

APOLLO

Carbohydrates and lipids

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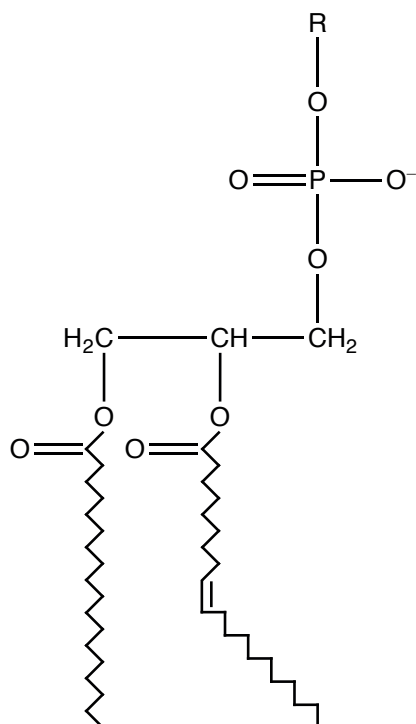
Biology

First assessment 2025

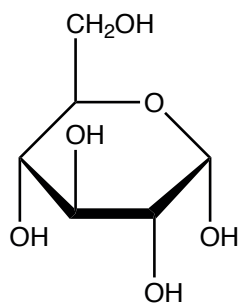
10 questions | questions

2. Which of these molecules is amphipathic?

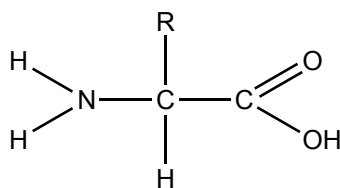
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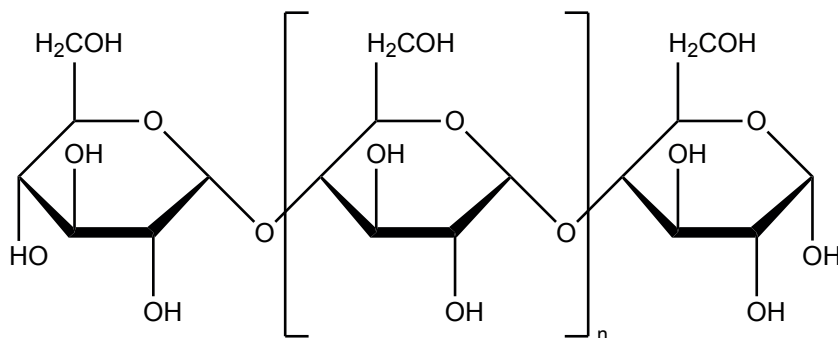
B.



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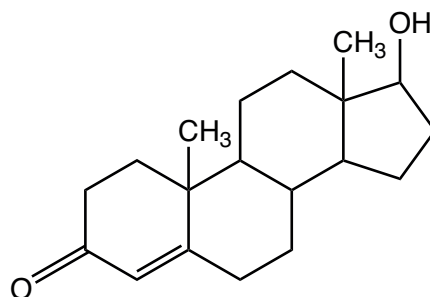


Turn over

- 3.** What describes the structure of cellulose?
- A. Branched with bonds between alpha-glucose and beta-glucose molecules
 - B. Branched with bonds between alpha-glucose molecules
 - C. Linear with bonds between alpha-glucose molecules
 - D. Linear with bonds between beta-glucose molecules

- 2.** What is the function of cellulose in plant cells?
- A. It increases the strength of cell walls.
 - B. It is a source of energy for plants.
 - C. It maintains the structure of the vacuole.
 - D. It increases the permeability of the cell membranes.

