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Level: HL IB in Biology

Subject: Biology

Topic: IB HL Biology

Type: Topic Question

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BIOLOGY

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Key skills



****Question 1****

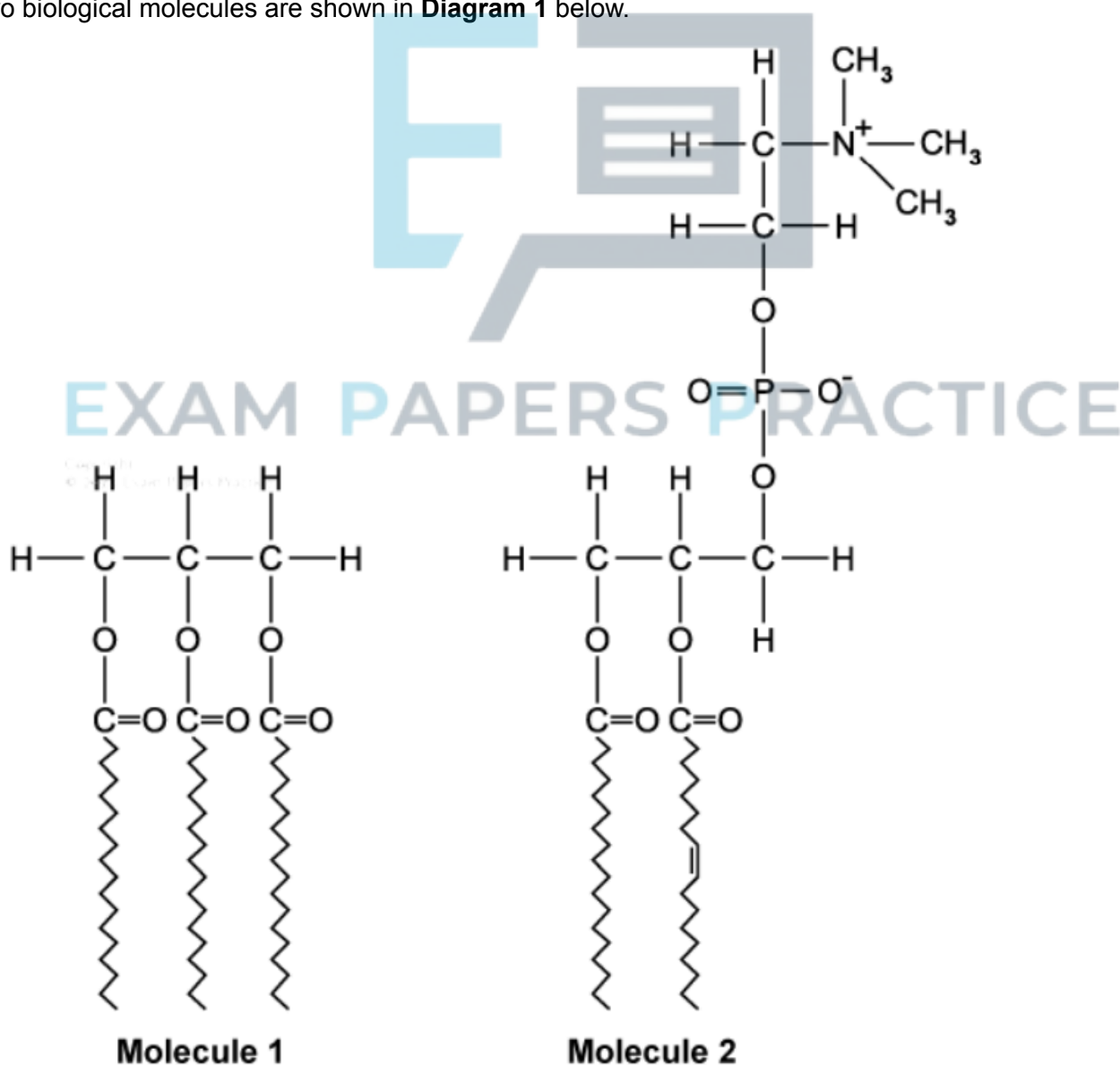
Which property of carbon makes it a good basis for organic molecules?

- A. It exists in hard and stable forms like graphite and diamond.
- B. It forms a varying number of covalent bonds to other atoms.
- C. It can form millions of different compounds in association with hydrogen and oxygen.
- D. It forms strong, ionic bonds with other atoms.

[1 mark]

****Question 2****

Two biological molecules are shown in **Diagram 1** below.



Which row of the table correctly identifies features of these molecules?

Molecule 1 | Molecule 2

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	Molecule 1	Molecule 2
A	Has 3 fatty acid chains	Fatty acid chains are all saturated
B	Contains 3 glycosidic bonds	Has 2 ester bonds and a phosphate group
C	Has 3 saturated fatty acid chains	Has 1 unsaturated fatty acid chain
D	Molecule is polar	Molecule is polar

[1 mark]

****Question 3****

The molecular structure of starch makes it suited to its function.

Which statement best explains why?

