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Mark Scheme (Results)

March 2013

GCSE Biology
5BI2F/01

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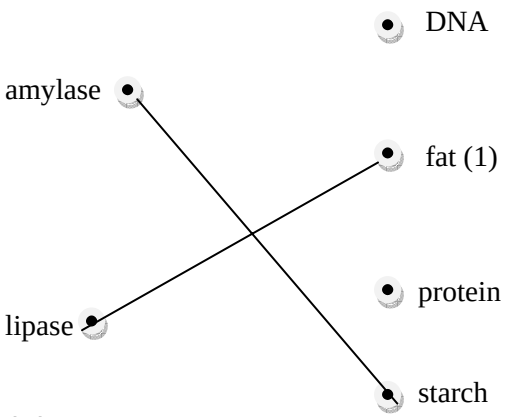
Question Number	Answer	Acceptable answers	Mark
1(a)	**enzyme** **molecule that the enzyme digests**  (1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
1(b)(i)	**A** amino acids		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(b)(ii)	**B** pepsin has an optimum pH of 3		**(1)**

Question Number	Answer	Acceptable answers	Mark
1 (b)(iii)	A description including two from the following points • pepsin has a lower activity • pepsin works at a lower pH • pepsin works within a narrower pH range • the optimum pH of pepsin is lower	ORA Accept: pepsin works in acidic conditions	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(b)(iv)	A explanation linking the following points • it is less active/activity only 6 arbitrary units (1) • (starting to) denature (1) • active site is changing shape (1) • cannot bind to its substrate as well at this pH (1)	Accept: reference to pH9 being the optimum/pH11 is not the optimum	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(a)(i)	**B** - oligosaccharides		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(b)(i)	• 15000 - 8000 (1) • 7000 (1)	Accept: ecf - a sum that includes any value from 14200 to 15000 as alternative to 15000 minus 8000 and its correct answer e.g. 14200 – 8000 = 6200 (1 maximum) 2 marks for correct bald answer	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(b)(ii)	A description that includes: increases number of useful bacteria	Ignore numbers	**(1)**

Question Number	Answer	Acceptable answers	Mark
2(c)(i)	objective lens / eye piece lens	lens	**(1)**

Question Number	Answer	Acceptable answers	Mark
2(c)(ii)	A description including two of the following: • Image has more clarity/is more clear(1) • More detail can be seen(1) • Larger image can be seen(1)	Accept: more focussed Accept: named bacterial cell components Accept: idea of greater magnification	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(c)(iii)	Any one of the following: • cell wall • flagellum	Accept: cell membrane Ignore: tail	**(1)**

Question Number	Answer	Acceptable answers	Mark
3(a)(i)	mitosis (1)	Do not accept meiosis or any word that sounds similar	**(1)**

Question Number	Answer	Acceptable answers	Mark
3(a)(ii)	**B** - getting longer		**(1)**

Question Number	Answer	Acceptable answers	Mark
3(a)(iii)	An description linking the following points • idea that cells are becoming specialised (1) • to perform a specific function / eq (1) • eg phloem, xylem, root hair cell (1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
3(b)(i)	• total = 30.3 (1) • mean = 10.1 (1)	2 marks for correct bald answer Accept: incorrect values in sum ÷ 3 = correct answer e.g. (20.4 + 14.6 + 10.6) ÷ 3 = 15.2 (1 mark max)	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(b)(ii)	A suggestion including two from the following points • fertilisers increase plant height/growth (1) • A has a greater effect than B/ A has a greater effect than C/ B has a greater effect than C (1) • A has the greatest effect/C has the least effect (1)	Accept: Fertiliser A/B/C increases height/growth (1) ORA Accept: reference to compared figures/correct manipulation of figures (1)	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(b)(iii)	Any two from the following points • shoot/stem diameter (1) • number of branches (1) • number of leaves/flowers (1) • length/surface area of leaves (1) • length of roots (1) • size of fruit (1) • number/yield of fruit (1)	Accept: size of leaves Accept: mass/dry mass/weight of plant/fruit (1)	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(a)(i)	A description that includes two of the following points • gametes produced (1) • haploid cells / half the number of chromosomes (1) • genetically different (1)	Accept: sex cells are produced Accept: 23 chromosomes	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(a)(ii)	A description that includes two of the following points • idea that sperm and egg cell/gametes join (1) • genetic information combines (1) • zygote produced (1)	Accept sex cells join Accept: chromosomes/DNA combines Accept: diploid cell	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(b)	Suggestions that include **one** advantage from • differentiate into any (body) cell • grow/repair tissues/ body organ / limb • for transplants and one disadvantage from • embryos are destroyed • can become cancerous • justified ethical issue e.g some people feel that embryo has a right to life	Accept: research cures/treatments for disease/named genetic disease/Parkinsons/cancer/diabetes	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(c)(i)	A description that includes three of the following points • two strands (1) • double helix (1) • reference to bases (1) • A with T / G with C (1) • hydrogen bonds (1)	 Accept: description e.g twisted ladder Accept: complimentary pairs	 **(3)**

