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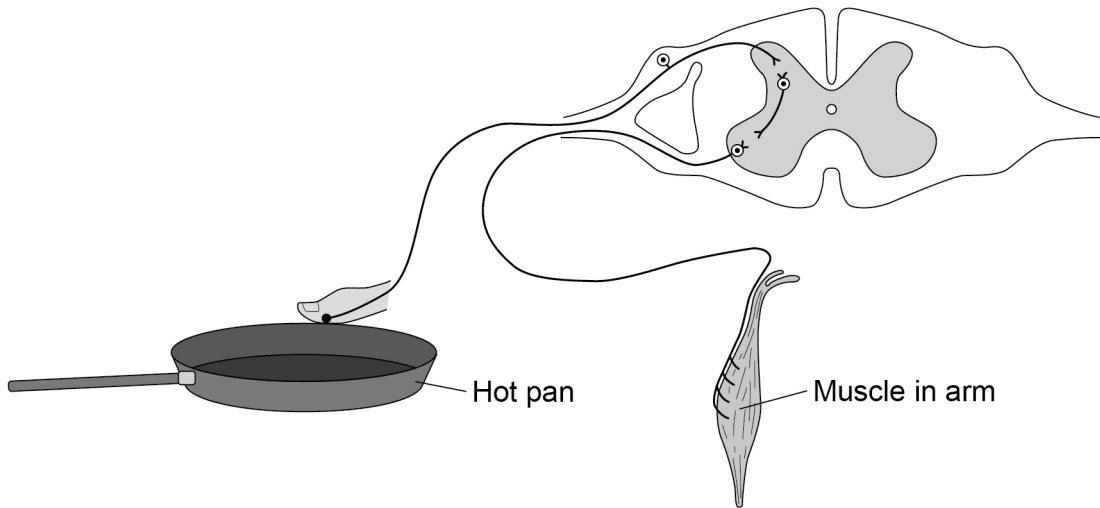
Human reactions are a response to an external change.

0 7 . 1

Reflex actions help to protect the body against damage.

Figure 8 shows the nervous pathway for a reflex action.

Figure 8



A stimulus from the hot pan will cause the muscle in the arm to contract and move the finger away.

Describe how the stimulus from the hot pan reaches the muscle in the arm.

[4 marks]



A different student carried out an investigation to see if playing tennis improved reaction time.

The student used two groups of six people.

Table 2 shows the results.

Table 2

Person	Reaction time in seconds	
	People who play tennis	People who do not play tennis
1	0.2	0.3
2	0.4	0.4
3	0.3	0.6
4	0.4	0.5
5	0.2	0.3
6	0.3	0.2
Mean	X	0.4

0 7 . 3 Calculate mean value **X** in **Table 2**.

[2 marks]

X = _____ seconds

0 7 . 4 What is the dependent variable in the student's investigation?

[1 mark]



The student concluded:

'Playing tennis improves reaction time.'

0 7 . 5

Give **one** piece of evidence which supports the conclusion.

[1 mark]

0 7 . 6

Give **one** piece of evidence which does **not** support the conclusion.

[1 mark]

13

END OF QUESTIONS



Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1	any four from: <ul style="list-style-type: none"> • (stimulus is) detected by the receptor • (initiates) an electrical impulse • (impulse) travels via the neurones • sensory, relay and motor • crosses synapses • (crosses synapses) as a chemical 	allow in this order only	4	AO1 AO2 4.5.2
07.2	<p>Level 2: The method would lead to the production of a valid outcome. All key steps are identified and logically sequenced.</p> <p>Level 1: The method would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear.</p> <p>No relevant content</p> <p>Indicative content</p> <ul style="list-style-type: none"> • select at least 3 people • do reaction time test at least 3 times using right hand • details on how to do test in valid manner • find a mean • remove anomalous readings • repeat for each person for left hand • select people of same age • select people of same gender • same time of day • other control such as amount of coffee, sleep. <p>To access level 2 the right hand and left hand of each person must be compared</p>		3–4 1–2 0	AO2 AO1 4.5.2 RPA 6
07.3	$\frac{(0.2 + 0.4 + 0.3 + 0.4 + 0.2 + 0.3)}{6}$ <p>or</p> $\frac{1.8}{6}$ <p>0.3</p>		1 1	AO2 4.5.2 RPA 6

07.4	reaction time	allow time	1	AO2 4.5.2 RPA 6
07.5	students who play tennis (regularly) had shorter / faster (mean) reaction time(s)		1	AO3 4.5.2 RPA 6
07.6	any one from: <ul style="list-style-type: none"> • overlap in times between two groups • small difference in (mean) times • small sample used 	allow correctly described as comparative data allow students who did not play tennis may have played other (ball) games	1	AO3 4.5.2 RPA 6
Total			13	