

The human nervous system: practice questions

9 questions • 25 marks • mark scheme at the back

For AQA GCSE Biology 8461 and Combined Science: Trilogy 8464. **Triple only** is not in Combined Science. **Higher tier** is only on the Higher paper.

Name

Total / 25

- 1** A person touches a hot object and their hand moves away without them thinking. [3 marks]
Describe the path taken by the nerve impulse in this reflex action.

- 2** A student measured her reaction time five times using a computer test. The results were [2 marks]
0.26 s, 0.24 s, 0.31 s, 0.27 s and 0.28 s. Calculate her mean reaction time.

Answer =

- 3** Describe how you could investigate the effect of a distraction, such as music, on a [4 marks]
person's reaction time using a ruler.

4

Triple only

[3 marks]

The cerebral cortex, the cerebellum and the medulla are regions of the brain. Describe one function of each region.

5

Triple only

Higher tier

[2 marks]

Explain why it is difficult to investigate brain function and to treat brain disorders.

6

Triple only

[1 mark]

A person walks from a bright room into a dim room. What happens in their eye so that they can see better?

- A. ☐ The ciliary muscles contract
- B. ☐ The pupil becomes wider
- C. ☐ The lens becomes thinner
- D. ☐ The pupil becomes narrower

7

Triple only

[3 marks]

Explain how the eye focuses on a near object.

8

Triple only

[3 marks]

A person with myopia (short sightedness) cannot see distant objects clearly. Explain how a spectacle lens can correct this.

9

Triple only

Higher tier

[4 marks]

A person walks outside on a very cold day and their body temperature begins to fall.
Explain how their body responses raise body temperature.

Mark scheme

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

1. [3]

- impulse travels along the sensory neurone (from the receptor) to the CNS / spinal cord (1)
- impulse crosses a synapse to the relay neurone (1)
- impulse passes (across another synapse) to the motor neurone (1)
- motor neurone carries the impulse to the effector / muscle, which contracts (1)
- Max 3

2. [2]

- $0.26 + 0.24 + 0.31 + 0.27 + 0.28 = 1.36$ (1)
- $1.36 \div 5 = 0.27 \text{ s}$ (1) allow 0.272 s
- allow 1 mark for dividing their total by 5 if the addition is wrong

3. [4]

- partner holds ruler vertically and drops it without warning; the person catches it and the distance is read from the ruler (1)
- repeat with and without the distraction (1)
- control variables stated, such as the same person, the same hand and the same drop height (1)
- repeat several times and calculate a mean (for each condition) (1)
- allow: a shorter distance means a faster reaction

4. [3] Triple only

- cerebral cortex: consciousness / intelligence / memory / language (1)
- cerebellum: coordinates muscular activity / balance (1)
- medulla: controls unconscious activities, such as heart rate or breathing (1)

5. [2] Triple only Higher tier

- the brain is very complex / made of billions of interconnected neurones with different regions (1)
- the brain is delicate, so investigation or treatment can damage it (1)

6. [1] Triple only

B B: the iris makes the pupil wider so more light enters the eye (1)

7. [3] Triple only

- ciliary muscles contract (1)
- suspensory ligaments loosen (1)
- lens becomes thicker (1)
- so refracts the light rays more strongly / light focuses on the retina (1)
- Max 3

8. [3] Triple only

- in myopia, light rays from distant objects focus in front of the retina (1)
- a concave lens is used (1)
- it refracts / spreads the light rays so that they focus on the retina (1)

9. [4] Triple only Higher tier

- blood vessels constrict / vasoconstriction (1)
- so less blood flows near the skin surface and less energy is transferred to the surroundings (1)
- sweating stops, so less energy is transferred by evaporation (1)
- skeletal muscles contract rapidly / shiver (1)
- respiration in the muscles releases energy, which warms the body (1)
- Max 4