PEARSON EDEXCEL A-LEVEL BIOLOGY B · 9BI0

BIOLOGY



EXAM QUESTION PACK

TOPIC 1: BIOLOGICAL MOLECULES

LIPIDS

SCORE	PERCENTAGE
/25	%

STEMUP

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Q1.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Lipids and carbohydrates are used as respiratory substrates.

The respiration of lipids generates more ATP than the respiration of carbohydrates.

The table shows bonds that may be found in carbohydrates and lipids.

Which box in each row shows whether the bond may be found in these molecules?

(3)

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

(Total for question = 3 marks)

Q2.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Palm plants and cocoa plants are used to produce lipids for the food industry.

Palm oil is produced from palm plants. Cocoa butter is produced from cocoa plants.

The fatty acid compositions of palm oil and cocoa butter are shown in the table.

Fatty acid	Chemical formula of fatty acid	Percentage of fatty acid found in palm oil and cocoa butter (%)	
		Palm oil	Cocoa butter
palmitic acid	$C_{16}H_{32}O_2$	45	27
oleic acid	$C_{18}H_{34}O_2$	40	31
linoleic acid	$C_{18}H_{32}O_2$	10	3
myristic acid	$C_{14}H_{28}O_2$	1	1
stearic acid	$C_{18}H_{36}O_2$	4	38

(i) How many of the named fatty acids shown in the table are saturated?

(1)

