

Q1.

Humans use the nervous system to react to changes in the environment.

- (a) (i) Which word means a change in the environment?

Draw a ring around the correct answer.

neurone

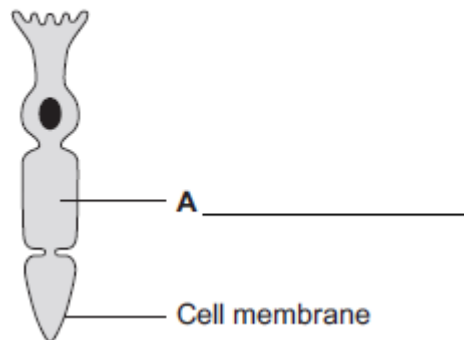
reflex

stimulus

(1)

- (ii) **Figure 1** shows a light receptor cell.

Figure 1



Use the correct answer from the box to label part **A** on **Figure 1**.

chloroplast

cytoplasm

vacuole

(1)

- (b) **Figure 2** shows a boy riding a bicycle on a sunny day.

Figure 2



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- (i) Receptors in the boy's body detect changes in the environment.

Complete the table to show which organ of the body contains the receptors for each change in the environment.

Change in the environment	Organ that contains the receptors
Sound of traffic from behind him	
Flashing blue lights of a police car	
Cooler air temperature in the shadows	

(3)

(ii) The boy's response to danger is to pull on the bicycle brakes.

Which type of effector causes this response?

Tick (✓) **one** box.

A gland

A muscle

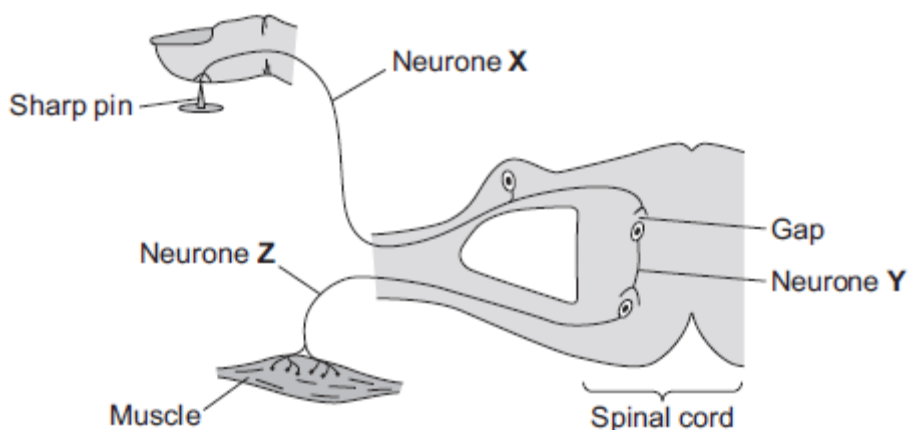
A synapse

(1)

(Total 6 marks)

Q2.

The diagram below shows the pathway for a simple reflex action.



(a) What type of neurone is neurone X?

Draw a ring around the correct answer.

motor neurone

relay neurone

sensory neurone

(1)

(b) There is a gap between neurone **X** and neurone **Y**.

(i) What word is used to describe a gap between two neurones?

Draw a ring around the correct answer.

effector

receptor

synapse

(1)

(ii) Draw a ring around the correct answer to complete the sentence.

Information passes across the gap as

a chemical. an electrical impulse. pressure.
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(1)

(c) Describe what happens to the muscle when it receives an impulse from neurone **Z**.
How does this reflex action help the body?

What happens to the muscle _____

How this helps the body _____

(2)

(Total 5 marks)

Q3.

Many human actions are reflexes.

(a) Which **two** of the following are examples of reflex actions?

Tick **two** boxes.

Jumping in the air to catch a ball

Raising a hand to protect the eyes in bright light

Releasing saliva when food enters the mouth

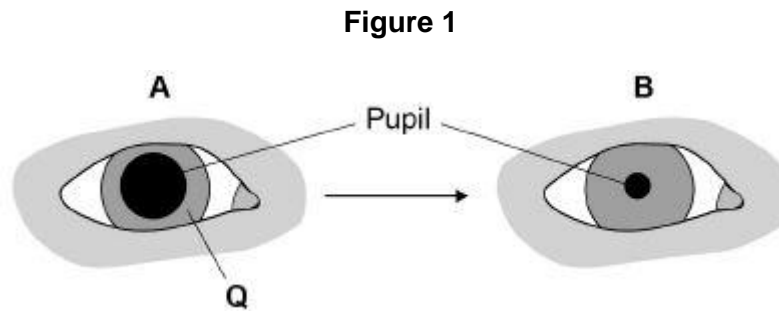
Running away from danger

Withdrawing the hand from a sharp object



(2)

Figure 1 shows how the size of the pupil of the human eye can change by reflex action.



(b) Name **one** stimulus that would cause the pupil to change in size from **A** to **B**, as shown in **Figure 1**.

(1)

(c) Structure **Q** causes the change in size of the pupil.

Name structure **Q**.

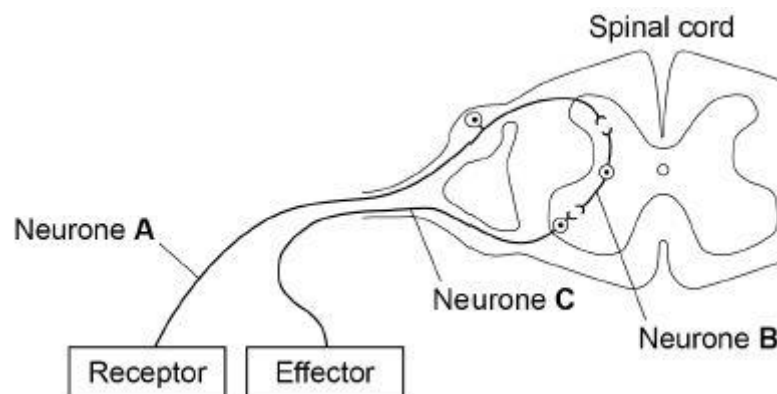
(1)

(d) Describe how structure **Q** causes the change in the size of the pupil from **A** to **B**.

(1)

(e) **Figure 2** shows some structures involved in the coordination of a reflex action.

Figure 2



Describe how the structures shown in **Figure 2** help to coordinate a reflex action.

(1)

- (b) Describe how information passes from the relay neurone to neurone X. Use the diagram to help you.

(3)

- (c) Scientists investigated the effect of two toxins on the way in which information passes across synapses. The table below shows the results.

Toxin	Effect at the synapse
Curare	Decreases the effect of the chemical on neurone X
Strychnine	Increases the amount of the chemical made in the relay neurone

Describe the effect of each of the toxins on the response by muscles.

Curare _____

Strychnine _____

(2)

(Total 6 marks)

