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BIOLOGY

FOUNDATIONS IN BIOLOGY

Level & Board	OCR (A-LEVEL)
TOPIC:	BIOLOGICAL MOLECULES - CARBOHYDRATES
PAPER TYPE:	QUESTION PAPER - 1
TOTAL QUESTIONS	8
TOTAL MARKS	/31

Biological Molecules – Carbohydrates - 1

1.

(a) The enzyme that breaks down sucrose is called sucrase. Which of the bonds (A to D) does sucrase break? **(1)**

A: Alpha glycosidic ☐

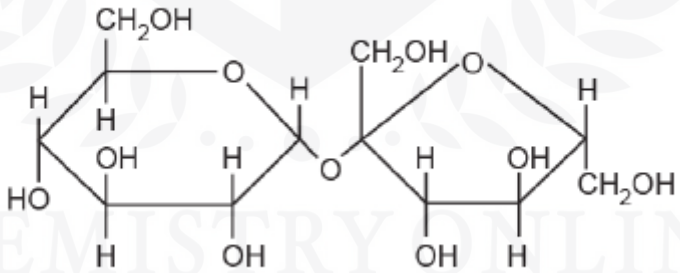
B: Beta glycosidic ☐

C: Ester ☐

D: Peptide ☐

2.

The disaccharide sucrose is the molecule below.



(a) Which of the rows, A through D, best illustrates the kind of reaction that takes place when sucrose breaks down and the monosaccharides that result from it? **(1)**

I am Sorry !!!!!

	Type of reaction	Monosaccharides	
A	condensation	α glucose	α glucose
B	condensation	α glucose	fructose
C	hydrolysis	α glucose	α glucose
D	hydrolysis	α glucose	fructose

3.

(a) Which of the following steps (A through D) best illustrates how cellulose is formed? **(1)**

A: Condensation polymerisation of amino acid molecules

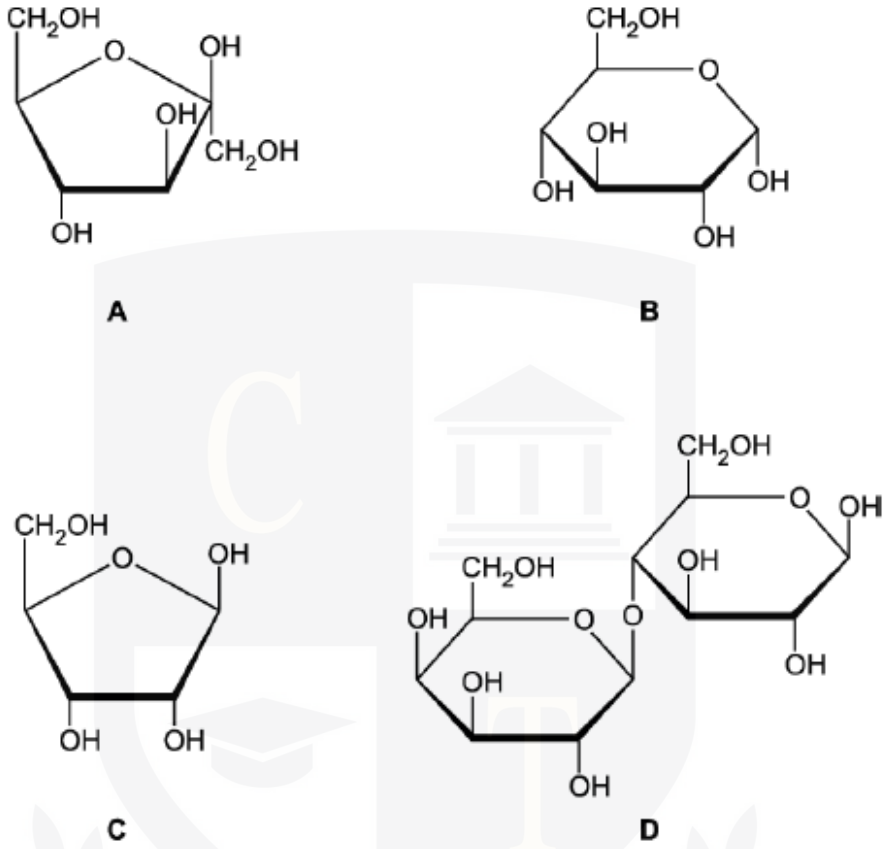
B: Condensation polymerisation of β-glucose molecules

C: Hydrolysis polymerisation of α-glucose molecules

D: Hydrolysis polymerisation of deoxyribose molecules

4.

