

2.4 Water

Question Paper

Course	CIE A Level Biology (9700) exams from 2022
Section	2. Biological Molecules
Topic	2.4 Water
Difficulty	Hard

Time allowed: 10

Score: /4

Percentage: /100

Question 1

Which property of water is paired with an incorrect physiological use?

	property	use
A	forms hydrogen bonds between water molecules	dissolves metabolites within cells
B	is a polar molecule	dissolves ionic molecules required in signalling
C	has a high specific heat capacity	optimum enzymatic activity is maintained
D	has a high latent heat of vapourisation	enables heat loss through sweating

[1 mark]

Question 2

Sodium hydrogen carbonate (NaHCO_3) dissociates into sodium ions (Na^+) and bicarbonate ions (HCO_3^-) when it is dissolved. The latter creates an alkaline environment suitable for enzymes and bicarbonate ions in the blood help to buffer lactic acid during exercise.

How does water help the production of bicarbonate ions?

- A The oxygen atoms form ionic bonds with bicarbonate ions.
- B The oxygen atoms in water attract bicarbonate ions.
- C The hydrogen atoms form hydrogen bonds with bicarbonate ions.
- D The hydrogen atoms in water attract bicarbonate ions.

[1 mark]

Question 3

Which of the following does not rely on the specific heat capacity of water?

- A** heat loss through evaporation of sweat
- B** enzyme function
- C** aquatic ecosystems withstanding extreme temperature change
- D** humans living in sub-zero temperatures

[1 mark]

Question 4

Enzymes are soluble proteins that use their specific shape to catalyse biological reactions.

What is most likely to happen to the rate of reaction if an enzyme is dissolved in a non-polar solvent such as hexane (C_6H_{14})?

- A** The rate of reaction will stay the same.
- B** The rate of reaction will increase.
- C** The rate of reaction will decrease.
- D** The enzyme will precipitate out of solution.

[1 mark]