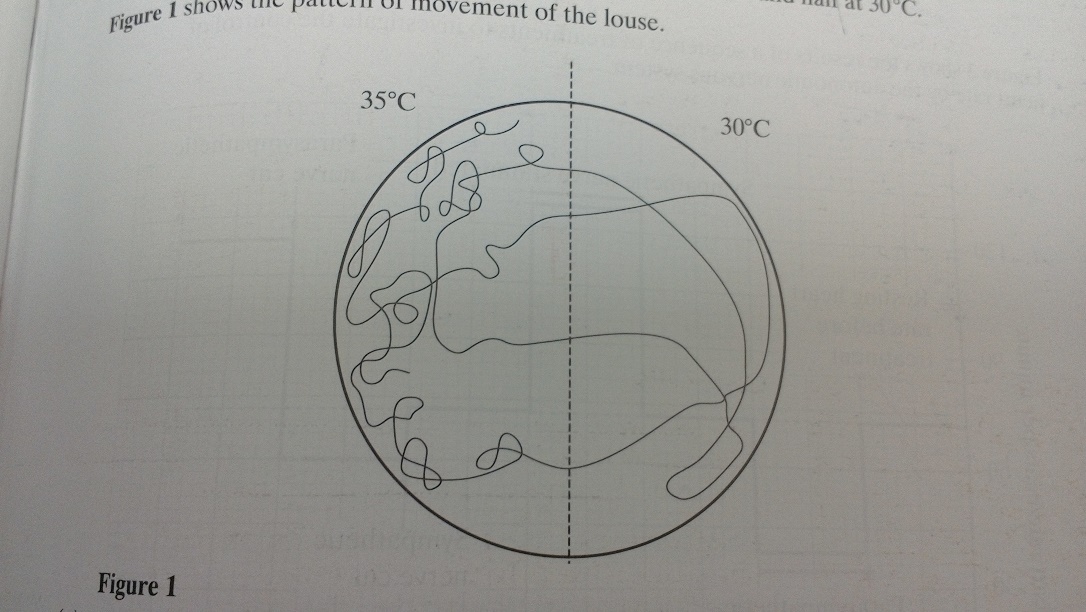
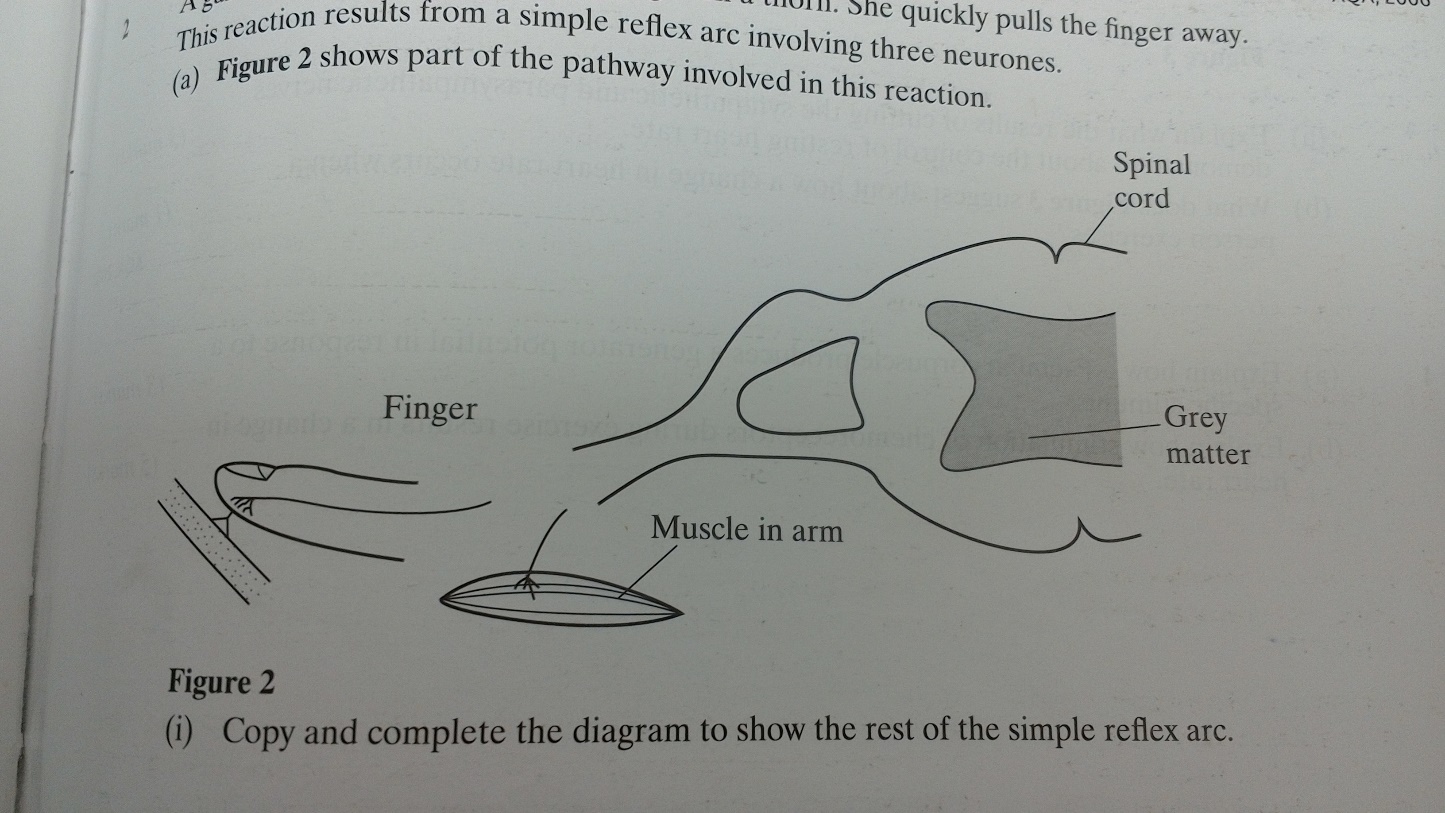
**RESPONSE TO STIMULI – end of topic questions**

