

Topic 5 Biology

Booklet 1 of 4

Revision Questions

Photosynthesis

MARK SCHEME

Jan 2010

Number	Answer	Mark
1(a)(i)	A ;	(1)

Question Number	Answer	Mark
1(a)(ii)	D ;	(1)

Question Number	Answer	Mark
1(a)(iii)	A ;	(1)

Question Number	Answer	Mark
1(b)	<ol style="list-style-type: none"> 1. ref to thylakoids ; 2. (made of) membranes ; 3. (arranged as) {stacks / grana / eq} ; 4. contain {pigment / chlorophyll} / eq ; 5. (arranged as) quantasomes / photosystems ; 	<p>maximum (3)</p>

Question Number	Answer	Mark
1(c)(i)	<ol style="list-style-type: none"> 1. $(62.4 / 162) \times 100$; [accept alternative correct working] 2. 38.5(%) ; [must be to 1 dp] 	(2)

Jan 2010

Question Number	Answer	Mark
1(c)(ii)	<ol style="list-style-type: none"> 1. ref to different lighting has little effect / little variation in percentage grain yields ; 2. variation in percentage is less than 3 / eq ; 3. which is (probably) {not significant/ insignificant} ; 4. yield is {less / eq} for low pressure sodium lamps ; 5. the best yield is metal halide / eq ; 	maximum (3)

Question Number	Answer	Mark
1(c)(iii)	<p>Any two from</p> <ol style="list-style-type: none"> 1. crops can be grown {out of season / all year round} / eq ; 2. plants photosynthesise 24 hours a day / eq ; 3. idea of less physical damage from {weather / animals / eq} ; 4. pest control easier / eq ; 5. ref to control of other named factor, eg CO₂, temperature, humidity, water supply ; 	maximum (2)

Jan 2010

Question Number	Answer	Mark
2(a)	<ol style="list-style-type: none"> 1. idea of reflection ; 2. reference. to {incorrect / eq } {wavelength / colour / frequency} ; 3. idea of {not hitting the {chloroplast / chlorophyll}} / it is transmitted ; 4. idea of light being in excess e.g. at max. photosynthesis so more light can be used ; 	max (2)

Question Number	Answer	Mark
2(b)(i)	{joules / energy} per {square metre / metre squared / (unit) area} per {year / unit time} ;	(1)

Question Number	Answer	Mark
2(b)(ii)	<p>Award 2 marks for correct answer (84.8 / 84.84)</p> <ol style="list-style-type: none"> 1. correct subtraction (24.4 - 3.7 / 20.7) ; 2. correct multiplication by 100 ÷ 24.4 ; <p>[consequential errors apply]</p>	(2)

Question Number	Answer	Mark
2(b)(iii)	B ;	(1)

Question Number	Answer	Mark
2(c) [QWC]	<p>(QWC - Spelling of technical terms (<i>shown in italics</i>) must be correct and the answer must be organised in a logical sequence)</p> <ol style="list-style-type: none"> 1. reference to {<i>thylakoids</i> / <i>thylakoid</i> (membranes)} ; 2. in {<i>granum</i> / <i>grana</i>} ; 3. (light energy) raises energy level of <i>electrons</i> / {<i>chlorophyll</i> / <i>electrons</i>}excited / eq ; 4. <i>electrons</i> released from {<i>chlorophyll</i> / photosystem / eq} / eq ; 5. reference to <i>electron</i> {carrier / eq} ; 6. reference to series of {redox / oxidation & reduction / eq} reactions ; 7. reference to energy level of <i>electrons</i> {falls / eq} ; 8. reference to {synthesise ATP from ADP +P / phosphorylate ADP} ; 9. reference to <i>photophosphorylation</i> ; 10. reference to ATP {<i>synthetase</i> / <i>synthase</i> / <i>ase</i>} ; 11. reference to {<i>chemiosmosis</i> / eq} ; 12. idea of <i>electrons</i> from {<i>photolysis</i> / eq} used to replace those lost ; 13. reference to involvement of {accessory pigments / named example} ; 	<p>max (6)</p>

June 2010

Question Number	Answer	Mark
3(a)(i)	C ;	(1)

Question Number	Answer	Mark
3(a)(ii)	C ;	(1)

Question Number	Answer	Mark
3(b)(i)	temperature ;	(1)

