



Mark Scheme (Results)

Summer 2014

Pearson Edexcel GCSE in Biology
(5BI2F) Paper 01

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Question Number	Answer	Acceptable answers	Mark
1 (a) (i) 1	oxygen		(1)

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

Question Number	Answer	Acceptable answers	Mark
1 (a) (ii)	<p>A description including any two from the following:</p> <ul style="list-style-type: none"> defend against disease/infection(1) { by engulfing /destroying/digesting} { pathogens/bacteria/ microorganisms/viruses/ foreign particles} (1) produce antibodies(1) produce antitoxins(1) 	<p>Allow fight infection</p> <p>Ignore germs</p>	(2)

Question Number	Answer	Acceptable answers	Mark
1 (b)	<p>A description including any two of the following:</p> <ul style="list-style-type: none"> (overall) decrease (1) (blood pressure) in arteries goes up and down / fluctuates/ shows pulse(1) pulse/fluctuation becomes less (as it flows towards capillaries)(1) 	<p>Allow increases and decreases</p> <p>Ignore references to pressure in veins and capillaries</p>	(2)

Question Number	Answer	Acceptable answers	Mark
1 (c)	<p>An explanation including two of the following:</p> <ul style="list-style-type: none"> • left ventricle has a thicker wall (1) • left ventricle pumps blood to the body/further distance (1) • right ventricle pumps blood to the lungs/shorter distance (1) • idea of different blood pressures (1) 	<p>MAX 1 if there is no reference to left or right side</p> <p>ORA/right side contains less muscle/ left side contains more muscle</p>	(2)

(Total for question 1 = 8 marks)

Question Number	Answer	Acceptable answers	Mark
2(a)	23 (breaths per minute)		(1)

Question Number	Answer	Acceptable answers	Mark
2(b)	<p>One mark for any of the following:</p> <p>(Student Y) exercising harder /faster/carried out a different exercise</p> <p>(Student Y) has a smaller lung capacity/ greater mass/is less fit</p> <p>(Student Y's) breathing rate started higher</p>	<p>Accept: Any reasonable suggestion</p> <p>ORA</p> <p>ORA</p> <p>ORA</p>	(1)

Question Number	Answer	Acceptable answers	Mark
2(c)	<p>An explanation linking :</p> <ul style="list-style-type: none"> • (more) oxygen needed (1) • (aerobic) respiration (1) • (greater) energy demand (1) • to remove (excess) carbon dioxide(1) 	<p>Ignore references to anaerobic respiration</p>	(2)

Question Number	Answer	Acceptable answers	Mark
2(d)	B diffusion		(1)

Question Number	Answer	Acceptable answers	Mark
2(e)	<ul style="list-style-type: none">• not enough oxygen (reaching muscles) (1)• anaerobic respiration(1)		(2)

Question Number	Answer	Acceptable answers	Mark
2(f)	C glucose		(1)

(Total for question 2 = 8 marks)

Question Number	Answer	Acceptable answers	Mark
3(a)(i)	<p>Any two linked statements from the following:</p> <ul style="list-style-type: none"> • focusing wheel (1) • for sharper/more clear image (1) <p>OR</p> <ul style="list-style-type: none"> • more/better/stronger (objective) lenses (1) • greater magnification(1) <p>OR</p> <ul style="list-style-type: none"> • electric light (1) • brighter/clearer image (1) <p>OR</p> <ul style="list-style-type: none"> • stage/stage clips(1) • holds the slide steady(1) <p>OR</p> <ul style="list-style-type: none"> • light underneath (1) • brighter/clearer image/ light goes through the slide (1) 	Ignore 'more detail' as this is in the question	(2)

Question Number	Answer	Acceptable answers	Mark
3(a)(ii)	B – an electron microscope		(1)

Question Number	Answer	Acceptable answers	Mark
3(a)(iii)	A cell membrane		(1)

Question Number	Answer	Acceptable answers	Mark
3(b)(i)	<ul style="list-style-type: none"> • $30 \div 0.1$ (1) • 300 	Award 2 marks for correct bald answer	(2)

Question Number	Answer	Acceptable answers	Mark
3(b)(ii)	contains genetic information/genes/DNA/ chromosomes /controls the activities of the cell/cell reactions		(1)

Question Number	Answer	Acceptable answers	Mark
3(c)	<p>A description including two of the following points</p> <ul style="list-style-type: none"> • provides support (to plant/cell)/gives cell its shape(1) • stores cell sap (1) • (containing) minerals / sugar / named sugar/amino acids (1) 	<p>Accept reference to turgidity</p> <p>Accept: stores water/nutrients</p>	(2)

(Total for question 3 = 9 marks)

Question Number	Answer	Acceptable answers	Mark
4(a)(i)	<p>A description including two of the following:</p> <ul style="list-style-type: none"> • (sex cells) are haploid (1) • sex cells/gametes fuse(1) • genetic information/DNA/ chromosomes combine/mix (1) • to form a diploid cell (1) 	<p>Accept reference to cells containing half the number of chromosomes Accept: male sex/sperm cell joins with female sex cell/egg cell</p> <p>Accept reference to a cell containing the full number of chromosomes</p>	(2)

Question Number	Answer	Acceptable answers	Mark
4(a)(ii)	(cell) differentiation	Allow: specialisation	(1)

Question Number	Answer	Acceptable answers	Mark
4(a)(iii)	D proteins		(1)

Question Number	Answer	Acceptable answers	Mark
4(b)(i)	180 (mg)		(1)

