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Mark Scheme (Results)

Summer 2012

GCSE Biology
5BI2H/01

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GCSE Biology 5BI2H/01 Mark Scheme – Summer 2012

Question Number	Answer	Acceptable answers	Mark
1(a)(i)	diffusion / osmosis		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(a)(ii)	active transport	active transportation	**(1)**

Question Number	Answer	Acceptable answers	Mark
1(a)(iii)	xylem	xylem vessel / tube(s)	**(1)**

Question Number	Answer	Acceptable answers	Mark
1(b)(i)	reasonable straight line drawn through all points, must be drawn with a ruler, must have at least one point on either side of the line	lines drawn to include zero value are not correct reject two lines drawn reject point to point lines ignore extrapolation to y axis	**(1)**

Question Number	Answer	Acceptable answers	Mark
1(b)(ii)	reading from their graph at the point that line crosses x axis / 0.3M +/- half square tolerance	ecf from 1(b)(i)	**(1)**

Question Number	Answer	Acceptable answers	Mark
1(b)(iii)	An explanation linking the following points in a logical order: • ref to (increase in mass due to) {osmosis / movement of water / absorption of water} (1) • water into the cell (1) • ref to higher concentration of water outside of the courgette (1) • water across (cell) membrane / cell wall (1)	**Ignore** movement of sugar correct ref to sugar concentration ORA	**(3)**

Question Number	Answer	Acceptable answers	Mark
2 (a)(i)	mitosis	any reasonable phonetic spelling provided there is a 't' ignore asexual reproduction	**(1)**

Question Number	Answer	Acceptable answers	Mark
2 (a)(ii)	Any two from the following: • same characteristics in offspring as parent plant /best characteristics inherited / clones produced / identical (1) • easier to generate new plants/propagate (1) • quicker to produce new plants (1) • cheap /idea that the plants will not run out / no need to buy new plants / seeds (1)	Accept same as parent plant	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(b)	<u>Stage 1</u> • to break open cells/release cell contents / release DNA /dissolve proteins (1) <u>Stage 3</u> • to precipitate DNA from the solution/to separate DNA (from other components)/ (1)	Accept break down cell membrane / cell wall Accept to make DNA visible ignore refs to freezing the DNA	**(2)**

Question Number	Answer	Acceptable answers	Mark
2 (c)(i)	**C** 4		**(1)**

Question Number	Answer	Acceptable answers	Mark
2 (c)(ii)	• location drawn anywhere in cytoplasm (1) • correct name - nucleus (1)	chloroplast / mitochondria NB these are stand alone mark points	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(a)	a group of (different) tissues	(different) types of tissue (working together)	**(1)**

Question Number	Answer	Acceptable answers	Mark
3(b)(i)	**C** 2		**(1)**

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

Question Number	Answer	Acceptable answers	Mark
3(c)	An explanation linking **four** of the following points • microvilli (1) • large surface (area) (1) • single layer of cells / thin walls / small diffusion distance (1) • capillary network / good blood supply / capillaries within villus (1) • maintains diffusion gradient (1) • increased / fast / maximises diffusion / absorption (1)	Accept - easier / efficient	**(4)**

Question Number	Answer	Acceptable answers	Mark
3(d)(i)	• 86 (%) / 0.86 (1) • correct answer = 4.3 million / 4 300 000 (1)	ecf Accept bald correct answer for 2 marks	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(d)(ii)	Any **one** from • chocolate is thicker / solid / chocolate digested slower (1) • idea of different type of (probiotic) bacteria (1) • more bacteria in the chocolate (initially) (1) • more sugar/ nutrients in the chocolate (1)	ORA	**(1)**

Question Number	Answer	Acceptable answers	Mark
4(a)	• evaluation (1) 30.4 ÷ 182 • Correct answer (1) 0.167 / 0.17 / 0.2 (dm^3)	give full marks for bald correct answer, no working ecf allow correct answer with full number of decimal points 0.1670329	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(b)	An explanation linking three of the following points: • muscles working harder / contract faster (1) • need more energy (1) • (aerobic) respiration (1) • more / enough / faster delivery oxygen (1) • more / enough / faster glucose (to muscles / body) (1) • more / faster removal of carbon dioxide (1)	Ignore references to anaerobic respiration	**(3)**