(a) Of the molecules A through D, which one is a pentose sugar? **(1)**



5.

(a) Since most termites exclusively consume dead plant matter, cellulose serves as their main dietary supply. A polymer is cellulose.

Give the cellulose's monomer's name. **(2)**

(b) What is the structure of a carbohydrate? **(2)**

(c) What carbohydrate is found in DNA? **(2)**

6.

Important chemicals called polymers play both structural and functional roles in living things.

In insects, chitin is a polymer that plays a significant role in the exoskeleton's structure.

Chitin is a polysaccharide-like macromolecule made up of molecules of N-acetylglucosamine, whose structure is depicted in the figure below (Fig. 3.1).

• The chitin molecule is created when the monomers of N-acetylglucosamine link together via 1-4 glycosidic linkages.

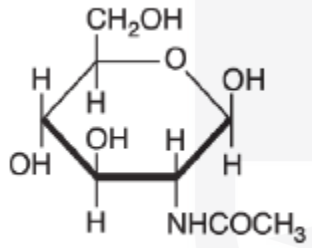


Fig. 3.1

(a) What distinguishes a monosaccharide sugar from N-acetylglucosamine in terms of composition? **(2)**

(b) Which monosaccharide sugar is the closest to N-acetylglucosamine? **(2)**

(c) Given your understanding of the assembly of structural polysaccharides, explain how the chitin molecule is formed from its monomer and provide a structural prediction. **(2)**

7.

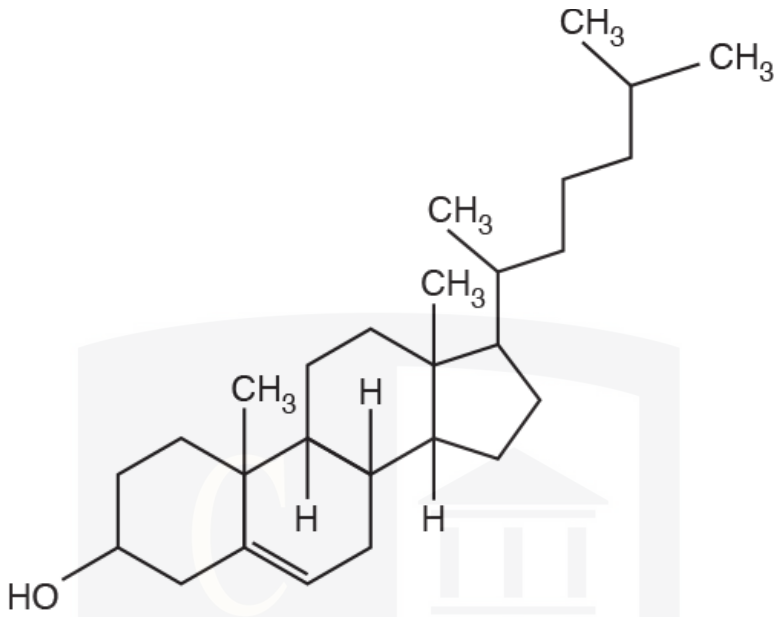
Carbohydrates and lipids are two forms of energy storage in living things.

(a) Identify the molecules of carbohydrates that plants and animals utilize to store energy. **(2)**

(b) Describe and explain how the various lipid and carbohydrate molecules' structures and characteristics fit them for their function as molecules that stores energy in plants and animals**. (9)**

8.

Both glucose and cholesterol are bloodstream chemicals that may require monitoring in individuals with various medical disorders. The structure of a cholesterol molecule is shown in Fig. 6.



(a) Indicate two instances in which the chemical structures of glucose and cholesterol are comparable**. (2)**

(b) An essential biological molecule for cellular respiration, glucose is needed by cells. Describe the physical characteristic of glucose that makes it simple for the bloodstream to carry it. **(2)**

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