Question Number	Answer	Mark
3(b)(ii)	<ol style="list-style-type: none"> 1. rate of growth increases as temperature increases {between 13°C and 22°C / up to 22°C} ; 2. rate of growth decreases {between 22°C and 25°C / above 22°C} ; 3. use of manipulated data to support above e.g. increases by {0.7 (a.u.) / 4.5 times}, decreases by 0.1 (a.u.) ; 4. reference to enzymes involved (in growth) ; 5. molecules {move about more / have more kinetic energy}, as temperature increases ; 6. (therefore) {enzyme and substrate (molecules) collide more / rate of enzyme-substrate complexes formation increases} as temperature increases ; 7. correct reference to denaturation of some {enzyme / protein / eq} (molecules) ; 8. (therefore) rate of {growth / reactions} decreases as fewer enzyme molecules available ; 	max (4)

June 2010

Question Number	Answer	Mark
3(b)(iii)	<ol style="list-style-type: none"> 1. idea that (each temperature) has same light intensity ; 2. correct reference to must be above {threshold / compensation point} ; 3. (below which) no net photosynthesis takes place / eq ; 4. reference to {so light is not limiting factor / so temperature is the limiting factor}; 5. photosynthesis produces {material / eq} needed for growth / eq ; 	max (3)

Question Number	Answer	Mark
3(b)(iv)	<ol style="list-style-type: none"> 1. {wavelength / colour / frequency} of light ; 2. CO₂ concentration / eq ; 3. pH / eq (of solution) ; 4. reference to {mineral / eq} ; 	max (2)

June 2010

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

Question Number	Answer	Mark
1(a)(ii)	D ;	(1)

Question Number	Answer	Mark
1(a)(iii)	D ;	(1)

Question Number	Answer	Mark
1(b)(i)	<ol style="list-style-type: none"> 1. idea of carbon fixation produces {GP / eq} ; 2. (product) is converted to {starch / sugar / eq} ; 3. {faster / eq} C-fixation means faster {sugar / starch / eq} production / eq ; 4. reference to rate of {growth / development} depends on rate of carbon fixation ; 5. reference to increased GPP (of crop) ; 	<p>max (3)</p>

Jan 2011

Question Number	Answer	Mark
1(b)(ii)	<ol style="list-style-type: none"> reference to effect of temperature change on {kinetic energy / movement} of {molecules / particles / eq} / eq ; therefore this effects number of {collisions / enzyme-substrate complex} ; 	(2)

Question Number	Answer	Mark
1(b)(iii)	<ol style="list-style-type: none"> A ; [award if written in text instead] <p>Any four from:</p> <ol style="list-style-type: none"> idea that (in Central Europe) {temperatures never reach 25°C / data for 25°C is irrelevant} / 14°C is {within the range / close to the average temperature} ; {mean / eq} temperatures (in Central Europe) {15.25 / 15.3}°C ; A has highest rates of CO₂ fixation at 14°C / eq ; (therefore) A {will grow well / eq} in temperature (range) of Central Europe / eq ; {B / C / D / E / F / others} would have relatively low {growth / yield / eq} at 14°C / eq ; 	max (5)

Jan 2011

Question Number	Answer	Mark
7(a)(i)	<ol style="list-style-type: none"> drawing mark - recognisable {granum / grana} with clear stacks (of thylakoids / eq) shown / eq; label mark - {granum / grana / thylakoids} labelled / eq ; 	(2)

Question Number	Answer	Mark									
7(a)(ii)	<table border="1"> <thead> <tr> <th>Statement</th><th>True</th><th>False</th></tr> </thead> <tbody> <tr> <td>Electrons in chlorophyll are excited as light energy is absorbed</td><td>✓</td><td></td></tr> <tr> <td>The energy absorbed by chlorophyll is used to generate ADP and NADP</td><td></td><td>✓</td></tr> </tbody> </table> <p>1 mark each correct row ;;</p>	Statement	True	False	Electrons in chlorophyll are excited as light energy is absorbed	✓		The energy absorbed by chlorophyll is used to generate ADP and NADP		✓	(2)
Statement	True	False									
Electrons in chlorophyll are excited as light energy is absorbed	✓										
The energy absorbed by chlorophyll is used to generate ADP and NADP		✓									

Question Number	Answer	Mark
7(a)(iii)	<ol style="list-style-type: none"> reference to energy from light ; reference to photolysis ; of water ; 	(2)

