Question Number	Answer	Additional Guidance	Mark
1(a)(i)	**B** (are R and S) ;		**(1)**

Question Number	Answer	Additional Guidance	Mark
1(a)(ii)	**C** (is P only) ;		**(1)**

Question Number	Answer	Additional Guidance	Mark
1(b)	1. glycerol plus three fatty acids as reactants ; 2. ester bond labelled ; 3. water shown ;	**2 ACCEPT** an ester bond drawn out correctly even if not labelled	**(3)**

Question Number	Answer	Additional Guidance	Mark
1(c)(i)	condensation / polymerisation ;	**ACCEPT** polymerization	**(1)**

Question Number	Answer	Additional Guidance	Mark
1(c)(ii)	glycosidic / 1,4 glycosidic ;	**ACCEPT** glycoside **ACCEPT** missing commas and commas replaced with dashes **NOT** 1,6 glycosidic **IGNORE** link or bond	**(1)**

Question Number	Answer	Additional Guidance	Mark
1(c)(iii)	Amylose is {coiled / unbranched / eq } / amylose has only 1,4 (glycosidic) bonds / eq ;	**ACCEPT** glycogen is not coiled / branched / has 1,4 and 1,6 glycosidic bonds	**(1)**

Question Number	Answer	Additional Guidance	Mark
1(c)(iv)	1. contain glucose / eq ; 2. idea that they are compact so large {numbers of glucose / amylose / glycogen } molecules can fit into a small volume ; 3. insoluble therefore {does not affect osmosis / eq } ; 4. large molecules therefore { remains in cells / too big to diffuse / eq} ;	**ACCEPT if each described separately but allow each Mp once only** 1. **ACCEPT** can be hydrolysed / broken down to release glucose 2. **ACCEPT** large amounts of energy in a small volume 3. **IGNORE** insoluble so will not dissolve	**(2)**

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

Question Number	Answer	Mark
2(a)(ii)	D a peptide bond ;	**(1)**

Question Number	Answer	Mark
2(a)(iii)	D glucose ;	**(1)**

Question Number	Answer	Mark
2(a)(iv)	C glycerol ;	**(1)**

Question Number	Answer	Additional Guidance	Mark
2(b)	nitrogen ;	**IGNORE** N if it is the only response	**(1)**

Question Number	Answer	Additional Guidance	Mark
2(c)	1. glycosidic bond correctly drawn ; 2. molecule of water shown to be produced ; 3. remaining groups around disaccharide drawn correctly ;	1. **IGNORE** labelling of bond 2. **ACCEPT** water named or formula 3. **DO NOT ACCEPT** two separate glucose molecules NB: check carefully H on C5	**(3)**

Question Number	Answer	Additional Guidance	Mark
2 (d)	1. idea that water can form {hydrogen bonds / eq} ; and any one from 2. water is a solvent / {ions / polar molecules / eq } can {dissolve / be transported / eq } in water 3. reference to cohesion/adhesion 4. idea of hydrogen bonds holding water together as a liquid, so that it can move in mass flow systems 5. suitable ref. to specific heat capacity 6. idea of distribution of thermal energy around body 7. reference to high latent heat of vaporisation ;	1. **ACCEPT** water is slightly charged, description of charges on O and /or H IGNORE polar/ dipole as stated in Q stem 2. **ACCEPT** named polar molecule IGNORE non polar molecules dissolving 3. **ACCEPT** specific example e.g. surface tension on a pond 5. **ACCEPT** thermal buffer / needs a lot of energy to change the temperature / eq **IGNORE** pH buffer	**(2)**

Question Number	Answer	Comments	Mark
3(a)	(QWC– Spelling of technical terms must be correct and the answer must be organised in a logical sequence) 1. (α) *glucose* ; 2. *glycosidic* {bonds / links} ; 3. *amylose* and *amylopectin* ; 4. *amylose* has 1- 4 *(glycosidic)* {bonds / links} **AND** *amylopectin* has 1- 4 and 1- 6 (glycosidic) bonds / eq ; 5. *amylose* is {spiralled / coiled} ; 6. *amylopectin* is branched / eq ; 7. compact *molecule* / eq ;	QWC spelling of words in italics should be correct. Penalise just once – ALLOW max score of 5 if 6 mpts met but one lost due to spelling mistake.	**(5)**

Question Number	Answer	Additional guidance	Mark
3(b)(i)	1. speeds up the rate of reaction / eq ; 2. without being {changed/used up / eq} ; 3. lowers activation energy / provides an alternative reaction pathway / eq ; 4. does not change {products / position of equilibrium / eq } / eq ;		**(2)**

Question Number	Answer	Additional guidance	Mark
3(b)(ii)	1. breaks the (glycosidic) bonds / eq ; 2. reference to use of water ;	1. IG RE hydrogen bonds 2. NOT makes water / eq	**(2)**

Question Number	Answer	Additional guidance	Mark
3 (c)	idea that { maltose / disaccharide / glucose / monosaccharide} {is produced / tastes sweet} ;	ALLOW dextrins / sugar NOT any other named sugar eg sucrose	**(1)**

Question Number	Answer	Additional guidance	Mark
4(a)(i)	1. eukaryote cells have { membrane bound organelles / examples of membrane bound organelle } and prokaryotes do not ; 2. DNA within a nucleus in Eukaryota but not in Bacteria / linear chromosomes in Eukaryota circular in Bacteria ; 3. larger ribosomes in Eukaryota / 80S ribosomes in Eukaryota and 70S in Bacteria / eq ; 4. Bacteria contain { plasmids / pili / peptidoglycan cell wall /eq } and Eukaryota do not ;	1. e.g. nucleus 4. CCEPT mesosomes	**(2)**

Question Number	Answer	Mark
4(a)(ii)	ribosomes ;	**(1)**

Question Number	Answer	Mark
4(b)(i)	rough endoplasmic reticulum / rER / RER ;	**(1)**

Question Number	Answer	Mark
4(b)(ii)	A – Golgi apparatus ;	**(1)**

Question Number	Answer	Additional guidance	Mark
4(b)(iii)	***QWC – Spelling of technical terms must be correct and the answer must be organised in a logical sequence.** 1. reference to involvement of *ribosomes* on the { rER / *rough endoplasmic reticulum* } ; 2. *amino acids* {being joined by *peptide* bonds / forming *polypeptide* chains / forming *primary* structure of protein } ; OR {folded into 3-D shape / *secondary* or *tertiary* structure} in rER ; 3. packaged into *vesicles* at the end of the rER / *vesicles* {move to / transported to / fuse with / eq} the *Golgi apparatus* ; 4. idea that { *protein*/ *enzyme* } *modified* in *Golgi apparatus* ; 5. (*modified protein* / *enzyme* / eq) packaged into (*secretory*) *vesicles* (by *Golgi apparatus*) / eq ; 6. *exocytosis* by *secretory vesicles* / *fusion* of *vesicles* with cell (surface) *membrane* / eq ;	***QWC - Emphasis is spelling** ACCEPT X, Y, Z where appropriate.	**(4)**

Question Number	Answer	Additional guidance	Mark
4(c)	1. different shape molecule requires different enzymes / reference to active site having to have different shape ; 2. cellulose is made of β glucose and starch is made of α glucose / eq ; 3. 1,6 glycosidic bonds only in starch ; 4. starch made of amylose and amylopectin ; 5. cellulose is linear / starch is {branched / helical / eq} / eq ;		**(4)**