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2.2 Carbohydrates & Lipids

Hard

BIOLOGY

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EXAM PAPERS PRACTICE

2.2 Carbohydrates & Lipids

Question Paper

Course	DP IB Biology
Section	2. Molecular Biology
Topic	2.2 Carbohydrates & Lipids
Difficulty	Hard

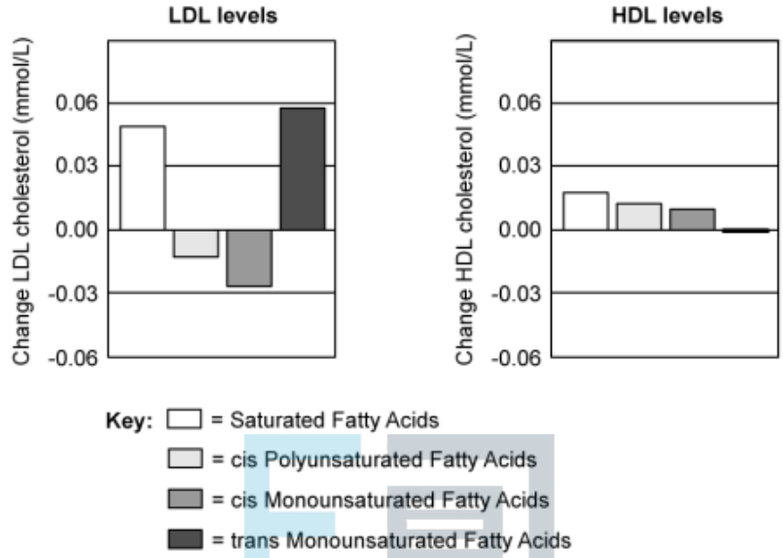
Time allowed: 10

Score: /5

Percentage: /100

Question 1

A study was conducted to investigate the effect of different fatty acids on the levels of low-density lipoprotein (LDL) and high-density lipoprotein (HDL) in the human bloodstream. An increase in LDL levels in the blood has been linked to an increase in the risk of developing coronary heart disease (CHD). The results are shown in the graphs below.



Which of the following conclusions would be the most valid concerning the data?

A. *trans* monounsaturated fatty acids led to the most significant change in the HDL levels, leading to a decreased risk of developing CHD

B. All the fatty acids led to an increase in the HDL levels in the bloodstream, which would lead to a decrease in the risk of developing CHD

C. *cis* monounsaturated fatty acids caused the greatest decrease in LDL levels and would result in a lowered risk of developing CHD

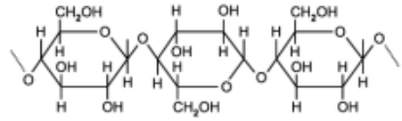
D. *cis* monounsaturated fatty acids led to a smaller decrease in LDL levels than *cis* polyunsaturated fatty acids which would lead to a greater decrease in the risk of developing CHD

[1 mark]

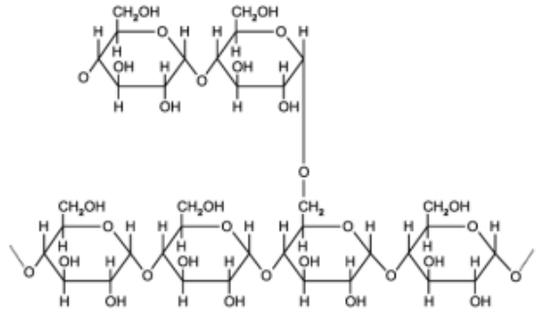
Question 2

The diagram below shows several different biological molecules (**Q**, **R**, **S** and **T**).

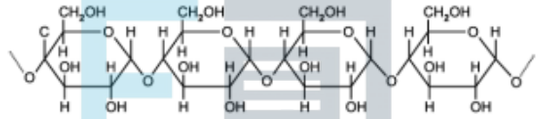
Q



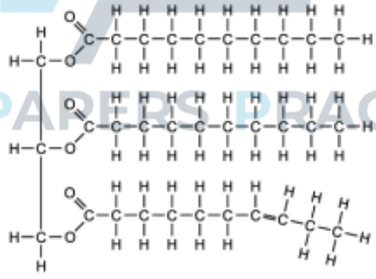
R



S



T



Which row of the table below correctly identifies some of the products of hydrolysis of the molecules above?

	Q	R	S	T
A.	α-glucose	β-glucose	α-glucose	glycerol
B.	α-glucose	β-glucose	β-glucose	fatty acids
C.	β-glucose	α-glucose	β-glucose	glycerol
D.	β-glucose	α-glucose	α-glucose	fatty acids

[1 mark]

Question 3

Which of the following most accurately describes the formation of a lipid?

