



Mark Scheme (Results)

January 2018

Pearson Edexcel GCSE
In Biology (5BI2F)
Paper 01

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

January 2018

Publications Code 5BI2F_01_1801_MS

All the material in this publication is copyright

© Pearson Education Ltd 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.

Question number	Answer	Acceptable answers	Marks
1 (a) (i)	C root hair cells		(1)

Question number	Answer	Acceptable answers	Marks
1 (a) (ii)	A active transport		(1)

Question number	Answer	Acceptable answers	Marks
1 (b)	<ul style="list-style-type: none"> • water • phloem 	answers must be in correct order accept phonetic spellings	(2)

Question number	Answer	Acceptable answers	Marks
1 (c) (i)	A description including two of the following <ul style="list-style-type: none"> • increases then decreases (1) • reference to correct data from the graph(1) 		(2)

Question number	Answer	Acceptable answers	Marks
1 (c) (ii)	A description including two of the following <ul style="list-style-type: none"> • flat leaf / large surface area • contains chlorophyll / chloroplasts • has stomata 		(2)

Question 1 total= 8 marks

Question number	Answer	Acceptable answers	Marks
2 (a)		<p>Two marks for 3 lines correct. One mark for 1 or 2 lines correct.</p> <p>Reject more than one line from an enzyme</p>	(2)

Question number	Answer	Acceptable answers	Marks
2 (b) (i)	<p>A description including the following:</p> <ul style="list-style-type: none"> organ Y digests more carbohydrate (than organ W) (1) 34g compared to 6g/28g more (1) 		(2)

Question number	Answer	Acceptable answers	Marks
2 (b) (ii)	<p>A explanation including:</p> <ul style="list-style-type: none"> organ Y (1) <p>and any one from the following:</p> <ul style="list-style-type: none"> food spends more time in small intestine (as it is longer) (1) more carbohydrate digested than in any other organ / intestine contains carbohydrase (1) 		(2)

Question number	Answer	Acceptable answers	Marks
2 (b) (iii)	<p>A suggestion including two of the following:</p> <ul style="list-style-type: none"> • organ X is the stomach (1) • contains acid/low pH (1) • carbohydrase/amylase not present/denatured (1) 		(2)

Question 2 total = 8 marks

Question number	Answer	Acceptable answers	Marks
3 (a)	<ul style="list-style-type: none"> • 46 (1) • 4 (1) 	answers must be in the correct order	(2)

Question number	Answer	Acceptable answers	Marks
3 (b)	D two strands coiled to form a double helix		(1)

Question number	Answer	Acceptable answers	Marks
3 (c)	<p>A description including two of the following</p> <ul style="list-style-type: none"> • (Rosalind Franklin) shone X-rays through (crystallised) DNA (1) • {examined / used / took} pictures of {diffraction pattern / X image} (1) • showed DNA was a double helix (1) 		(2)

Question number	Answer	Acceptable answers	Marks
3 (d) (i)	<p>A description including two of the following</p> <ul style="list-style-type: none"> • (the gene is) removed / cut out from DNA / chromosome (1) • using an enzyme (1) 	accept restriction (endonuclease) enzyme / named enzyme	(2)

Question number	Answer	Acceptable answers	Marks
3 (d) (ii)	<p>A explanation linking the following</p> <ul style="list-style-type: none"> • spray crop with herbicide (so weeds die) (1) • (so) less competition / more resources / named resource for the crop (1) 		(2)

Question number	Answer	Acceptable answers	Marks
3 (d) (iii)	<p>{cross fertilisation with other species / idea of super-weeds being produced}/ pests becoming resistant to {pesticide / herbicide} / GM {seeds / plants} cost more</p>	accept other valid concerns	(1)

Question 3 total = 10 marks

Question number	Answer	Acceptable answers	Marks
4 (a) (i)	6:3(1) 2:1	full marks for correct final ratio	(2)

Question number	Answer	Acceptable answers	Marks
4 (a) (ii)	<p>A description including three of the following:</p> <ul style="list-style-type: none"> • named appropriate equipment (1) • use within a set area (1) • repeat over several areas of woodland (1) • count wingless moths /calculate average number of wingless moths (1) • scale up (to area of woodland) (1) 		(3)

