10 **(a)** Nerve impulses can be transmitted along a myelinated motor neurone to a neuromuscular junction at fast speeds of up to $100\,m\,s^{-1}$.

Outline how a transmission speed of $100\,m\,s^{-1}$ is achieved by the neurone.

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..... [3]

(b) When a nerve impulse reaches the neuromuscular junction, acetylcholine is released and diffuses to the sarcolemma.

Describe how the release of acetylcholine can result in the binding of calcium ions to troponin in the sarcomere.

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(c) Muscle contraction can be affected by a low blood glucose concentration.

Suggest how a low blood glucose concentration would affect the functioning of the sarcomere.

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[Total: 10]