

01. 0610_s18_MS_41 Q: 5

	Answer	Mark	Partial Marks
5(a)	$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$ (+ energy released) ;;	2	one mark for correct symbols one mark for correct balancing
(b)	150(%) ;;	2	one mark for correct working if answer wrong
(c)	demand for, energy / oxygen, increases ; (rate of) respiration increases ; limited supply of oxygen to <u>muscle</u> (tissue) ; <i>idea that</i> heart / pulse / breathing, rate not increased enough ; muscles respire <u>anaerobically</u> ; lactic acid is produced ;	3	
(d)	horses continue to breathe, at high rate / deeper ; continue with a high, heart / pulse, rate ; to provide, enough / AW, oxygen (to 'pay-off' the debt) ; lactic acid, moves / diffuses / AW, (from muscle) into blood ; lactic acid transported to the liver ; (in the liver) lactic acid is, broken down / oxidised / respired (aerobically) ;	4	

02. 0610_s18_MS_42 Q: 5

	Answer	Mark	Partial Marks
(a)	three pairs of legs ; three (named) body segments ; wings ; (pair of) antennae ; <u>compound</u> eyes ;	3	
(b)	$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$ (+ energy released) ;;	2	one mark for correct symbols one mark for correct balancing
(c)(i)	volume ; distance / length ; control / maintain / regulate / stabilise / keep / constant / sustain ;	3	
(c)(ii)	carbon dioxide will affect, results / volume of gas (in respirometer) / carbon dioxide could kill the larvae ;	1	A to measure (changes in) oxygen only
(c)(iii)	growth / development ; active transport ; protein synthesis ; cell division / mitosis ; passage of nerve impulses ; muscle contraction ; AVP ; e.g. metabolism / (description of) metamorphosis	2	A movement / breathe / egestion / digestion / excretion
(d)	<i>prediction</i> as temperature increases the respiration rate will increase ; ora and then decrease ; <i>explanation:</i> there will be an <u>optimum</u> temperature (at a particular temperature) for seed germination ; <i>ref to</i> (respiratory / germination) <u>enzymes</u> ; at high temperatures enzymes denature / described ; at low temperatures not enough (kinetic) energy for, effective collisions / biochemical reactions / respiration / digestion ; ora AVP ;	4	max 3 for explanation e.g. temperature will also affect the gas pressure in the respirometer

03. 0610_s18_MS_43 Q: 5

	Answer	Mark	Partial Marks
(a)	$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$ (+ energy released) ;;	2	one mark for correct symbols one mark for correct balancing
(b)	0.42 (ppm s ⁻¹) ;	1	
(c)	to allow oxygen to enter the chamber ; keep the crickets respiring <u>aerobically</u> ; to remove carbon dioxide ; to prevent death of crickets ; <i>ref. to ethical treatment of animals ;</i> maintaining similar conditions / resetting, for repeat readings / AW ;	2	
(d)	heat (energy) is released by crickets ; movement / <i>ref. to kinetic energy</i> ; pressure increase ; increased carbon dioxide leading to greenhouse effect ; small closed space ;	2	
(e)	rate of oxygen consumption increases with body mass of crickets (for each temperature) ; any suitable data quote comparing rate at different masses (at same temperature) ; rate of oxygen consumption increases with temperature ; any suitable data quote comparing rate at two temperatures (for the same body mass) ;	4	A respiration for oxygen consumption

04. 0610_s18_MS_42 Q: 1

	Answer	Mark	Partial Marks
(a)(i)	A dentine B cement C incisors D canine(s) E premolars F molars ;;;	3	6 / 5 correct = 3 marks 3 / 4 = 2 marks 1 / 2 = 1 mark
(a)(ii)	<u>mechanical</u> ;	1	
(b)(i)	acid ;	1	A carbon dioxide
(b)(ii)	enamel ; dentine ;	2	
(c)	(named) sugar ;	1	

05. 0610_m17_MS_42 Q: 5

	Answer	Mark	Partial Marks
(a)(i)	$C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$;;	2	
(a)(ii)	liver ;	1	
(b)	correct ref to active site ; enzyme must be complementary shape to, substrate / alcohol ; to make enzyme – substrate complex / to allow substrate to bind to enzyme ; ref to only fits one substrate / specific to one substrate ;	3	A 'lock and key'
(c)(i)	increased <u>kinetic</u> energy ; molecules move faster ; increased frequency of collisions ; increased number of successful collisions ;	3	
(c)(ii)	pH ;	1	
(d)(i)	length of DNA ; that codes for a protein ;	2	
(d)(ii)	mRNA passes through ribosomes ; ribosomes assemble amino acids into proteins ; order of amino acids is determined by the sequence of <u>bases</u> in mRNA ; AVP ;	2	

06. 0610_w17_MS_42 Q: 2

	Answer	Mark	Partial Marks
(a)	prevents contamination / transmission, of (named) pathogen / toxin ; prevents, infection / spreading of disease / illness ; ora	2	
(b)	1 low (concentration) of lactic acid in blood at, rest / the start / before ; 2 lactic acid (concentration) increases, steeply / quickly / AW, during exercise ; 3 reaches a peak / increases and decreases ; 4 decreases steeply, then gradually after exercise ; 5 any use of figures ; <i>explanation</i> 6 oxygen, demand increases / does not reach muscles fast enough / AW ; 7 anaerobic respiration ; 8 provides / releases, energy ; 9 anaerobic respiration produces lactic acid ; 10 lactic acid diffuses from muscles into the blood ; 11 lactic acid is, broken down / respired / oxidised / converted to glucose / AW ; 12 in the liver ; 13 ref. to oxygen debt ;	6	e.g. peak at $13.2 \text{ mmol dm}^{-3}$ at 15 minutes \square 0.2 mmol A produces ATP R produce / makes, energy'
(c)(i)	P $12 (\text{km h}^{-1})$ and Q $10 (\text{km h}^{-1})$;	1	One mark only both must be right
(c)(ii)	idea that trained athlete / P, has a higher level of (aerobic) fitness (than Q) ; difference in, gender / age / height / mass / lung capacity / lung mass / stroke volume / muscle type ; AVP ;	1	A P, is fitter than Q / has trained more than Q e.g. ref to genetics but not different genes
(c)(iii)	1 increase in demand for energy ; 2 increase in (aerobic) respiration ; 3 increase in demand for oxygen ; 4 increase in carbon dioxide (concentration) ; 5 decrease in pH / increase in acid, in the blood ; 6 detected by the, brain / chemoreceptors ; 7 (brain stimulates) an increase in breathing rate / faster breathing ; 8 (brain stimulates) an increase in depth of breathing / AW ; 9 ref to negative feedback in correct context ;	4	A 'needs' more energy e.g. rate of breathing remains high until carbon dioxide concentration returns to, normal / set point