3. A simplified diagram of molecule X is shown.



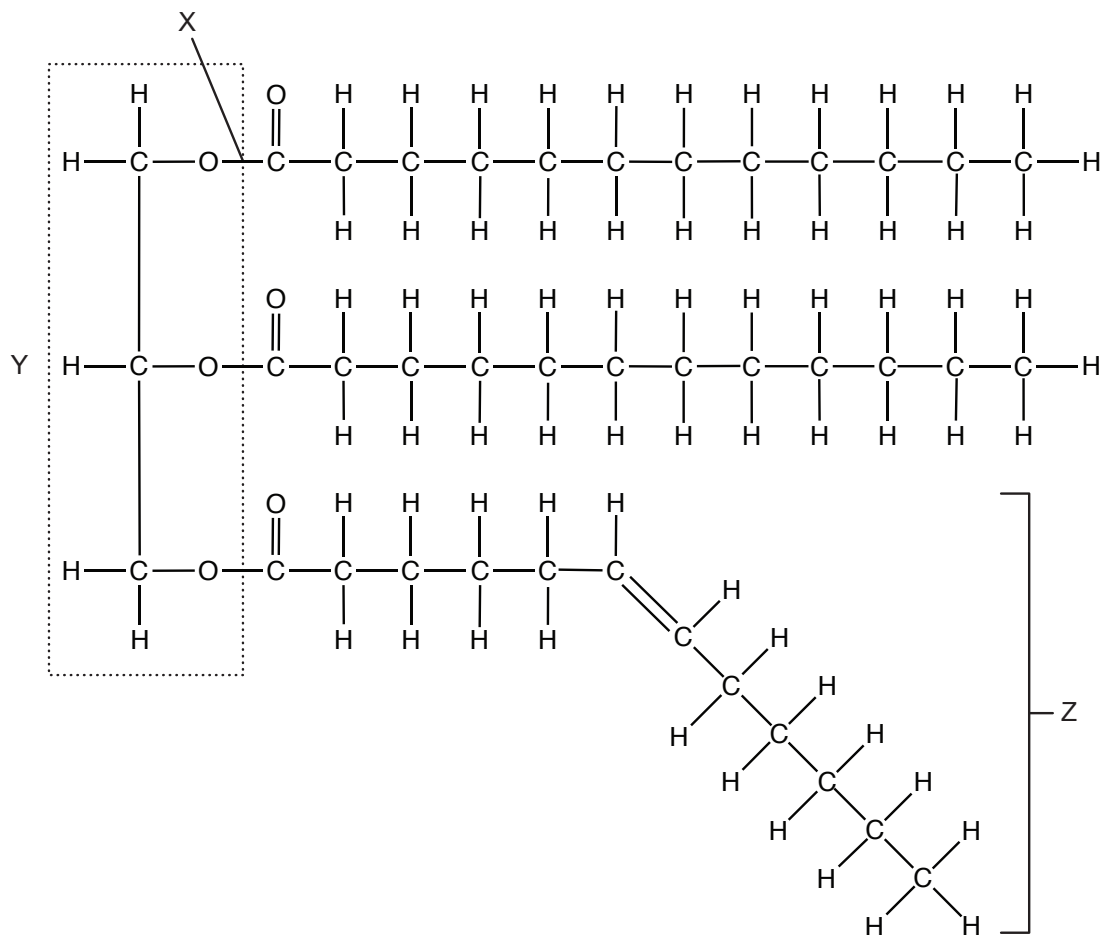
What describes molecule X?

- A. Lipid able to pass through the bilayer of membranes
- B. Lipid used for energy storage in mammals
- C. Carbohydrate transported in the blood
- D. Carbohydrate used for energy storage in plants

Section A

Answer **all** questions. Answers must be written within the answer boxes provided.

2. The diagram shows the structure of a triglyceride.



- (a) Identify the type of reaction used to form the covalent bond indicated by X. [1]

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- (b) Identify the molecule that was used to form part Y of the triglyceride. [1]

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(Question 2 continued)

(c) State the type of fatty acid shown as Z. [1]

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(d) Explain how the properties of triglycerides make them suitable for energy storage. [2]

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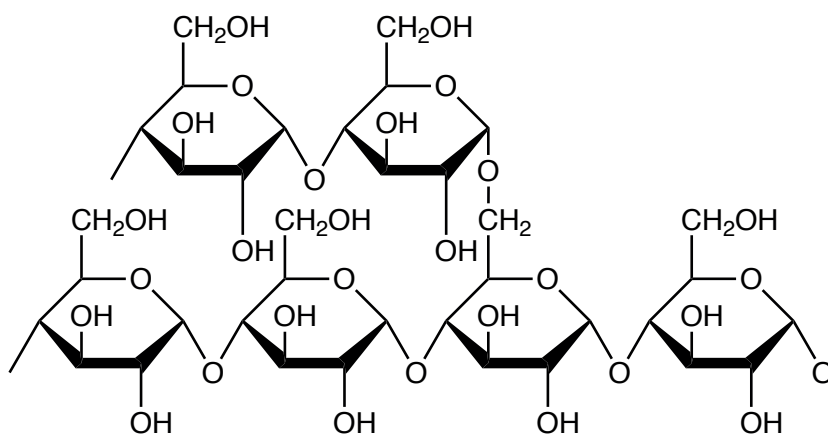
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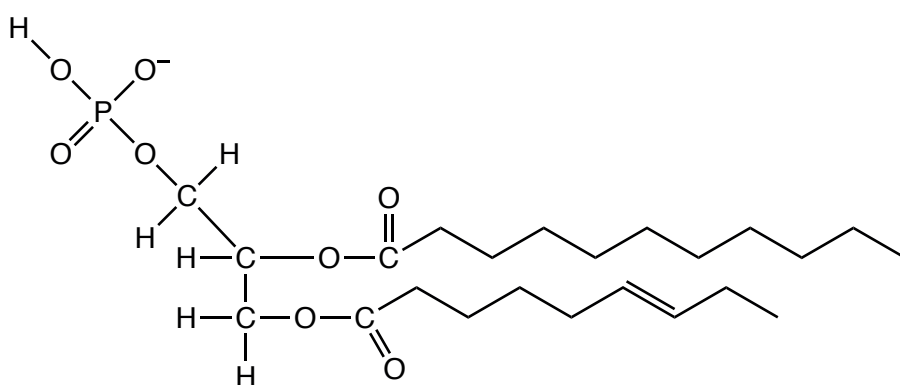