Question Number	Answer	Acceptable answers	Mark
4(c)	A description including two of the following points: • arteries / aorta transport blood away from heart (1) • veins / vena cava transport blood to the heart (1) • capillaries exchange / pass materials / named substance with tissues / cells (1) • substances carried in plasma / oxygen carried in red blood cells (1) • credit correct description of passage of blood through heart (1)	Ignore references to heart beating faster	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(d)	Any two from the following: • less blood / not enough leaving heart / going round body (1) • less oxygen (to the body) (1) • fatigue/breathlessness/ faint / cannot run as fast (1) • cramps / lactic acid build up / anaerobic respiration (1)	Ignore references to heart beating faster / heart attacks and death Accept less oxygenated blood Accept tired / less energy	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(e)	**C** lactic acid		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(a)(i)	A description including **three** the following points: • (cloned animals) tend to be larger at birth / body organs /named organ enlarged (1) • embryo rejected/fails to develop normally/many cloned mammals failed to develop (1) • (cloned animals) early death /speeds up aging (1) • narrowing of the gene pool / less (genetic) variation (1) • genetic disorders / defects (1) • susceptible to same diseases / pathogen (1)	Ignore answers related to the meat/food product /ethics	**(3)**

Question Number		Indicative Content	Mark
QWC	***5 (a) (ii)**	A description including • use of body cell • nucleus removed from body / parent cell • use of egg cell • nucleus removed from egg cell/enucleated egg • nucleus (from body cell) transferred to enucleated egg • electric shock; • to stimulate cell division • mitosis • formation of embryo; • embryo implanted • into surrogate	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• Limited description of 2 of the stages involved in cloning and the sequence of events is confused • 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 3 or more of the stages involved in cloning but some of the steps may be missing or out of sequence • 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 5 or more of the stages involved in cloning but the sequence is largely in order and complete • 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
5(b)(i)	**C** haploid gametes combine to produce a diploid zygote		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(b)(ii)	A description including **two** of the following • transcription (1) • DNA unzips (1) • (formation of) mRNA (1) • complementary to / copy of DNA / DNA acts as a template (1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
6(a)	**A** differentiate into any type of cell		**(1)**

Question Number	Answer	Acceptable answers	Mark
6(b)	Any **two** structures from the list with at least **one** matched adaptation: Structures (maximum of 2) • biconcave shape (1) • no nucleus (1) • thin membrane (1) • flexible / small (1) • contains haemoglobin (1) (matched) adaptation (maximum of 2) • large surface area / increase oxygen uptake (1) • to increase amount of haemoglobin / oxygen-carrying capacity (1) • so short distance for diffusion (1) • to get through capillaries (1) • to bind oxygen (1)		**(3)**

Question Number	Answer	Acceptable answers	Mark
6(c)	A description including **two** of the following points • clotting / to seal a wound / scab formed (1) • stop bleeding (1) • prevent infection / entry of microbes (1) • fibrin (1)		**(2)**

Question Number		Indicative Content	Mark
QWC	***6d**	A comparison between mitosis and meiosis including **Mitosis** • (genetically) identical cells produced • two daughter cells • one division • diploid daughter cells • identical set of chromosomes • occurs in the formation of body cells • for growth and repair (of body tissues) **Meiosis** • (genetically) non-identical cells • four daughter cells • 2 divisions • haploid daughter cells • half the number of chromosomes • occurs in the formation of gametes • for sexual reproduction • results in genetic variation	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited description including two points on either meiosis or mitosis there maybe confusion between the two but this does not negate the level • 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 including one comparison of meiosis and mitosis or a detailed description of either mitosis or meiosis • 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 comparison of both meiosis and mitosis – at least two correct comparisons made • 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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