Question Number	Answer	Mark																														
7(b)(i)	<table><tr><th>Position on shore</th><th><i>Ulva lactuca</i></th><th><i>Schizymenia dubyi</i></th></tr><tr><td>Top of the shore</td><td>✓</td><td></td></tr><tr><td>Middle of the shore</td><td></td><td></td></tr><tr><td>Lower down the shore</td><td></td><td></td></tr><tr><td>All regions</td><td></td><td>✓</td></tr></table> <p>OR</p> <table><tr><th>Position on shore</th><th><i>Ulva lactuca</i></th><th><i>Schizymenia dubyi</i></th></tr><tr><td>Top of the shore</td><td></td><td></td></tr><tr><td>Middle of the shore</td><td></td><td></td></tr><tr><td>Lower down the shore</td><td></td><td></td></tr><tr><td>All regions</td><td>✓</td><td>✓</td></tr></table> <p>1 mark each correct column ;;</p>	Position on shore	<i>Ulva lactuca</i>	<i>Schizymenia dubyi</i>	Top of the shore	✓		Middle of the shore			Lower down the shore			All regions		✓	Position on shore	<i>Ulva lactuca</i>	<i>Schizymenia dubyi</i>	Top of the shore			Middle of the shore			Lower down the shore			All regions	✓	✓	(2)
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Question Number	Answer	Mark
7(b)(ii)	<p>general points:</p> <ol style="list-style-type: none"> 1. idea of (rate of) growth is linked to (rate of) photosynthesis ; 2. idea of top of the shore is shallower water where most wavelengths are available / lower shore is deeper water where only green (and blue) available ; 3. idea that red weeds {reflect / do not absorb} red light OR green weeds {reflect / do not absorb} green light ; <p><i>Ulva lactuca</i> / green seaweed:</p> <ol style="list-style-type: none"> 4. high(est) rates in {red / blue} light / eq / {very low / lowest} in green light ; 5. would grow well if {all / (blue and) red} light available ; <p><i>Schizymenia dubyi</i> / red seaweed:</p> <ol style="list-style-type: none"> 6. high(est) rate in green light / eq ; 7. can grow where only green light available / any light available / eq ; 	(4)

Question Number	Answer	Mark
2(a)(i)	C ;	(1)

Question Number	Answer	Mark
2(a)(ii)	B ;	(1)

Question Number	Answer	Mark
2(a)(iii)	C ;	(1)

Question Number	Answer	Mark
2(b)	<p>ACCEPT any mark point from a clearly annotated diagram</p> <ol style="list-style-type: none"> 1. reference to {granum / grana} ; 2. reference to (a granum is) a stack of {thylakoids / membranes} OR grana are connected by lamellae ; 3. reference to (thylakoids contain) {electron carriers / eq} / chlorophyll / photosystems ; 4. reference to (membranes contain) {ATPase / ATPase channel} ; 5. idea that {electron carriers / ATPase / eq} are associated with {thylakoid / thylakoid membranes} ; 	(3)

Jan 2012

Question Number	Answer	Mark
2(c)	<ol style="list-style-type: none"> 1. GALP is a 3C molecule / eq ; 2. reference to formation of {glucose / hexose/ 6C sugar} (from GALP) ; 3. idea of enzymes involved in the synthesis of {glucose / cellulose} ; 4. idea that cellulose consists of {β-glucose / beta glucose } ; 5. joined by glycosidic bonds / eq; 6. reference to 1-4 (bonds) ; 7. reference to condensation reactions (between glucoses) ; 8. idea that cellulose is a long chain molecule e.g. polysaccharide, polymer ; 9. {unbranched / eq} molecule ; 	(5)

Jan 2012

Question Number	Answer	Mark
4(a)	D - stroma;	(1)

Question Number	Answer	Mark
4(b)(i)	<ol style="list-style-type: none"> 1. idea that samples (of cells) can be taken {easily / eq} ; 2. reference no damage to {plant / leaf / other cells} (during sampling) / eq ; 3. idea of carbon dioxide level (in water) can be {adjusted / maintained / changed / eq} (easily) ; 4. idea of {RuBP / GP / products / eq} cannot pass into {other cells / rest of plant} ; 5. reference to only one kind of cell / eq ; 6. idea of controlling the {mass / number/surface area} of cells ; 7. idea that genetically-similar cells used ; 	(2)