Question Number	Answer	Acceptable answers	Mark
(4)(c)(ii)	**C** protein		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(a)(i)	**B** 80 cm^3		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(a)(ii)	A description that includes **two** of the following: • it increases from rest to low intensity (1) • low to moderate intensity stays the same (1) • increases from moderate (1) • reference to compared figures/correct manipulation of figures (1)	Accept: increases as exercise intensity increases (1)	**(2)**

Question Number	Answer	Acceptable answers	Mark
5(a)(iii)	A explanation that includes **three** of the following • (more) oxygen needed (1) • (more) glucose needed (1) • for (aerobic) respiration (1) • which releases (more) energy (1) • so that muscles can work for longer/harder (1)	Accept: reduce muscle fatigue/cramp Accept: to reduce build up of lactic acid (1) remove carbon dioxide/waste from cells (1) maintain body temperature (1)	**(3)**

Question Number		Indicative Content	Mark
QWC	***5(b)**	An explanation including some of the following points in a logical sequence • two sides to prevent mixing of blood • left side deals with oxygenated blood • thicker wall of left ventricles • pump blood to body • right side deals with deoxygenated blood • pumps blood to lungs • muscular wall of ventricles which contract • atria receive blood • valves to prevent backflow • correct reference to (named) arteries/veins	**(6) exp**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited explanation that links one structure to its function e.g. the right side pumps blood (to the lungs) OR the pulmonary vein takes blood into the heart. • 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 that links two different structures in the heart to their function e.g. right ventricle pumps blood to the lungs AND atria receive blood • 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 that covers most of the indicative content and that includes at least three different structures linked to their function • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

Question Number	Answer	Acceptable answers	Mark
6(a)(i)	**B**		**(1)**

Question Number	Answer	Acceptable answers	Mark
6(a)(ii)	A explanation that includes any two of the following points • contains chloroplasts (1) • containing chlorophyll (1) • which absorb light energy (1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
6(b)(i)	• Any value between 24 ^{o}C to 28^{o}C	units (^{o}C) must be given	**(1)**

Question Number	Answer	Acceptable answers	Mark
6(b)(ii)	A description that includes two of the following: • named limiting factor e.g water, carbon dioxide, light (1) • described effect on rate of photosynthesis e.g (lower light intensity) lower rate of photosynthesis (1)	ORA	**(2)**

Question Number		Indicative Content	Mark
QWC	***6(c)**	A description including some of the following points in a logical sequence • (water moves into) root hair cells • by osmosis • from a high concentration (of water) • to a low concentration (of water) • down a concentration gradient • through a partially permeable membrane • through xylem vessels • by capillary action • (into leaves) and out through the stomata • reference to transpiration/transpiration stream	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited description of how water enters the plant **OR** how water moves through the plant e.g. waters goes into the roots from the soil **OR** water goes up the stem • 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 that includes a reference to root hair cells **OR** xylem vessels OR osmosis in the correct context. • 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 that includes a reference to root hair cells **AND** xylem vessels **AND** osmosis in the correct context. • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

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