2. Which molecular diagram shows a phospholipid molecule?

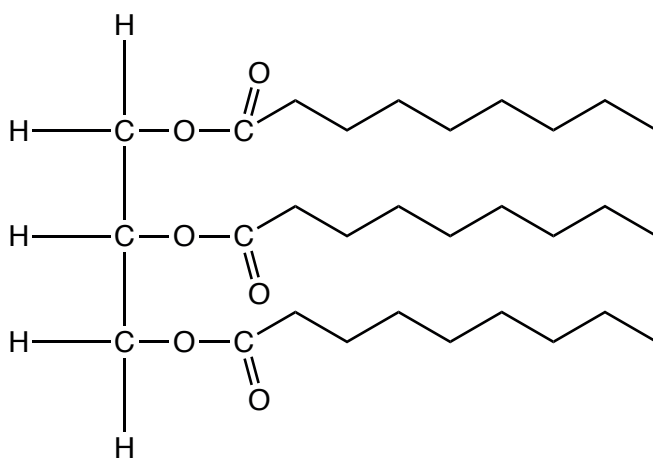
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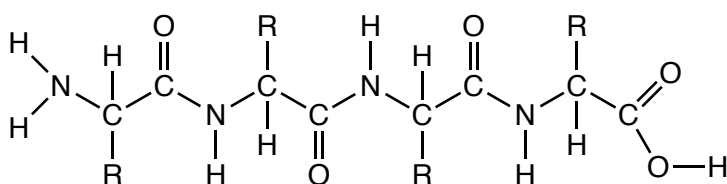
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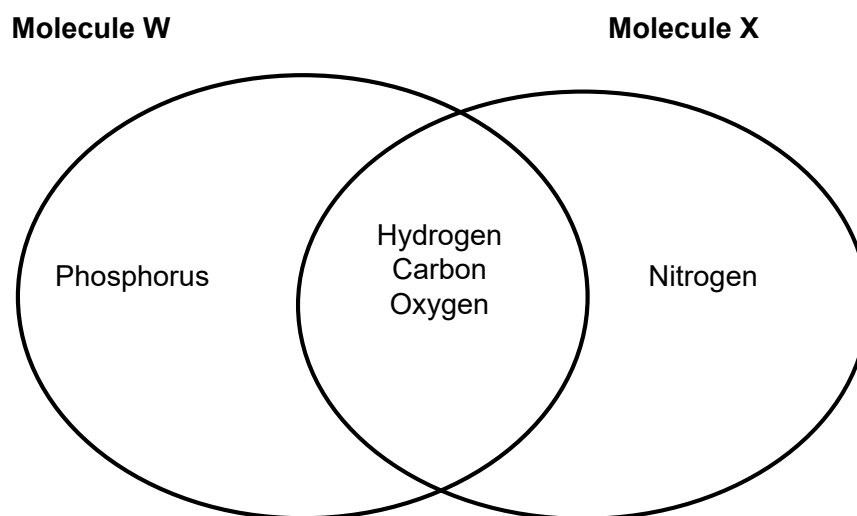


D.



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1. The diagram shows the elements present in two organic molecules, W and X. Which molecules could W and X be?



