

GCSE Biology A (Gateway)

J247/03 B1-B3 and B7 Higher (Higher Tier)

Question Set 4

1

A boy picks up a hot plate and quickly drops it.

This is a reflex action.

- (a) Describe the sequence of events that happens in his nervous system during this reflex action.

The stimulus is first detected by receptors on the skin. The impulse sent along the sensory neurone to the spinal cord. The impulse is then sent along a motor neurone to the hand/arm muscles to drop the plate. [5]

- (b) The table shows information about different types of neurones.

Type of neurone	Is myelin sheath present?	Diameter ($\times 10^{-3}$ mm)	Speed of impulse (m/s)
A	yes	13–20	80–120
B	yes	6–12	33–75
C	yes	5–8	4–24
D	yes	1–5	3–15
E	no	0.2–1.5	0.5–20

- (i) Discuss the effect of diameter on the speed of impulse.

As diameter increases so does speed of impulse but there are exceptions - Eg. all speeds for B are greater than for C even though the diameters overlap. [2]

- (ii) Explain how strong a conclusion, if any, you can make from the data about the effect of the myelin sheath on the speed of impulse.

Cannot make a valid conclusion. Although D has the lowest speeds it also has the smallest diameter and the results might be due to this. [2]

Total Marks for Question Set 4: 9

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