 300 ÷ 0.06 = 5000 (kg)	accept alternative methods of calculation award full marks for correct numerical answer without working	**(2)**

Question Number	Answer	Additional guidance	Mark
10(d)(i)	An explanation that combines identification - application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark): • to restrict movement (1) • so less energy is lost (1) OR • to prevent predators entering (1) • so fish not harmed / higher yield (1)	accept other relevant explanations	**(2)**

Question Number	Answer	Additional guidance	Mark
10(d)(ii)	increasing world population / humans eating a high protein diet / increase preference for fish protein	accept other relevant reasons	**(1)**

Total for Question 10 = 11 marks