PEARSON EDEXCEL A-LEVEL BIOLOGY B · 9BI0

BIOLOGY



MARK SCHEME

TOPIC 1: BIOLOGICAL MOLECULES

LIPIDS

SCORE	PERCENTAGE
/25	%

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Mark Scheme

Q1.

Question Number	Answer	Mark
		(3)

Bond	Molecule that bond may be found in			
	carbohydrate only	lipid only	both carbohydrate and lipid	neither carbohydrate nor lipid
covalent	☐	☐	X	☐
ester	☐	X	☐	☐
hydrogen	X	☐	☐	☐

Q2.

Question Number	Answer	Additional Guidance	Mark
(i)	C 3 *A is incorrect because palmitic, myristic and stearic acid are saturated fats* *B is incorrect because palmitic, myristic and stearic acid are saturated fats* *D is incorrect because palmitic, myristic and stearic acid are saturated fats*		1

Question Number	Answer	Additional Guidance	Mark
(ii)	An answer that makes reference to four from the following: • %SFC for both decreases as temperature increases for both cocoa butter and palm oil / both have 5% SFC at 35 °C (1) • the % SFC of cocoa butter is higher at all temperatures (except 35 °C) (1) • because cocoa butter has higher percentage of / more saturated fat (1) • so fatty acid chains can associate with each other more easily (1) • the % SFC of cocoa butter decreases more steeply above 25 °C / larger decrease after 25°C (1)	**Accept** converse **Accept** converse **Accept** pack more tightly together / has straight chains/rods which pack tightly together higher density of intermolecular contacts/bonds	4

Q3.

Question Number	Answer	Mark
	An explanation that makes reference to the following: • fatty acid because it has a {carboxylic acid / COOH / carboxyl group} (1) • (mono)unsaturated because it has {a double bond / C=C / carbons with only one H} (1)	(2)

Q4.

Question Number	Answer	Additional Guidance	Mark
	An answer that makes reference to the following: • correct structure of glycerol (1) • correct structure of three fatty acids (1)	Max one mark if other molecules e.g. water added to right hand side **Accept** 3 x one fatty acid	2

Q5.

Question Number	Acceptable Answer	Additional Guidance	Mark
	D (proteins, nucleic acids, starch)		**(1)**

Q6.

Question Number	Answer	Additional Guidance	Mark
(i)	• an O drawn between the two covalent bonds		(1)
(ii)	**The only correct answer is A** **B** is incorrect because three water molecules (54) have to be subtracted,not one **C** is incorrect because three water molecules 54 have to be subtracted,not six hydrogens **D** is incorrect because three water molecules 54 have to be subtracted		(1)

Q7.

Question Number	Answer	Additional Guidance	Mark
(i)	An explanation that makes reference to three of the following: • because more viruses delivered (1) • because {lipid / sphere} can pass through cell membrane / no need to bind to (cell) receptors / can bind to any cell (1) • because {lipid / sphere} protects viruses from {enzymes / stomach acid / phagocytes / immune system} (1) • credit a link between one reason and the information given (1)	e.g. more cells infected so symptoms develop faster more cells infected so symptoms are worse virus particles not destroyed so more cells infected	(3)

Question Number	Answer	Additional Guidance	Mark
(ii)	An explanation that makes reference to two of the following: • because the lipids could be {targetted / broken down} (1) • by an enzyme (that breaks down lipid) (1) • resulting in {fewer virus particles arriving at cells (in one go) / exposure to immune system} (1)	**ACCEPT** using a drug that can penetrate the lipid **ACCEPT** therefore destroying the viruses **ACCEPT** {fewer / no} viruses (arriving at the cells)	(2)

Q8.

Question Number	Acceptable Answer	Additional guidance	Mark
	An explanation that makes reference to the following: • electron carrier components are on chloroplast membranes (1) • detergents disrupt the phospholipid bilayer in the membranes (1) • therefore electrons can no longer move along the chain (1)		**(3)**

Q9.

Question Number	Answer	Additional Guidance	Mark
	An explanation that makes reference to two of the following: • because a lipid molecule contains a higher proportion of hydrogen (than a carbohydrate molecule) (1) • therefore more reduced {NAD / FAD / coenzyme} (1) • therefore more hydrogen (ions) {to accumulate in the inter-membrane space / to produce a proton gradient / to pass through ATP synthase channels / for chemiosmosis / for oxidative phosphorylation} (1)	**ACCEPT** converse throughout **ACCEPT** NADH / $FADH_2$	(2)