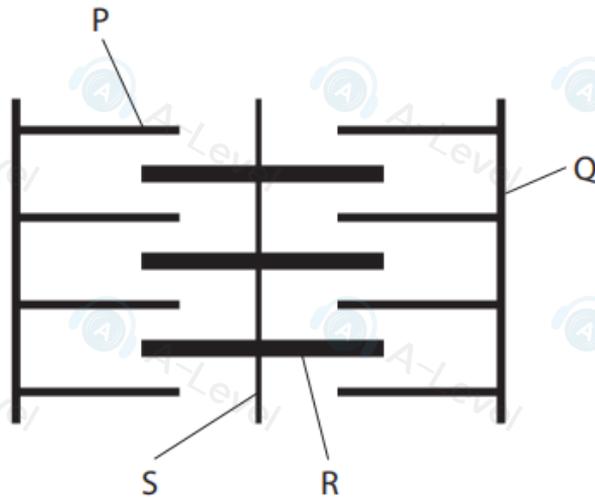


1 Muscles, tendons and the skeleton all interact when a human arm moves.

(a) The diagram below shows a sarcomere of a muscle.



Put a cross in the box that completes each statement about the sarcomere.

(i) Structure R contains

- A actin only
- B actin and tropomyosin
- C myosin only
- D myosin and tropomyosin

(1)

(ii) The structures that move when a sarcomere contracts are

- A P and Q
- B P and R
- C R and Q
- D R and S

(1)

(b) Describe the role of calcium ions in the sliding filament theory of muscle contraction.

(3)

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4 Water is an important molecule in living organisms.

(a) Water is a dipolar molecule that forms hydrogen bonds with other water molecules.

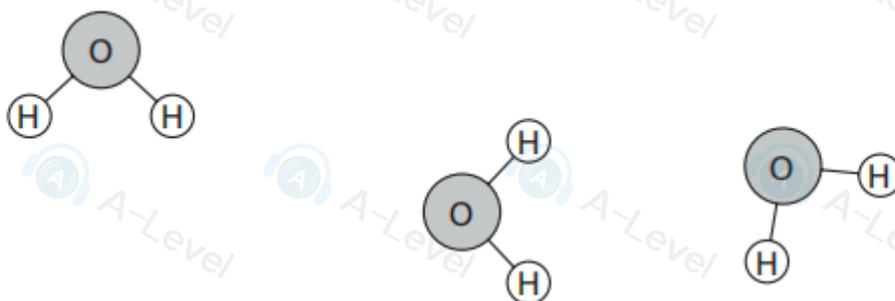
(i) Explain the dipole nature of water.

(2)

(ii) The diagram shows three water molecules.

Complete the diagram to show a hydrogen bond between two water molecules.

(1)



(b) Water plays a role as a solvent.

Sodium chloride dissolves in water.

The diagram shows a sodium ion (Na^+).

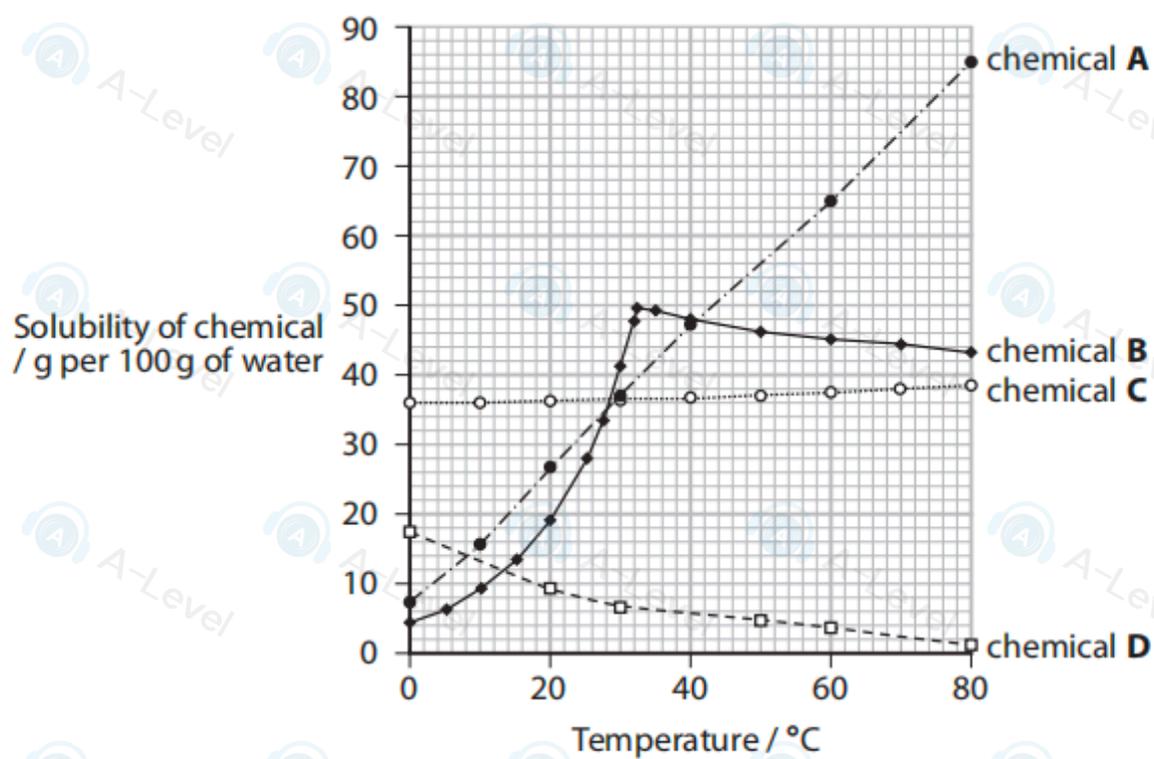
Complete the diagram to show the arrangement of two water molecules around a sodium ion when it is dissolved.

(1)



(c) Temperature affects the solubility of chemicals in water.

The graph shows the effect of temperature on the solubility of four chemicals, **A, B, C** and **D**.



Describe the effects of temperature on the solubility of these chemicals.

(4)

Handwriting practice lines consisting of five sets of three horizontal dashed lines each, providing space for the student's answer.

(Total for Question 4 = 8 marks)