☒ **A** 1

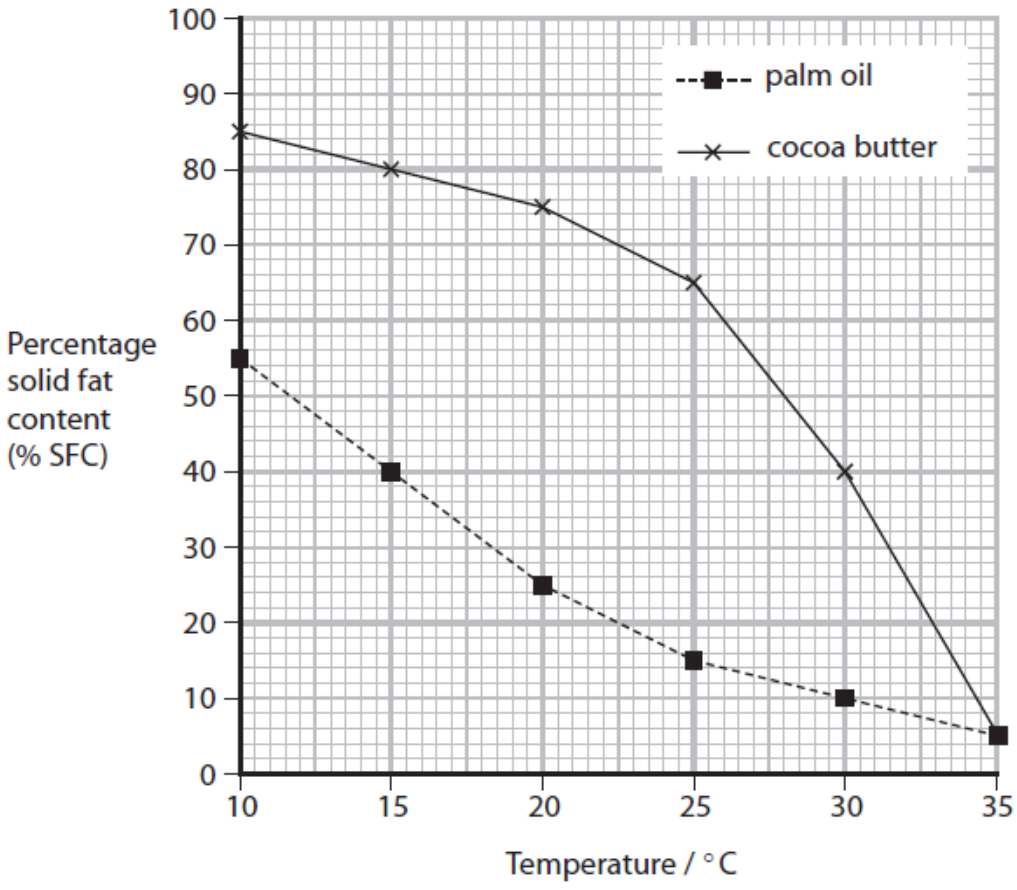
☒ **B** 2

☒ **C** 3

☒ **D** 4

(ii) The percentage solid fat content (% SFC) is a measure of how much of a lipid is solid at different temperatures.

The graph shows the effect of temperature on the % SFC for palm oil and for cocoa butter.



Comment on the effect of temperature on the % SFC of palm oil and of cocoa butter.

(4)

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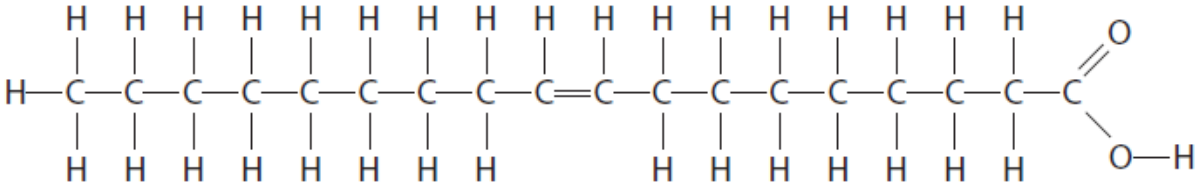
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(Total for question = 5 marks)

Q3.

Soya bean plants have been genetically modified (GM) to increase the concentration of certain organic molecules.

The diagram shows one of these molecules.



Explain what type of molecule is shown in the diagram.

(2)

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(Total for question = 2 marks)

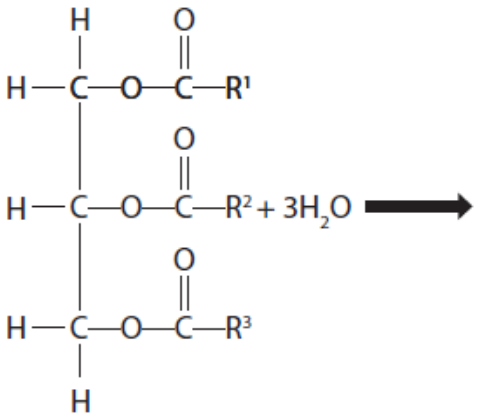
Q4.

Palm plants and cocoa plants are used to produce lipids for the food industry.

Palm oil is produced from palm plants. Cocoa butter is produced from cocoa plants.

Palm oil and cocoa butter are made of triglycerides composed of different fatty acids.

The diagram shows a triglyceride.



Complete the diagram to show the products of hydrolysis of this triglyceride.

(Total for question = 2 marks)

Q5.

Many of the chemicals found in living organisms are polymers.

Which of the following molecules are all polymers?

(1)

☒ **A** polypeptides, nucleotides, starch

☒ **B** polypeptides, starch, lipids

☒ **C** proteins, carbohydrates, lipids

☒ **D** proteins, nucleic acids, starch

Q6.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

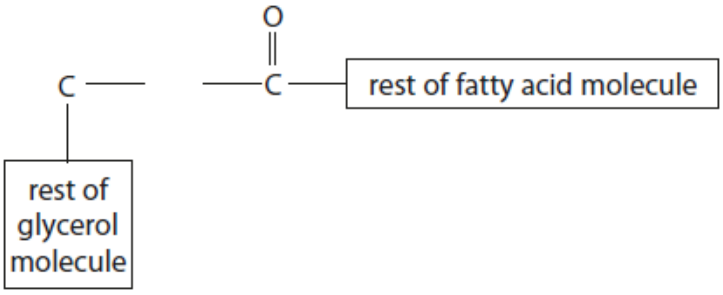
The structure of a lipid relates to its role in living organisms.