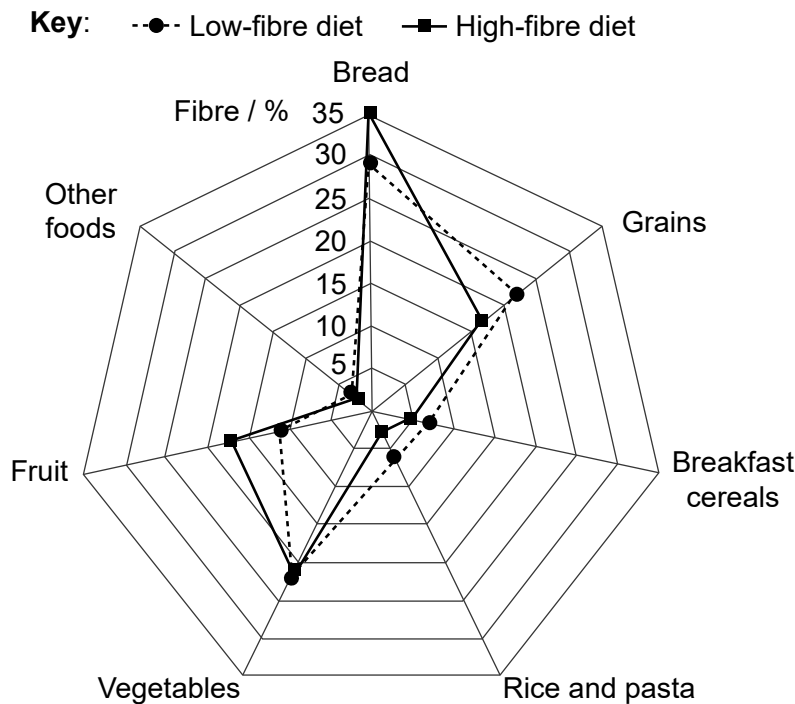
	Molecule W	Molecule X
A.	monosaccharide	amino acid
B.	nucleic acid	triglyceride
C.	phospholipid	protein
D.	triglyceride	fatty acid

- 3.** Which molecules are produced during the hydrolysis of a triglyceride molecule?
- A. Water and glycerol
 - B. Fatty acids and glycerol
 - C. Water and fatty acids
 - D. Water and lipids

Section A

Answer **all** questions. Answers must be written within the answer boxes provided.

1. A long-term study looked at the effect of diets with differing fibre content in 543 children between the ages of 8 months and 9 years. The children were divided into groups according to the amount of fibre in their diet. The chart shows the sources of fibre for the 9-year-olds as a percentage of the total fibre intake.



[Source: adapted from Ruottinen, S., Lagström, H.K., Niinikoski, H., Rönnemaa, T., Saarinen, M., Pahkala, K.A., Hakanen, M., Viikari, J.S.A. and Simell, O., 2010. *The American Journal of Clinical Nutrition*, 91(3), pp.651–661. REDACTED.]

- (a) (i) State the source of fibre that provides 5% of the fibre intake for those in the high-fibre group.

[1]

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- (ii) State the percentage of the daily fibre intake obtained from fruit by the low-fibre group.

[1]

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(Question 1 continued)

(b) Compare and contrast the fibre intake of the two groups. [2]

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(c) Explain whether it is possible to determine from the data which group eats the most grains in a day. [2]

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(d) Suggest with a reason, based on the data in the chart, **one** food that should be increased for children on the low-fibre diet. [2]