- A. Many condensation reactions, in the breakdown of amylose and amylopectin, release stored energy.
- B. Many hydrolysis reactions, in the formation of amylose and amylopectin, allow the release of stored energy to fuel cellular processes.
- C. Amylose has a branched structure, and amylopectin is coiled to give a compact structure for transport around the plant through the phloem.
- D. The amylose-amylopectin complex is insoluble, so it does not affect the osmolarity of the cell.

[1 mark]

****Question 4****

There is a naturally-occurring polysaccharide that has the structure of an unbranched chain of the molecule acetylglucosamine held together by β -1,4 glycosidic bonds. Between these unbranched chains are many types of weaker bonds.

There are $-\text{CH}_2\text{OH}$ groups that alternate on each side of the polysaccharide chain.

Which of the following polysaccharides has a structure similar to that described above?

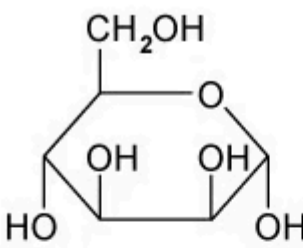
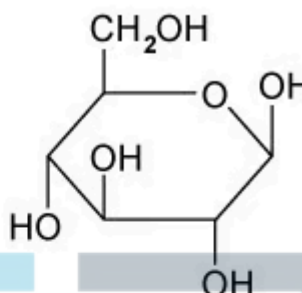
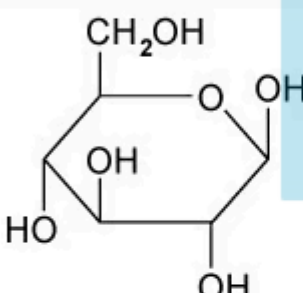
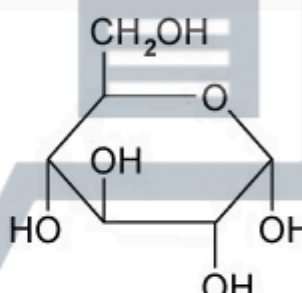
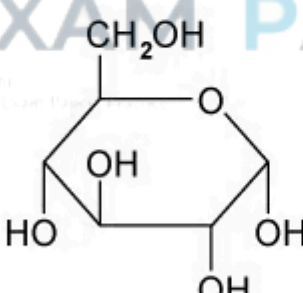
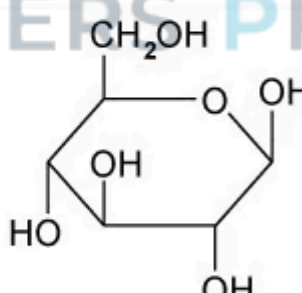
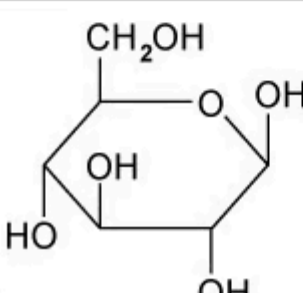
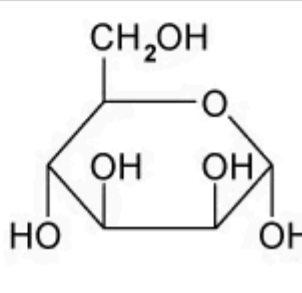
- A. Glycogen
- B. Cellulose
- C. Amylopectin
- D. Amylose

[1 mark]



****Question 5****

Which of the structures in **Diagram 2** correctly shows the structure of β -glucose and α -glucose?

	β -glucose	α -glucose
A		
B		
C		
D		

[1 mark]

****Question 6****

Which of the following statements correctly describes a feature of carbohydrates **OR** lipids?

- A. Glycosidic bonds form during hydrolysis reactions, joining monosaccharides together to form disaccharides and polysaccharides.
- B. A triglyceride is an example of a polymer as it is formed from many smaller, repeating subunits joined together by covalent bonds.
- C. A triglyceride is not an example of a polymer although it is formed from smaller subunits joined together.
- D. Glycosidic bonds join disaccharides together to form monosaccharides and polysaccharides.

[1 mark]

****Question 7****

Which of the following occurs when sucrose is formed from monosaccharides?

- A. Condensation of glucose and fructose, using water.
- B. Condensation of glucose and galactose, using water.
- C. Condensation of glucose and fructose, releasing water.
- D. Condensation of glucose and galactose, releasing water.

[1 mark]

****Question 8****

Apart from being used for energy storage, lipids have a number of other roles. Which of the following is not a role of whole lipids?

- A. Protection for soft internal organs.
- B. Buoyancy aid.
- C. Improving intestinal absorption of nutrients.
- D. Regulators of gene expression.

[1 mark]



****Question 9****

Which of the following chemical formulae shows a carbohydrate molecule?

- A. $C_{18}H_{34}O_2$
- B. $C_{18}H_{32}O_{16}$
- C. $C_{18}H_{32}O_2$
- D. $C_3H_8O_3$

[1 mark]

****Question 10****

Which is the correct reason that cellulose passes through the gut undigested?

- A. There are no enzymes present in the human digestive system capable of cellulose digestion.
- B. Cellulose is not a required nutrient of the human body.
- C. Cellulose provides bulk for effective peristalsis, which forces the food through the alimentary canal.
- D. It takes too long for the glucose monomers in cellulose to be hydrolysed, so cellulose is egested before it can be digested.

[1 mark]