A. An ester bond forms between the -COOH group of three fatty acids and an -OH group on one glycerol molecule, along with the release of three molecules of water

B. An ester bond forms between the -COOH group of three fatty acids and a -CH group on one glycerol molecule, along with the release of three molecules of water

C. An ester bond forms between the -COOH group of three fatty acids and an -OH group on one glycerol molecule, along with the absorption of three molecules of water

D. An ester bond forms between the -COOH group of three fatty acids and a -CH group on one glycerol molecule, along with the absorption of three molecules of water

[1 mark]

Question 4

A study was conducted to investigate the effect of saturated fat intake on the risk of developing coronary heart disease (CHD) in women.

- The study involved 20 women, aged between 35 and 50, divided into two groups (**A** and **B**) of 10.
- Group **A** was given a diet rich in saturated fats, while group **B** followed a diet low in saturated fats.
- The levels of low-density lipoprotein (LDL) in their blood was monitored over a six month period. High LDL levels has been linked to an increase in the risk of developing CHD.

At the end of the study the levels of LDL in group **A** was much higher than that of group **B**. The scientists concluded that saturated fats increases the risk of developing CHD.

Which evaluation of their conclusion would be most valid?

A. The conclusion of the scientist may not be valid as they would have to repeat the investigation over a longer period of time, using animal test subjects

B. The conclusion of the scientists may not be valid as they should have monitored a larger number of women between the ages of 20 and 35

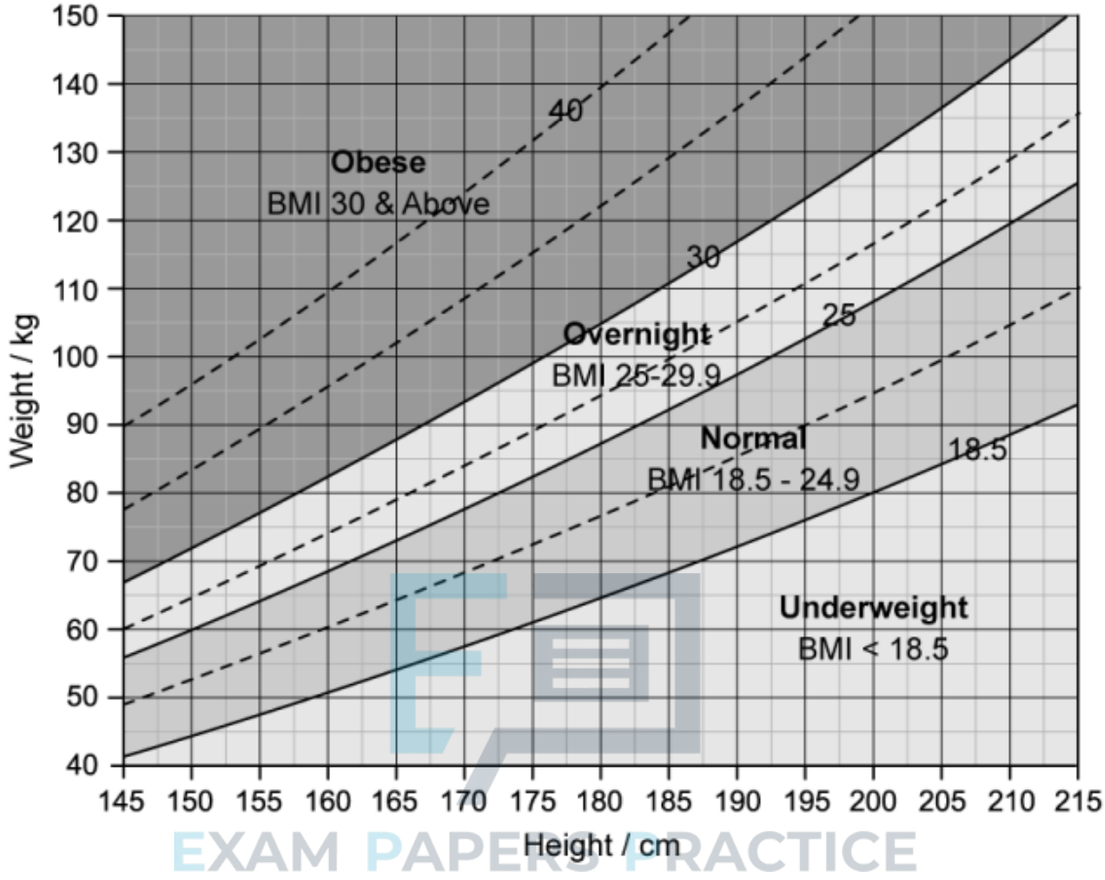
C. The conclusion of the scientists may not be valid as they should have taken into consideration the medical history of the women

D. The conclusion of the scientists may not be valid as they should have repeated their investigation with women over the age of 75

[1 mark]

Question 5

The nomogram below shows the range and classification of body mass index (BMI) values.



A person of height 170 cm has a mass of 105 kg.

What is the amount of mass this person would have to lose to reach a body mass within the normal BMI range?

A. 15 kg

B. 25 kg

C. 35 kg

D. 50 kg

[1 mark]