Your Science Online

Cambridge IGCSE Biology 0610 style

RESPIRATION – MARK SCHEME

Maximum mark: 45 (Core: 37). ";" separates marking points. Accept correct alternative wording. Apply error carried forward (ecf) where shown.

Question	Answer	Marks	Guidance
1(a)	chemical reactions in cells that break down nutrient molecules / glucose; using oxygen to release energy;	2	do not allow: "produces energy" / "makes energy"
1(b)	oxygen; carbon dioxide;	2	in this order
1(c)	any three from: muscle contraction; protein synthesis; cell division; active transport; growth; passage of nerve impulses; maintaining a constant body temperature;	3	do not allow: "breathing" or "movement" alone
1(d)	$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$ correct formulae; correct balancing;	2	balancing mark only if all formulae are correct
2(a)	increases during the run, from 1.0 to 11.0 ($mmol/dm^3$); decreases after the run / during rest, back to 1.5 at 30 min;	2	data must be quoted with units or clear reference for full marks
2(b)(i)	lactic acid;	1	
2(b)(ii)	not enough oxygen reaches the muscles; so extra energy is released without oxygen;	2	allow: oxygen demand greater than supply
2(c)	oxygen debt is the extra oxygen needed after exercise; lactic acid is carried in the blood to the liver; (continued) fast heart rate transports lactic acid; lactic acid is broken down / respired aerobically (in the liver) using oxygen (from fast, deep breathing);	4	any four points
2(d)	to transport lactic acid to the liver / to supply oxygen to remove the oxygen debt;	1	
3(a)	carbon dioxide;	1	
3(b)	ethanol / alcohol; carbon dioxide;	2	either order

Original practice questions © Your Science Online (yourscienceonline.com). This is not an official Cambridge paper.

Question	Answer	Marks	Guidance
3(c)	rate increases from 10 °C to 40 °C / up to the optimum; rate decreases above 40 °C, with a correct data quote (e.g. 32 at 40 °C, 14 at 50 °C);	2	
3(d)	enzymes (in yeast) are denatured; so respiration stops / yeast cells die;	2	do not allow: enzymes are killed
3(e)	any two from: mass / volume of yeast; concentration / volume of sugar solution; type of sugar; time for counting; size of delivery tube;	2	
3(f)	bread making / brewing beer / wine making / making biofuel (ethanol);	1	
4(a)	seeds use / take in oxygen (for aerobic respiration); carbon dioxide released is absorbed by soda lime; so (volume and) pressure of gas in the tube decreases;	3	
4(b)	24 / 8; 3 (mm per min);	2	
4(c)	as a control; to show that the movement is caused by the respiring (living) seeds / not by other factors;	2	allow: to check that temperature or pressure changes are not moving the drop
4(d)	temperature affects the rate of respiration / volume of gas;	1	allow: enzyme activity changes with temperature
4(e)	little / no movement (CO_2 released replaces O_2 taken in);	1	
5(a)	oxygen needed: yes, no; products (aerobic): carbon dioxide and water; products (anaerobic in muscles): lactic acid; energy: (much) more for aerobic, (much) less for anaerobic;	4	oxygen row: 1 mark (both cells); products: 1 mark for each column; energy row: 1 mark (both cells)
5(b)	glucose is only partly broken down; energy remains in lactic acid;	2	
5(c)	carbon dioxide;	1	

Original practice questions © Your Science Online (yourscienceonline.com). This is not an official Cambridge paper.