Triglycerides are lipids.

(i) The diagram shows part of a glycerol molecule and part of a fatty acid.

Complete the diagram to show the ester bond joining the fatty acid to the glycerol molecule.

(1)



(ii) The table shows the relative atomic mass of some elements.

Element	Relative atomic mass
carbon	12
hydrogen	1
nitrogen	14
oxygen	16

A triglyceride is made from a glycerol molecule and three fatty acids.

The molecular mass of the glycerol is 92 and the total molecular mass of the three fatty acids is 362.

Which is the molecular mass of this triglyceride?

(1)

☒ **A** 400

☒ **B** 436

☒ **C** 448

☒ **D** 454

(Total for question = 2 marks)

Q7.

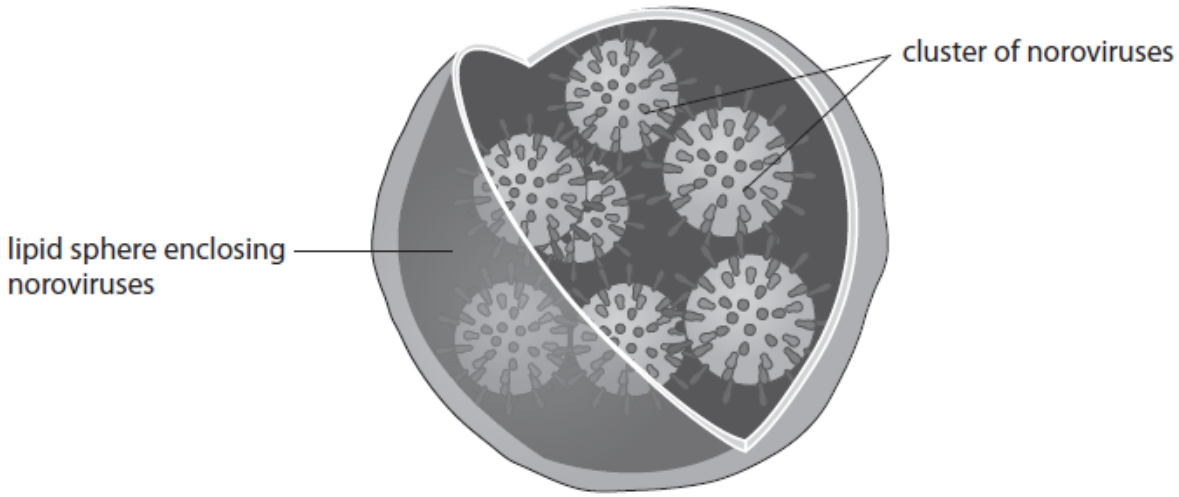
Norovirus is a single-stranded RNA, non-enveloped virus.

Norovirus is the most common cause of gastroenteritis.

Noroviruses can infect an animal as individual viruses or as a cluster of viruses inside a lipid sphere.

A cluster of viruses inside a lipid sphere is called a stealth sphere.

The diagram shows a stealth sphere.



(i) Animals infected with stealth spheres develop gastroenteritis very quickly and with severe symptoms.

Animals infected with individual noroviruses develop gastroenteritis more slowly and with less severe symptoms.

Analyse the information to explain these findings.

(3)

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(ii) Scientists are hoping that new treatments for norovirus infections can be developed to target the stealth sphere.

Analyse the information to explain how targeting the stealth sphere could be used to treat these infections.

(2)

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(Total for question = 5 marks)

Q8.

The electron carriers in chloroplasts are inhibited by detergent.

Detergents dissolve lipids.

Explain how detergents inhibit the functioning of electron carriers in chloroplasts.

(3)

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Q9.

Lipids and carbohydrates are used as respiratory substrates.

The respiration of lipids generates more ATP than the respiration of carbohydrates.

The electron transport chain uses hydrogen ions to generate ATP.

Explain why the respiration of lipids generates more ATP than the respiration of carbohydrates.

(2)

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(Total for question = 2 marks)