

Neurones and reflexes: practice questions

7 questions · 19 marks · mark scheme at the back

For Edexcel GCSE Biology 1BI0 and Combined Science 1SC0. **Triple only** is not in Combined Science. **Higher tier** is only on the Higher paper.

Name

Total / 19

1 What is the function of the myelin sheath around a neurone? [1 mark]

- A. ☐ To release neurotransmitter
- B. ☐ To speed up the transmission of impulses
- C. ☐ To detect a stimulus
- D. ☐ To join two neurones together

2 Describe how an impulse is passed from one neurone to the next at a synapse. [3 marks]

3 The flow chart shows a reflex arc: stimulus → receptor → neurone X → neurone Y → neurone Z → effector → response. Name neurones X, Y and Z. [3 marks]

Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1]

B B (1)

2. [3]

- neurotransmitter is released (from the first neurone) into the synapse / gap (1)
- the neurotransmitter diffuses across the gap (1)
- it binds to receptors on the next neurone, which triggers a new electrical impulse (1)

3. [3]

- X: sensory neurone (1)
- Y: relay neurone (1)
- Z: motor neurone (1)

4. [2]

- $18 + 16 + 15 + 13 + 11 = 73$ and $73 \div 5$ (1)
- 14.6 cm (1) correct answer with no working scores 2

5. [2]

- negative correlation / distance decreases as the number of attempts increases (1)
- practice makes the reaction time shorter / the response quicker (1)

6. [2]

- it is fast / rapid / automatic / does not involve conscious thought (1)
- so the body responds before (more) damage is done / reduces injury (1)

7. [6]

Level 3 5-6	Describes the whole pathway in order, naming receptor, sensory, relay and motor neurones and effector. Explains how synapses transmit the impulse with neurotransmitters and links structure (such as myelin sheath or axon) to function. Scientific terms are used accurately.
Level 2 3-4	Describes most of the pathway in order with the types of neurone named, and mentions synapses or neurotransmitters. Links between structure and function may be missing.
Level 1 1-2	Gives isolated points about neurones or the response, with little order or explanation.

Indicative content

- receptors in the skin detect the stimulus (heat or pain) and produce electrical impulses
- sensory neurone carries the impulses to the CNS
- synapse between the sensory neurone and the relay neurone: neurotransmitter is released, diffuses across the gap and triggers an impulse
- relay neurone in the spinal cord passes the impulses to the motor neurone
- motor neurone carries the impulses to the effector (a muscle in the arm)
- the muscle contracts and the hand is pulled away
- the myelin sheath insulates the neurones and speeds up the transmission of impulses
- the long axon carries impulses over long distances
- the reflex is fast and automatic because it does not involve conscious thought