Question Number	Answer	Mark
4(b)(ii)	<ol style="list-style-type: none"> 1. light is needed for light-dependent reaction ; 2. light (intensity) will not be a limiting factor / eq ; 3. idea that {the effect of carbon dioxide concentration can be seen / carbon dioxide (concentration) is (only) limiting factor / eq} ; 4. {ATP / NADPH / eq} produced during light-dependent reactions ; 5. {ATP / NADPH / light-dependent products / eq} required for {light-independent reactions / Calvin cycle / carbon dioxide fixation} ; 	(3)

Question Number	Answer	Mark
4(b)(iii)	<ol style="list-style-type: none"> 1. both RuBP and GP levels constant until carbon dioxide {lowered / eq} ; 2. ref to (RuBP and GP in) Calvin cycle ; <p>RuBP</p> <ol style="list-style-type: none"> 3. (at lower carbon dioxide levels) the RuBP increases and drops (and then stays constant) ; 4. rises because being regenerated / eq ; 5. falls as being used to {fix / eq} carbon dioxide ; 6. idea that RuBP level remains constant once (new) equilibrium reached ; <p>GP</p> <ol style="list-style-type: none"> 7. (at lower carbon dioxide levels) the GP drops (and then stays constant) ; 8. drops because less {carbon dioxide available to convert into GP} / less carbon fixation / eq} ; 9. levels out at a lower level as carbon dioxide still available but at lower level; 10. credit correct manipulation of figures for a description of either RuBP or GP ; 	(6)

Question Number	Answer	Additional guidance	Mark
5(a)	<ol style="list-style-type: none"> 1. idea that products of light-dependent stage are {needed for / used in / eq} {light-independent stage / Calvin cycle} ; 2. reference to (products of light-dependent stage) are {reduced NADP / eq} and ATP ; 3. reference to use of {reduced NADP / eq} for {reduction / eq} of {carbon dioxide / GP / eq} ; 4. reference to use of ATP as source of energy ; 	3. Accept source of hydrogen ions for GALP Ignore ref to ATP	(3)

Question Number	Answer	Mark
5(b)(i)	D volume of oxygen produced ;	(1)

Question Number	Answer	Additional guidance	Mark
5(b)(ii)	<ol style="list-style-type: none"> 1. (minimum temperature) is {between 0 °C and 10 °C / above 0 °C but less than 10 / 10 °C} ; 2. idea of no photosynthesis at 0°C but photosynthesis is taking place at 10 °C ; 3. reference to no {data / readings / measurements / evidence / eq} between 0 °C and 10 °C ; 4. idea that at 0 °C water is frozen ; 	3. Accept if correct temp range has been given already	(2)

Question Number	Answer	Additional guidance	Mark
5(b)(iii)	<ol style="list-style-type: none"> reference to abiotic factors {are non-living / non-biological / do not involve organisms / eq} ; idea that other factors need to be kept constant ; 	2. Ignore controlled	(2)

Question Number	Answer	Additional guidance	Mark
5(b)(iv)	<p>Supporting conclusion:</p> <ol style="list-style-type: none"> idea that shape of graph is typical of an enzyme-temperature graph ; rate increases (up to 30 °C) because more {enzyme-substrate complexes / collisions between enzymes and substrates} / eq ; rate decreases (after 30°C) due to enzyme denaturation / eq ; <p>Not supporting conclusion:</p> <ol style="list-style-type: none"> idea that other factors could be affecting photosynthesis ; idea of {gas / oxygen / carbon dioxide} solubility changing with temperature ; idea of {correlation / not causation} ; 	1. idea that rate of photosynthesis is affected by temperature in a similar way to enzymes	(4)

Question Number	Answer	Additional Guidance	Mark
2(a)(i)	<ol style="list-style-type: none"> 1. idea of {fast / maximum} {gas exchange / uptake of carbon dioxide / eq}; 2. idea of penetration of light ; 3. idea that carbon dioxide is used in the {light-independent stage / Calvin cycle / formation of GP}; <p>OR</p> <p>idea that light is used in {light-dependent stage / photolysis / photophosphorylation / eq } ;</p>	Accept CO ₂ but ignore incorrect formula	(2)

Question Number	Answer	Additional Guidance	Mark
2(a)(ii)	<ol style="list-style-type: none"> 1. transport (in xylem) of water (to the leaves) / eq ; 2. transport (in phloem) of {sucrose / sugar / carbohydrates } (away from the leaves) / eq; 3. (water) for {light-dependent reaction / photolysis / source of hydrogen (ions)}; <p>OR</p> <p>idea of (transporting sugar) to make more room for more carbohydrate synthesis ;</p>	<p>Accept H₂O but ignore incorrect formula</p> <p>Accept phosphates but ignore mineral ions</p> <p>Not glucose or any other name sugars</p> <p>Accept reducing power, NADPH</p> <p>Accept (phosphates) for ATP synthesis</p>	(2)