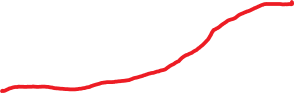
1. **The human body-louse is an insect which lives and feeds on the surface of the skin. A louse was placed on a chamber, half of which was kept at 35C and half at 30C. the diagram shows the pattern of movement of the louse.**
2. **Name the type of behavioural response shown by the body-louse in this investigation.**

Kinesis (or thermokinesis) as it is showing random movements and it involves a non-directional stimulus and response.

1. **Suggest and explain an advantage of this behaviour to the human body-louse.**

It stays longer in warmer areas (35C) and tends to leave cooler areas so that it will stay in favourable conditions and remain near food source (on the host)

1. **A gardener accidentally prinks her finger on a thorn. She quickly pulls the finger away. This reaction results from a simple reflex arc involving three neurones**
2. **The diagram shows part of the pathway involved in this reaction**



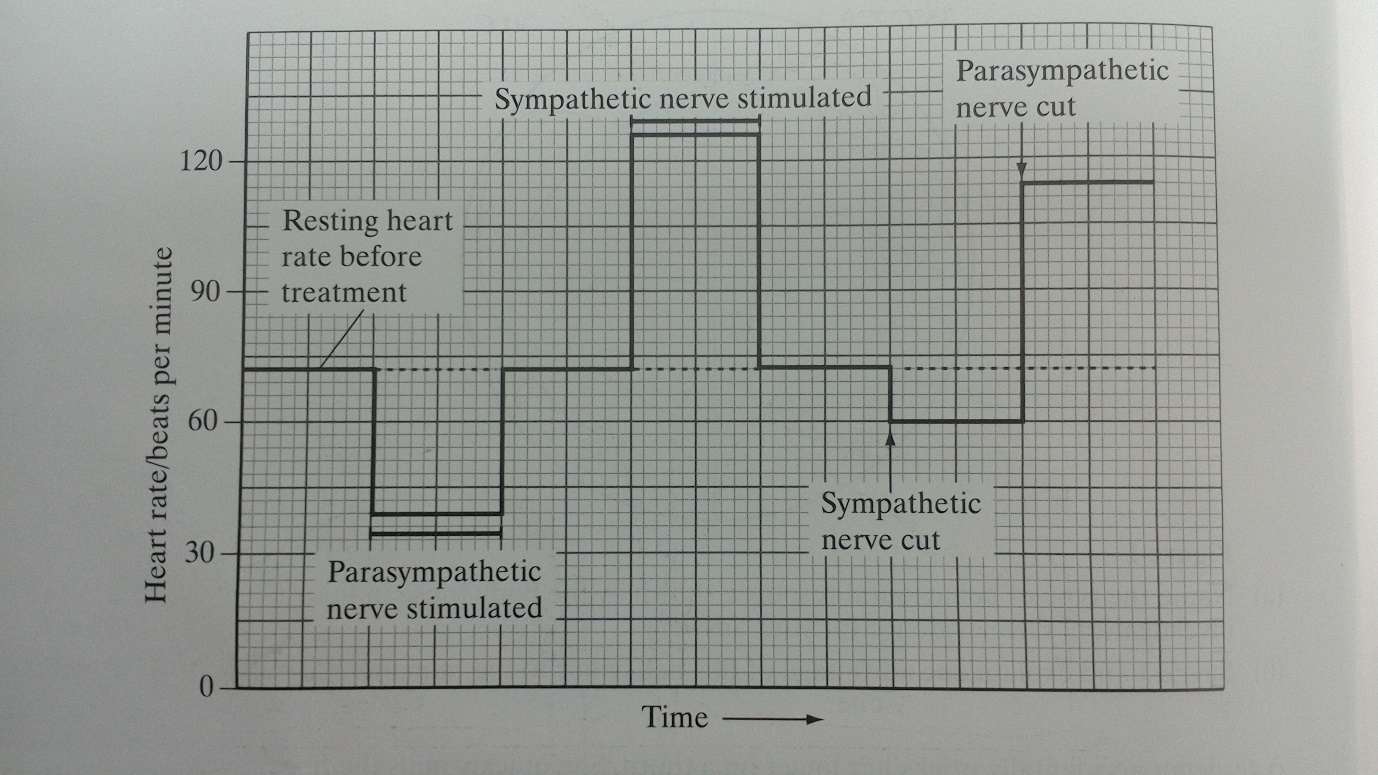
1. **Complete the diagram to show the rest of the reflex arc. Label the 3 neurones and the effector**
2. **(i) what is a reflex?**

A rapid response to a stimulus which is automatic/involuntary

1. **Explain the important of reflex actions**

It avoids damage to tissues by helping an organism survive by responding to its environment. It has a role in homeostasis, posture, balance, escaping predators, finding food and mating.

1. **The graph shows the results of a sequence of treatments to investigate the control of heart rate by the autonomic nervous system**

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1. **Explain what the results of cutting the sympathetic and parasympathetic nerves demonstrate about the control of resting heart rate**

heart rate controlled by both divisions. The parasympathetic reduces heart rate and the sympathetic increases heart rate. parasympathetic is most active so there will be a larger change in heart rate when parasympathetic is cut;

1. **What does the graph suggest about how a change in heart rate occurs when a person exercises?**

Heart rate increased by sympathetic and decreased by parasympathetic and there is a change in activity of both

