

## Mark schemes

**Q1.**

(a) (stimulus) → receptor → coordinator → effector → (response)

allow receptor → coordinator for **1** mark

allow coordinator → effector for **1** mark

2

(b) any **two** from:

- fast / rapid
- a response / reaction  
*ignore action*
- automatic / involuntary  
**or**  
not under conscious control  
*allow not coordinated by the conscious part of the brain*  
**or**  
*allow does not involve thought / thinking*  
*ignore not coordinated by the brain*
- protects (from danger / harm)

2

(c) blinking in sudden bright light

1

(d) muscle

1

(e) B

1

(f) A

1

(g) balance

1

**[9]**

**Q2.**

- (a) (A) optic nerve 1
- (B) lens 1
- (b) contract 1
- (c) thicker 1
- (d) iris 1
- (e) any **one** from:
- (sent as) impulses  
allow *(sent as) electrical signals*  
ignore *messages*
  - along sensory neurone(s) 1
- (f) the light rays do not meet / focus / converge on the retina  
allow *the light rays meet / focus / converge before the retina*  
allow *the light rays do not meet / focus / converge at the back of the eye*  
allow *lens is too thick*  
allow *eyeball is too long* 1
- (g) any **one** from:
- (hard / soft) contact lenses
  - (laser) surgery
  - replacement lens (in the eye)  
ignore *spectacles / glasses* 1

**[8]**

**Q3.**

- |     |   |     |
|-----|---|-----|
| (a) | accommodation   | 1   |
| (b) | B   | 1   |
| (c) | E   | 1   |
| (d) | becomes fatter / thicker / wider<br><i>allow more convex / curved / rounded</i><br><i>ignore larger / smaller</i>   | 1   |
| (e) | any <b>two</b> from: <ul style="list-style-type: none"> <li>• (muscles in the iris) contract<br/><i>allow (muscles in the iris) shorten</i><br/><i>ignore circular / radial muscles</i><br/><i>ignore (muscles in the iris) relax</i><br/><i>do <b>not</b> accept ciliary muscles contract</i></li> <li>• reduce size of pupil<br/><i>allow constrict pupil</i><br/><i>allow reduce size of aperture / gap / hole</i></li> <li>• reduces (amount of) light entering<br/><i>allow reduces (amount of) light reaching retina</i></li> </ul> | 2   |
| (f) | <b>Level 2:</b> The method would lead to the production of a valid outcome. The key steps are identified and logically sequenced.   | 3–4 |
|     | <b>Level 1:</b> The method would not necessarily lead to a valid outcome. Most steps are identified, but the method is not fully logically sequenced.   | 1–2 |
|     | <b>No relevant content</b>  | 0   |

**Indicative content**

- identification of method eg ruler drop
- correct details of method chosen eg hold ruler above thumb
- repetitions – at least two more times
- repeat with (at least 2 more) other students
  
- tested without coffee **and** with coffee **or** with different amounts of coffee
- calculate mean value with coffee and without coffee
- compare results with and without coffee
  
- correct control variables for method chosen, eg:
  - o same age
  - o sex
  - o BMI
  - o amount of sleep
  - o volume / concentration / type of coffee
  - o time interval between drinking and testing
  - o control variable within method described

For **Level 2** reference to collecting results with and without coffee along with how the investigation is designed to create valid results is required

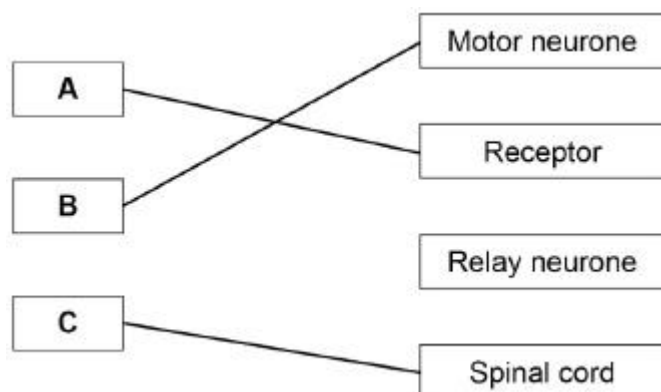
**[10]**

**Q4.**

- (a) a reflex action is automatic

1

- (b)



do **not** accept more than one line from a box on the left

3

- (c) blinking when an insect flies into the eye

1

removing the hand from a hot object

1

- (d) View with the table  
Mark with (e)

$$\frac{(320 + 304 + 315 + 308 + 313)}{5}$$

$$\text{allow } \frac{1560}{5}$$

1

312

$$\text{if no other mark awarded allow 1 mark for } \frac{315 + 307 + 357}{3} = 326(.3)$$

1

- (e) View with the table  
Mark with (d)

ring drawn around 635 in the table

allow 635 or test 5 (next to question) if no ring drawn on the table

1

- (f) any **two** from:
- age
  - drugs
    - allow a named example of a drug such as alcohol / caffeine*
  - tiredness / sleep
  - sex
    - allow gender*
    - allow practice at the test **or** playing computer games*
    - allow distractions*

2

**[11]**

**Q5.**

- (a) (lowest) 1 (°C)  
*allow a tolerance of  $\pm 0.2$  (°C)*  
 (highest) 34 (°C)  
*allow a tolerance of  $\pm 0.2$  (°C)*  
*both correct for 1 mark* 1
- (b) 5 / five 1
- (c) so stored food **or** glycogen does not run out  
**or**  
 to replace stored food **or** glycogen  
*allow so stored fat does not run out*  
*or to replace stored fat*  
*or because stored food or glycogen / fat has run out*  
*ignore to provide energy* 1
- (d) respiration 1
- (e) any **one** from:  
 • movement  
*allow functioning of internal organs – eg heartbeat*  
 • muscle contraction  
 • keeping warm  
 • growth / repair  
*allow synthesis / described*  
 • active transport 1
- (f)  $3200 \times 2.5$  1  
 8000 (kJ) 1
- (g)  $\frac{6000}{24\,000} \times 100$  1  
 25 (%)  
*if no other mark awarded allow for 1 mark 0.25* 1

(h) reduced

*do **not** accept no sweating*

1

**[10]**