Question Number	Answer			Additional Guidance	Mark
2(b)(i)	Reaction	Details	Structure	Not thylakoid space Ignore electron transport chain Not stoma / stomata Not stoma / stomata	(3)
			{thylakoid (membrane) / grana / granum} ;		
			stroma ;		
			stroma ;		

Question Number	Answer	Additional Guidance	Mark
2(b)(ii)	C ;		(1)

Question Number	Answer	Additional Guidance	Mark
2(b)(iii)	C ;		(1)

Question Number	Answer	Additional Guidance	Mark
2(b)(iv)	1. reference to conversion (of GALP) to glucose / eq; 2. (which is) β glucose ; 3. reference to formation of glycosidic bonds ; 4. between C_1 and C_4 / these bonds are 1-4 (glycosidic bonds) ; 5. by condensation ; 6. reference to {straight / unbranched} (chains of glucose) ; 7. reference to cellulose as a {polysaccharide / polymer of glucose / eq} ;	NB this is a question about the formation of cellulose, not its structure NB a reference to these bonds being formed must be made	(4)

Question Number	Answer	Additional Guidance	Mark
1(a)(i)	1. Molecule P - water / H_2O ; 2. Molecule Q - oxygen / O_2 ;		(1)

Question Number	Answer	Mark
1(a)(ii)	D ATP and reduced NADP ;	(1)

Question Number	Answer	Additional Guidance	Mark
1(a)(iii)	1. reference to RUBISCO as an {enzyme / catalyst} ; 2. in the Calvin cycle ; 3. involved in {carbon fixation / bonding of CO_2 to RuBP / reaction between CO_2 and RuBP / eq} ; 4. to form GP / eq ; 5. GP converted to GALP / eq ; 6. using ATP and {reduced NADP / NADPH} (CO_2 to GALP / GP to GALP) ;	1. ACCEPT catalyses 3. ACCEPT formation of 6C intermediate from RuBP 5. ACCEPT reduced to NB Award formation of GALP from reaction between CO_2 and RuBP if mp 4 not awarded	(4)

Question Number	Answer	Mark																																																			
1(b)(i)	C stroma	(1) COMP																																																			
Question Number	Answer	Additional Guidance	Mark																																																		
1(b)(ii)	<p>1. (image length) 76 / 76.5 / 77 (mm) ;</p> <p>2. (correct calculation = length /7500) / eq ;</p> <p>3. (correct units for given answer) μm / eq ;</p> <table><tr><th>length</th><th>answer in μm</th><th>answer in mm</th><th>answer in cm</th><th>answer in m</th></tr><tr><td>7.6 (cm)</td><td>10</td><td>0.01</td><td>0.001</td><td>0.00001</td></tr><tr><td>76 (mm)</td><td>10.1</td><td>0.0101</td><td>0.00101</td><td>0.0000101</td></tr><tr><td>76000 (μm)</td><td>10.13</td><td>0.01013</td><td>0.001013</td><td>0.00001013</td></tr><tr><td>7.65</td><td>10</td><td>0.01</td><td>0.001</td><td>0.00001</td></tr><tr><td>76.5</td><td>10.2</td><td>0.0102</td><td>0.00102</td><td>0.0000102</td></tr><tr><td>76500</td><td></td><td></td><td></td><td></td></tr><tr><td>7.7</td><td>10</td><td>0.01</td><td>0.001</td><td>0.00001</td></tr><tr><td>77</td><td>10.3</td><td>0.0103</td><td>0.00103</td><td>0.0000103</td></tr><tr><td>77000</td><td>10.27</td><td>0.01027</td><td>0.001027</td><td>0.00001027</td></tr></table>	length	answer in μm	answer in mm	answer in cm	answer in m	7.6 (cm)	10	0.01	0.001	0.00001	76 (mm)	10.1	0.0101	0.00101	0.0000101	76000 (μm)	10.13	0.01013	0.001013	0.00001013	7.65	10	0.01	0.001	0.00001	76.5	10.2	0.0102	0.00102	0.0000102	76500					7.7	10	0.01	0.001	0.00001	77	10.3	0.0103	0.00103	0.0000103	77000	10.27	0.01027	0.001027	0.00001027	<p>Correct answer with units = 3 marks</p> <p>2. CE applies</p> <p>3. CE applies ACCEPT as standard form</p>	(3) EP
length	answer in μm	answer in mm	answer in cm	answer in m																																																	
7.6 (cm)	10	0.01	0.001	0.00001																																																	
76 (mm)	10.1	0.0101	0.00101	0.0000101																																																	
76000 (μm)	10.13	0.01013	0.001013	0.00001013																																																	
7.65	10	0.01	0.001	0.00001																																																	
76.5	10.2	0.0102	0.00102	0.0000102																																																	
76500																																																					
7.7	10	0.01	0.001	0.00001																																																	
77	10.3	0.0103	0.00103	0.0000103																																																	
77000	10.27	0.01027	0.001027	0.00001027																																																	