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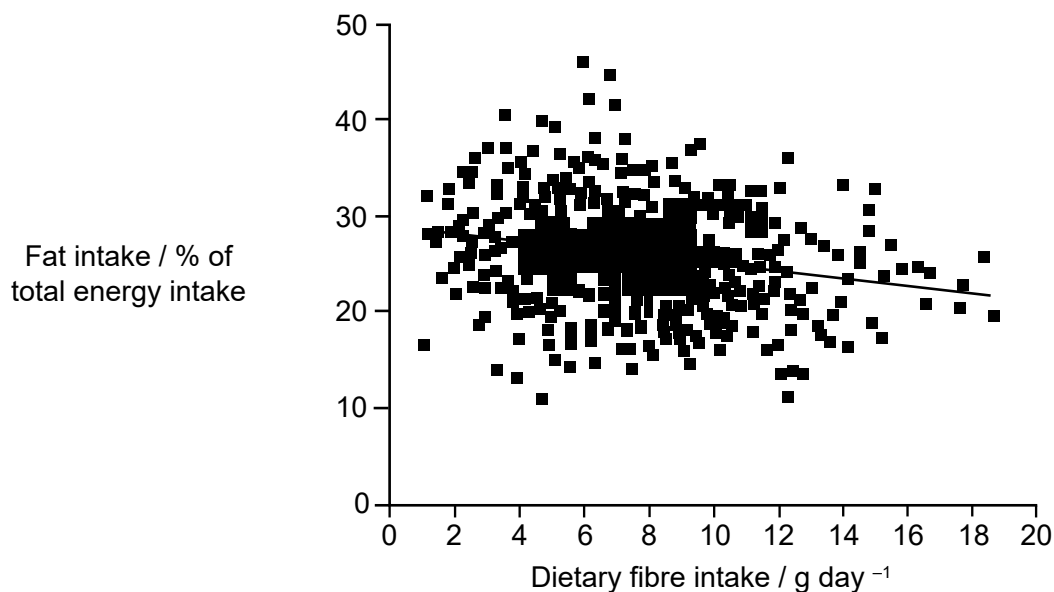
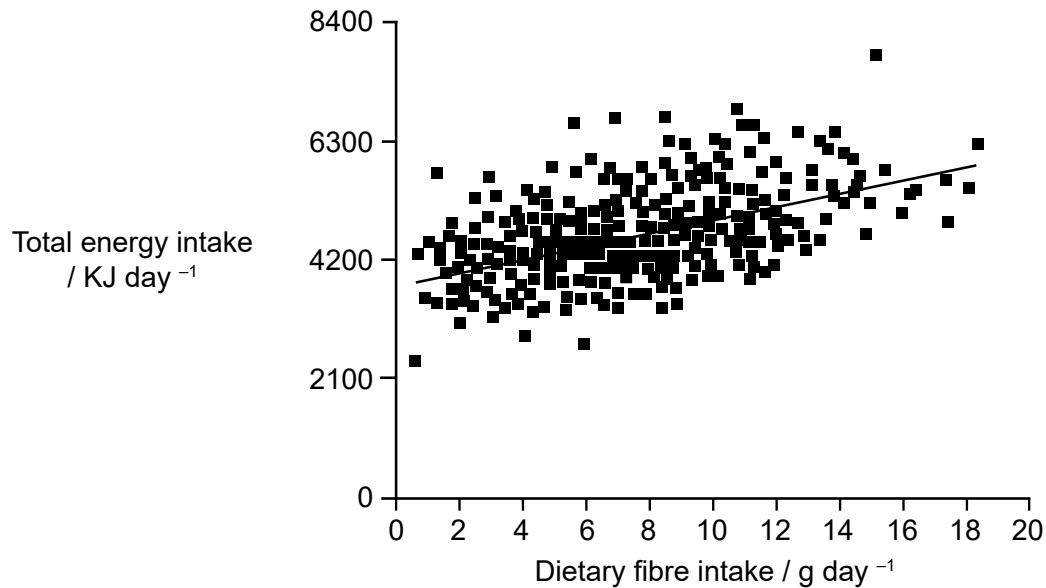
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(Question 1 continued)

The graphs show how the energy intake of the 13-month-old children varied with the daily intake of fibre and the percentage of this energy that came from fat.



[Source: adapted from Ruottinen, S., Lagström, H.K., Niinikoski, H., Rönnemaa, T., Saarinen, M., Pakkala, K.A., Hakanen, M., Viikari, J.S.A. and Simell, O., 2010. *The American Journal of Clinical Nutrition*, 91(3), pp.651–661. REDACTED.]

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(Question 1 continued)

- (e) Compare the effect of increasing daily dietary fibre intake on total energy intake and percentage of total energy from fat. [1]

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- (f) Fibre is known to have no energy value. Suggest a reason for the relationship between dietary fibre intake and total energy intake. [1]

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- (g) Discuss whether the study supports the hypothesis that high-fibre diets are healthy for children. [1]

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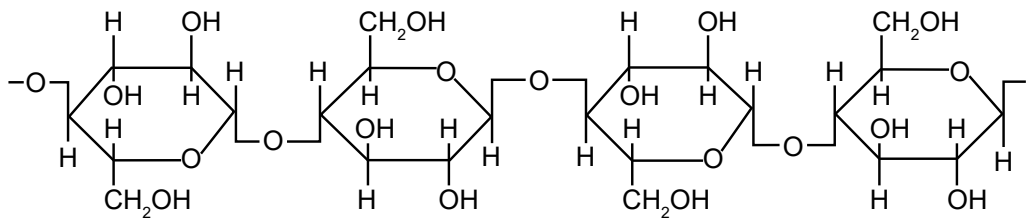
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Section A

Answer **all** questions. Answers must be written within the answer boxes provided.

4. The structure of part of a cellulose molecule is shown.



(a) Identify the monomer from which cellulose is composed. [1]

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(b) Explain how the structure of cellulose is related to its function. [3]

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