Question Number	Answer	Mark
1(a)	1. polysaccharide ; 2. unbranched / straight chain ; 3. {beta / β} glucose ; 4. (1-4) glycosidic bonds (between glucose molecules) ; 5. reference to intermolecular hydrogen bonds / eq ;	**max (3)**

Question Number	Answer	Mark
1(b)	xylem / sclerenchyma ;	**(1)**

Question Number	Answer	Mark
1(c)	1. reference to {decomposition / decay / putrefaction } (by microorganisms) ; 2. reference to respiration ; 3. releases carbon dioxide for photosynthesis / eq ; 4. methane released in anaerobic (conditions); 5. (methane) available as fuel / eq ;	**max (3)**

Question Number	Answer	Mark
1(d)(i)	Any **one** from: 1. reference to {<u>increased / eq</u>} income / 2. in order to export fuel / 3. reference to more {jobs / eq} / 4. reduce imports of (fossil / bio) fuels / 5. reference to biofuels {renewable / sustainable} / 6. fossil fuels finite / eq / 7. {reduce use of / as alternative to} {fossil fuels / named e.g.} /reference to meeting carbon targets / eq / 8. reference to no loss of {farmland / eq} ;	**max (1)**

Question Number	Answer	Mark
***1(d)(ii) QWC**	(QWC – Spelling of technical terms must be correct and the answer must be organised in a logical sequence) 1. reference to (combustion of) biofuels releases carbon dioxide {recently / eq} removed from atmosphere / eq ; 2. (therefore) there is no (net) increase in carbon dioxide (in atmosphere) / eq ; 3. carbon dioxide is a greenhouse gas / eq ; 4. that {absorbs / traps / eq} {infra-red / heat / long-wave} (radiation reflected from Earth's surface) ; 5. reference to prevents {infra-red / heat / long-wave} {escaping / eq} into space ; 6. reference to (therefore) mean temperature of Earth's surface increases ; 7. idea that carbon in peat(land) was {trapped / eq} {a long time ago / eq} ; 8. idea of peatland clearance releases carbon dioxide ; 9. idea that there is a (net) gain of carbon dioxide (in the atmosphere) ; 10. idea that removal of plants (during clearance) reduces photosynthesis ; 11. reference to carbon dioxide released from (clearance) machinery ;	**max (5)**

Question Number	Answer	Mark
2(a)	A ;	**(1)**

Question Number	Answer	Mark
2(b)	C ;	**(1)**

Question Number	Answer	Mark
2(c)	C ;	**(1)**

Question Number	Answer	Mark
2(d)	D ;	**(1)**

Question Number	Answer	Mark
2(e)	D ;	**(1)**

Question Number	Answer	Mark
2(f)	C ;	**(1)**

Question Number	Answer	Mark
2(g)	A ;	**(1)**

Question Number	Answer	Mark
3 (a)(i)	{α/ alpha} glucose ;	**(1)**

Question Number	Answer	Mark
***3(a)(ii)QW**	(QWC – Spelling of technical terms must be correct and the answer must be organised in a logical sequence) 1. made up of {<u>many / eq</u>} glucose (monomers) ; 2. reference to {energy / eq } storage / glucose is the respiratory substrate / synthesis of organic molecules / eq ; 3. idea that it is {large / eq} ; 4. so is un-reactive / insoluble /no osmotic effect ; 5. molecule coiling / compact / reference to amylose /eq ; 6. more can be stored (in available space) / eq ; 7. reference to branches / reference to (glycosidic) 1-6 bonds / amylopectin ; 8. {rapid / increased / eq } mobilisation of glucose units / eq ;	**max (4)**

Question Number	Answer	Mark
3 (b)(i)	**Allow converse** 1. increase in temperature {decreases / eq } (the mean percentage of amylose present)/ negative correlation ; 2. but by differing percentages in all 3 varieties / C, then A & then B ; 3. credit correct manipulation of the data for 1 variety (e.g. by 4.0 % in variety A / 1.5% in variety B / 5% in variety C) eq ;	**max (2)**

Question Number	Answer	Mark
3 (b)(ii)	1. (variety) B ; 2. idea of smallest difference between (means / amylose content) in B for the two different temp regimes ; 3. idea of {biggest error bars / widest spread} ; 4. idea that error bars for the 2 different temp regimes overlap ; 5. explanation of overlap e.g. some of the data for the lower temp falls within that of the higher temp ;	**max (3)**

Question Number	Answer	Mark
4(a)(i)	1. hydrogen ; 2. glycosidic ;	**(2)**

Question Number	Answer	Mark
4(a)(ii)	sclerenchyma (fibres) ; xylem (vessels) ; cellulose (fibre) ;	**maximum (2)**

Question Number	Answer	Mark
4(b)	1. ref to {microorganisms / microbes / bacteria / fungi / eq} ; 2. ref to respiration of (microorganisms / bacteria / fungi / eq) ; 3. ref to aerobic / anaerobic (respiration) ; 4. converts {organic compounds / eq} to carbon dioxide / eq ; 5. converts {nitrogen compounds / proteins / amino acids/ urea} to ammonia / eq ;	**maximum (4)**

Question Number	Answer	Mark
4(c)	1. correct ref to temperature effect ; 2. correct ref to water availability ; 3. correct ref to waterlogging reduces oxygen availability ; 4. correct ref to frozen water ; 5. ref to more {insects / decomposers / eq} in summer ; 6. correct ref to rate of growth of {microorganisms / eq} ; 7. ref to rate of {metabolism / enzyme reactions} ; 8. use of manipulated figures to support above points e.g. {50 / 60} days faster in late summer ;	**maximum (3)**