Question Number	Answer	Additional Guidance	Mark
1(b)(iii)	<ol style="list-style-type: none"> 1. idea of compartmentalisation (from stroma) ; 2. site of light-dependent reaction ; 3. credit named molecules {within / on / eq} membrane ; 4. idea of {ATPase / eq } in (thylakoid) membranes ; 5. idea that (thylakoid) membranes provide a space for accumulation of H^+ ; 6. reference to photophosphorylation ; 	<ol style="list-style-type: none"> 1. ACCEPT description of separation 3. e.g. photosynthetic pigments / chlorophyll / carotenoids / photosystems / electron carrier proteins IGNORE electron acceptors 4. ACCEPT {ATP synthase / synthetase}, NADP reductase 6. ACCEPT chemiosmosis 	(3)

Question Number	Answer	Additional Guidance	Mark
4(a)	1. Idea that enzyme activity decreases ; 2. credit calculated reduction e.g. 0.6, 2.7 , 3.3 ; 3. Idea that an increase in temperature results in increase in kinetic energy ; 4. causing changes in bonds (in the enzyme) / eq ; 5. idea that enzyme is denaturing (above 40 °C) ; 6. idea that carbon fixation is reduced ;	5 ACCEPT fewer enzyme-substrate complexes NOT starts to denature	(5)

Question Number	Answer	Additional Guidance	Mark
4(b)	{RuBP / ribulose biphosphate} AND {carbon dioxide / CO ₂ } ;	ACCEPT Rubp / ribulose biphosphate NOT CO / CO ₂	(1)

Question Number	Answer	Mark
4(c)(i)	D valid ;	(1)

Question Number	Answer	Mark
4(c)(ii)	C measuring the activity at 1°C intervals between 35°C and 45°C ;	(1)

Question Number	Answer	Additional guidance	Mark
1(a)	<p>1. chloroplast only :</p> <p>grana, thylakoid (membrane / lumen), stroma, (inter granal) lamellae, starch {grains / granules};</p> <p>2. both chloroplasts and mitochondria :</p> <p>(double) membrane, ribosomes,;</p> <p>3. mitochondria only :</p> <p>matrix, stalked particles, {cristae / folded inner membrane} ;</p>	<p>NB TWO structures needed for each mark</p> <p>2 Ignore cytoplasm Accept (loop) DNA</p> <p>3 Ignore mesosomes</p>	(3)
1(b)(i)	<p>1. one glycerol and three fatty acids ;</p> <p>2. reference to ester bonds (between fatty acids and glycerol);</p> <p>3. idea that (triglycerides /fatty acids / hydrocarbon chains) may be saturated or unsaturated ;</p>	<p>3 Accept description of presence and absence of double carbon carbon bonds</p>	(3)

Question Number	Answer	Mark
1(b)(ii)	<p>1(b)(ii). The only correct answer is A - condensation</p> <p><i>B is not correct because hydrolysis breaks bonds</i></p> <p><i>C is not correct because this is not an oxidation reaction</i></p> <p><i>D is not correct because this is not a reduction reaction</i></p>	(1)

Question Number	Answer	Additional guidance	Mark
1(b)(iii)	<p>1. use of reduced NADP produced by light-dependent reaction;</p> <p>2. use of ATP produced by light-dependent reaction;</p> <p>3.(light-independent reaction produces) {GALP / trioses} used in synthesis of {FAs / glycerol / triglyceride} ;</p> <p>4. {GALP / trioses} converted to amino acids used to synthesise {proteins / enzymes} / eq ;</p> <p>5. idea of enzymes used in synthesis of triglycerides ;</p>	<p>3 Accept GALP to glucose to glycerol</p>	(4)