

Question Number	Answer	Mark
1 (a)	<ol style="list-style-type: none"> 1. idea that less {food /eq} required to deliver energy requirement ; 2. (so) more likely to have extra food not respired / {extra/surplus} energy ; 3. which could be laid down in body as fat / eq ; 	(2)

Question Number	Answer	Mark
1 (b)	<p>Any two from:</p> <ol style="list-style-type: none"> 1. ADP 2. Pi / inorganic phosphate 3. pyruvate / pyruvic acid / lactate 4. fatty acids 5. NAD / eq 6. acetyl CoA / eq 7. water ; ; 	(2)

Question Number	Answer	Mark
1 (c)	<ol style="list-style-type: none"> 1. many {alpha / eq} glucose monomers ; 2. joined by glycosidic bonds ; 3. detail of glycosidic bonds e.g. 1-4 ; 4. reference to side branches present / 1-6 glycosidic bonds ; 	(3)

Question Number	Answer	Mark
1 (d)	<ol style="list-style-type: none"> 1. more gonadotropins ; 2. {use / muscle uptake} of (excess) fatty acids ; 3. respired to release (much) energy / increased fat metabolism ; 4. idea of reduced requirement to replenish glycogen stores ; 	(3)

Question Number	Answer	Mark
1 (e)	1. (slow twitch muscles) carry out aerobic respiration / full oxidation / eq ; 2. which produces more ATP (than anaerobic) / eq ; 3. 'energy' not locked up in lactate / eq ; 4. idea that it takes longer for lactate levels to build up ;	(2)

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1 * (f)	QWC – Spelling of technical terms (<i>shown in italics</i>) must be correct and the answer must be organised in a logical sequence) 1. Ca^{2+} leaks out of { cell / <i>cytoplasm</i> / <i>sarcoplasmic reticulum</i> } ; 2. idea of change in Ca^{2+} binding to <i>troponin</i> ; 3. causes displacement of <i>tropomyosin</i> / eq ; 4. idea of change in number of <i>myosin</i> binding sites exposed ; 5. comment on <i>myosin</i> binding to <i>actin</i> ; 6. (loss of Ca^{2+} from cell / cytoplasm) therefore force exerted by muscle is lower than expected OR (more Ca^{2+} in cytoplasm) results in less ATP so less muscle contraction ;	(4)

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1 (g)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Process</th> <th style="width: 50%;">Two nucleic acids involved in the process</th> </tr> </thead> <tbody> <tr> <td>Transcription of the ACE gene</td> <td>DNA & mRNA ;</td> </tr> <tr> <td>Production of ACE at a ribosome</td> <td>Any two from: mRNA, tRNA, rRNA ;</td> </tr> </tbody> </table>	Process	Two nucleic acids involved in the process	Transcription of the ACE gene	DNA & mRNA ;	Production of ACE at a ribosome	Any two from: mRNA, tRNA, rRNA ;	(2)
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1 (h)	<ol style="list-style-type: none"> 1. obtain a sample of cells / extract DNA (from cells) ; 2. reference to named enzyme ; 3. idea of how to increase amount of DNA ; 4. reference to electrophoresis ; 5. details of electrophoresis ; 6. use a {DNA / gene} probe ; 7. with a base sequence complementary to that on the {variant / eq} ; 8. idea of matching with known variant profile ; 	(4)

Question Number	Answer	Mark
1 (i)	B ;	(1)

Question Number	Answer	Mark
1 (j)	<ol style="list-style-type: none"> 1. (higher metabolic rate) means more chemical reactions / eq ; 2. more {energy released / ATP used} / eq ; 3. (which) releases heat / eq ; 4. keeps divers warmer / warm for longer / able to swim without a wetsuit / eq ; 	(3)

Question Number	Answer	Mark
1 (k)	<ol style="list-style-type: none"> 1. carbon dioxide due to {deforestation / land cleaning / burning fossil fuels / correct ref to respiration / eq} ; 2. methane from {rice fields / anaerobic bacterial action / ruminant fermentation / named ruminant} ; 	(2)

Question Number	Answer	Mark
1 (I)	1. $1.4 \div 37 =$; 2. 3.8 (%) ; Correct answer gains both 2 marks	(2)

Question Number	Answer	Mark
2(a)(i)	<ol style="list-style-type: none"> 1. idea that a monosaccharide consists of one {sugar / named sugar / eq} (unit) whereas a disaccharide consists of two (sugar units) ; 2. idea that disaccharide has a glycosidic bond (whereas monosaccharide does not) ; 3. general formula for a monosaccharide is $C_nH_{2n}O_n$ whereas formula for disaccharide is $C_nH_{2n-2}O_{n-1}$ / eq ; 	(2)

Question Number	Answer	Mark
2(a)(ii)	<ol style="list-style-type: none"> 1. amylose is {straight chained / unbranched / eq} whereas amylopectin is branched ; 2. amylose {coiled / eq} (whereas amylopectin is not) / eq ; 3. amylose has 1-4 (glycosidic) bonds whereas amylopectin has 1-4 and 1-6 (glycosidic) bonds ; 	(2)

Question Number	Answer	Mark
2(b)	<ol style="list-style-type: none"> 1. idea of carbohydrates providing a source of energy ; 2. if the {energy / carbohydrate / eq} input is greater than the {energy output / carbohydrate use / eq} (weight will be gained) / eq ; 3. idea of excess carbohydrate converted to fat ; 	(2)

Question Number	Answer	Mark
3 (a)	<p>Any 3 of the following:</p> <ol style="list-style-type: none"> 1. consists of (α) glucose ; 2. (joined by 1,4 / 1,6) glycosidic bonds ; 3. branched structure / eq ; 4. idea of compact structure ; <p>Any 3 of the following:</p> <ol style="list-style-type: none"> 5. idea that it is {easily / rapidly / eq} hydrolysed ; 6. (leading to) more {glucose / eq} in a smaller space (in a cell)/ eq ; 7. idea of low solubility ; 8. it does not diffuse out of cells /eq ; 9. it has no osmotic effect / eq ; 	(4)

Question Number	Answer	Mark
3 (b) (i)	<ol style="list-style-type: none"> 1. increasing intensity {increases carbohydrate use / decreases fat use / eq} / eq ; 2. {low intensity exercise / intensity below {39 / 40} au} uses more energy derived from fats / eq ; <p>OR {high intensity exercise / intensity above {39 / 40} au} uses more energy derived from carbohydrates / eq ;</p> <ol style="list-style-type: none"> 3. at {39 / 40} au both sources of energy used equally / eq ; 4. credit correct manipulation of figures to compare energy usage ; 	(3)

Question Number	Answer	Mark
3(b)(ii)	<ol style="list-style-type: none"> 1. idea that this diet is suitable for {a high intensity / eq} event ; 2. credit suitable example of athletic event e.g. any endurance or power event ; 3. reference to more carbohydrate being used (than fat) above {39 / 40} a.u. / eq ; 4. reference to carbohydrate being stored as glycogen ; 5. idea of {maximum / more / lots of} glycogen (stored) ; 6. idea that breakdown of glycogen provides energy (for the event) ; 	(3)