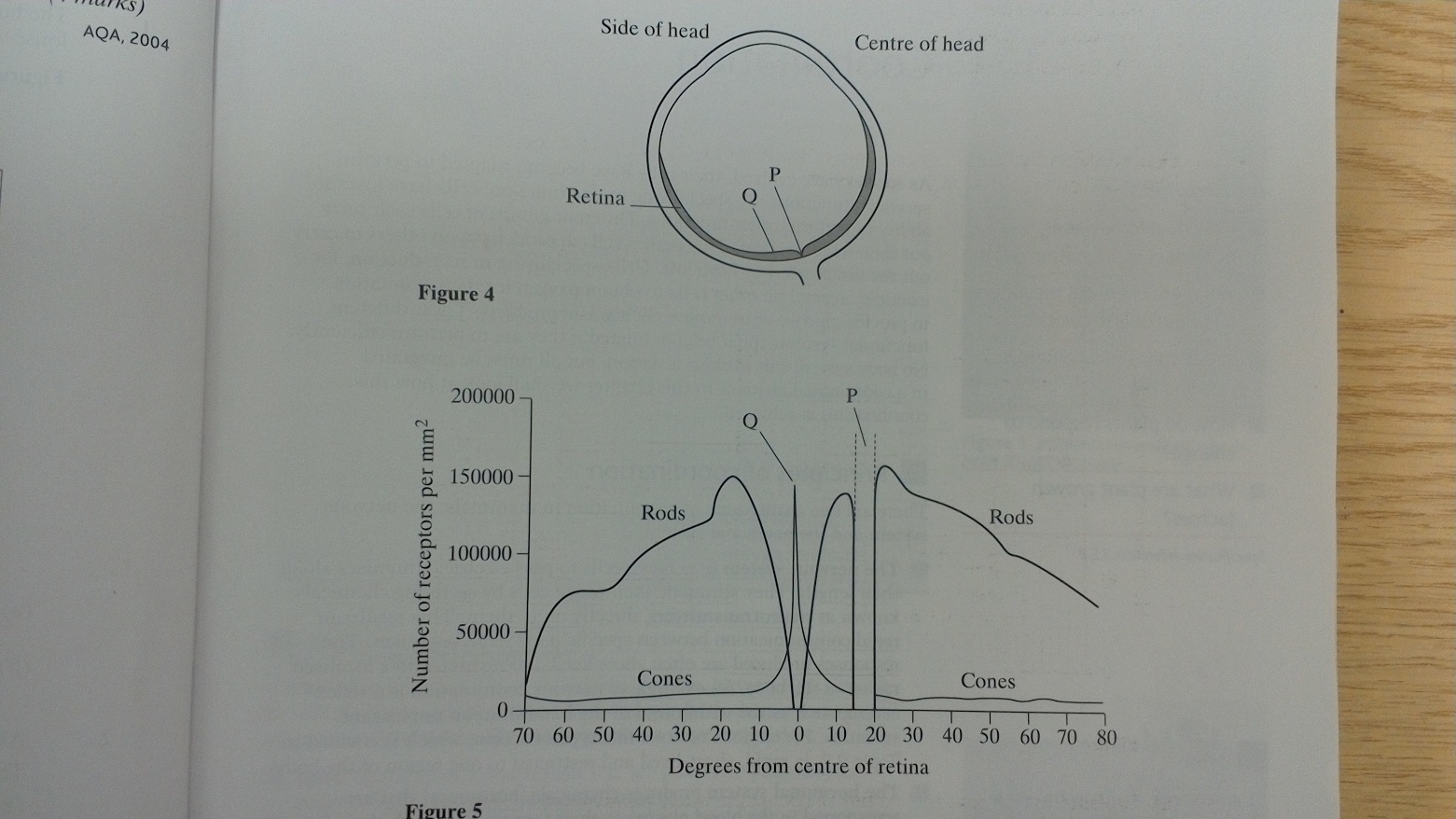
1. **(a) explain how a Pacinian corpuscle produces a generator potential in response to a specific stimulus**

pressure deforms and stretches the membrane of sodium ion channels so that their gates open and sodium ions can enter, causing depolarisation (change in membrane potential)

**(b) explain how stimulation of chemoreceptors during exercise results in a change in heart rate.**

increase in carbon dioxide from respiration causes a decrease in blood pH as detected by chemoreceptors in carotid, aortic bodies and the medulla. More impulses are sent to the cardiac centre / medulla and more of these impulses travel along the sympathetic nerve to SAN increasing heart rate.

1. **The diagram shows a section through a human eye. The graph shows the distribution of rods and cones in the retina of the human eye**

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1. **Use the diagram and graph to explain why;**
2. **No image is perceived when rays of light strike the retina at the point marked P**

It is the blind spot, no rods or cone cells are at point P

1. **Most details is perceived when rays of light strike the part of the retina labelled Q**

The maximum number of cones is at Q and each cone has a connection with one bipolar cell so the brain will receive separate sets of impulses from each stimulated cone.

1. **Rod cells allow us to see objects in dim light. Explain how the connections of rod cells to neurones in the retina make this possible.**

Several rods have connections with one bipolar cell so the summation of generator potential exceeds the threshold whereas individual generator potentials would not exceed this.