Question Number	Answer	Acceptable answers	Mark
4(b)(ii)	<p>A description including:</p> <ul style="list-style-type: none"> • (mass) increases (1) • manipulation of data/correct reference to specific point(s) from the graph e.g. mass increases most rapidly between 80 and 120 days(1) 	Ignore growth	(2)

Question Number	Answer	Acceptable answers	Mark
4(c)	<p>A description including two of the following:</p> <ul style="list-style-type: none"> • mitosis (1) • DNA/chromosomes are copied (1) • 2 cells (produced)(1) • (daughter) cells are genetically identical (1) • cells are diploid(1) 	<p>Credit reference to other stages of mitosis</p> <p>Accept clones</p>	(2)

Question Number	Answer	Acceptable answers	Mark
4(d)	<p>A suggestion including two of the following:</p> <ul style="list-style-type: none"> • to produce poisons/chemicals/pesticides (1) • to resist herbicides (1) • to contain more nutrients (1) • faster growing (1) • more tolerant to harsh conditions e.g. drought (1) • increased yield (1) 	<p>Accept to reduce deficiency disease</p> <p>Accept other reasonable suggestion e.g. increased shelf-life</p>	(2)

(Total for question 4 = 11 marks)

Question Number	Answer	Acceptable answers	Mark
5(a)(i)	<p>An explanation including two of the following:</p> <ul style="list-style-type: none"> • (into) root hair cells(1) • by active transport(1) • using energy(1) • against a concentration gradient/(from a low concentration in the soil) to a high concentration (in the plant cell)(1) 	<p>Ignore diffusion Allow pumped in</p>	(2)

Question Number	Answer	Acceptable answers	Mark
5(a)(ii)	D xylem vessels		(1)

Question Number	Indicative Content	Mark
QWC	<p>*5(b)</p> <p>A explanation to include some of the following points</p> <p>Structure/feature:</p> <ul style="list-style-type: none"> • large surface area • contains stomata/pores • controlled by guard cells • contains air spaces • chloroplasts <p>Processes:</p> <ul style="list-style-type: none"> • carbon dioxide in/out • oxygen in/out • water (vapour) in/out • diffusion (of gases) • from a high to low concentration (of gas) • reference to photosynthesis/respiration/ environmental factors /transpiration • concentration gradient of carbon dioxide maintained (by chloroplasts) 	(6)
Level	0	No rewardable content
1	1 - 2	<ul style="list-style-type: none"> • a limited explanation that mentions one structure OR one named gas OR one process e.g. carbon dioxide moves into the leaf or the leaf has stomata • 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 explanation that links a structure to a named gas e.g. carbon dioxide enters through the stomata OR a structure to a named process e.g. gases diffuse through air spaces • 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 explanation that links BOTH CO₂ and O₂ to stomata. At least one other structure and/or process linked to gas exchange will be included. • the answer communicates ideas clearly and coherently using a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors

Question Number	Answer	Acceptable answers	Mark
5(c)(i)	14 (cm ³)		(1)

Question Number	Answer	Acceptable answers	Mark
5(c)(ii)	<p>A description that linking either:</p> <ul style="list-style-type: none"> • temperature / CO₂ concentration/water (1) • correct reference to named factor being increased (1) 	<p>Ignore light/sunlight</p> <p>Accept a method describing how named factor could be increased</p>	(2)

(Total for question 5 = 12 marks)

Question Number	Answer	Acceptable answers	Mark
6(a)(i)	<p>The diagram shows a grey enzyme with a specific notch on its left side. To its right, four different chains of geometric shapes (triangles, squares, circles, and pentagons) are shown, each preceded by a bullet point. These are labeled 'substrates'. A line points from the enzyme's notch to the second substrate, which is partially broken down, illustrating the lock-and-key model of enzyme action.</p>	Reject if more than one line drawn from enzyme	(1)

Question Number	Answer	Acceptable answers	Mark
6(a)(ii)	C lock and key		(1)

Question Number	Answer	Acceptable answers	Mark
6(b)(i)	<p>A explanation including two of the following:</p> <ul style="list-style-type: none"> • (baby food) contains proteins (1); • (protease) breaks down/digests proteins(1); • into amino acids (1); • amino acids can then be absorbed(1); • reference to growth(1); 	<p>Accept large/ insoluble molecules</p> <p>Accept small/ soluble molecules</p>	(2)

Question Number	Answer	Acceptable answers	Mark
6(b)(ii)	An explanation including two of the following: <ul style="list-style-type: none">• less/no activity/not at optimum(1);• enzyme/active site changes shape(1);• cannot bind to substrate(1);• denatures(1);	Accept destroyed	(2)

Question Number		Indicative Content	Mark
QWC	* 6(c)	<p>A description that links some of the following points</p> <ul style="list-style-type: none"> • carbohydrase breaks down carbohydrates • to maltose/glucose/sugar • carbohydrase in small intestine/ mouth • reference to amylase • lipase breaks down fats • to fatty acids/glycerol • in the (small) intestine 	(6)
Level	0	No rewardable content	
1	1 - 2	<ul style="list-style-type: none"> • a limited description that gives one correct link between an enzyme and its substrate OR product OR location e.g. carbohydrases in the mouth • 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 gives one correct link between one enzyme, its substrate, product and its location e.g. carbohydrases break down carbohydrates to glucose in the small intestine OR two enzymes with their substrates and either the products OR location • 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 BOTH enzymes with their substrates AND their products AND their location. • the answer communicates ideas clearly and coherently using a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors 	

(Total for question 6 = 12 marks)