Question number	Answer	Acceptable answers	Marks
4 (b) (i)	B diffusion		(1)

Question number	Answer	Acceptable answers	Marks
4 (b) (ii)	<p>A description including two of the following</p> <ul style="list-style-type: none"> • {male and female gametes/sex cells/sperm and egg/ haploid cells} join (1) • DNA/nuclei combine (1) • zygote/diploid cell produced (1) 		(2)

Question number	MT	Answer	Acceptable answers	Marks
4 (b) (iii)	exp	<p>A description including two of the following</p> <ul style="list-style-type: none"> • (stem) cell divides(1) • by mitosis (1) • cells differentiate/become specialised (1) 		(2)

Question 4 total =10 marks

Question number	Answer	Acceptable answers	Marks
5 (a) (i)	<p>An explanation linking the following:</p> <ul style="list-style-type: none"> cell X (1) because it contains a cell wall/chloroplasts/vacuole (1) 		(2)

Question number	Answer	Acceptable answers	Marks
5 (a) (ii)	<p>C glucose + oxygen → water + carbon dioxide</p>		(1)

Question number	Answer	Acceptable answers	Marks
5 (a) (iii)	mitochondria/mitochondrion	accept phonetic spelling	(1)

Question number	Answer	Acceptable answers	Marks
5 (b) (i)	<p>$3 \div 0.02$ (1) (X)150</p>	award full marks for correct bald answer	(2)

Question Number		Indicative Content	Mark
QWC	*5b(ii)	<p>A description which includes some of the following points</p> <p>Prepare microscope slide Place the slide on the stage Select the smallest objective lens Look through the eyepiece Adjust the light source Use focusing wheel to obtain a clear image Move slide to view cells Change objective lens to increase magnification Refocus to obtain clear image</p>	(6)
Level	0	No rewardable content	
1	1 - 2	<ul style="list-style-type: none"> • A limited description that names at least two parts of the microscope or at least one step involved in using a microscope • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy 	
2	3 - 4	<ul style="list-style-type: none"> • A simple description that links at least three steps involved, in a logical order, in using a microscope • 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	<ul style="list-style-type: none"> • A detailed description that links most steps involved in using the microscope, in a logical order, to give a clear, detailed image • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors 	

Question 5 total = 12 marks

Question number	Answer	Acceptable answers	Marks
6 (a) (i)	A line drawn to anywhere to the edge of or the inside the left atrium		(1)

Question number	Answer	Acceptable answers	Marks
6 (a) (ii)	<p>A description including any two of the following</p> <ul style="list-style-type: none"> the heart /ventricle / muscle contracts (1) increasing the pressure of the blood (1) pushing blood out of the ventricle (1) into pulmonary artery (1) 	<p>accept reference to (semilunar) valve (1)</p>	(2)

Question number	Answer	Acceptable answers	Marks
6 (a) (iii)	D the pulmonary vein		(1)

Question number	Answer	Acceptable answers	Marks
6 (b)	<p>20 (1)</p> <p>$\div 38 (x100) = 52.6\% / 53\%$</p>	<p>award full marks for bald correct final answer</p>	(2)

Question Number		Indicative Content	Mark
QWC	*6c	<p>A description which includes some of the following points</p> <p>Red blood cells</p> <ul style="list-style-type: none"> • contain haemoglobin • carry oxygen • as oxyhaemoglobin • from lungs to tissues <p>White blood cells</p> <ul style="list-style-type: none"> • produce antibodies • produce antitoxins • phagocytes • engulf / ingest pathogens • and destroy them <p>Platelets</p> <ul style="list-style-type: none"> • make fibrin / fibres • forms a mesh / clot • reduces / stops blood loss 	(6)
Level	0	No rewardable content	
1	1 - 2	<ul style="list-style-type: none"> • A limited description about at least one blood component • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy 	
2	3 - 4	<ul style="list-style-type: none"> • A simple description about at least two blood components OR detailed information about one blood component • 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	<ul style="list-style-type: none"> • A detailed description including the details about at least two blood components • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors 	

Question 6 total = 11 marks

