

The Nervous System and The Eye → What You Need to know:

Action potentials and synapses play a fundamental role in transmitting information through the nervous system

- The structure of a **myelinated motor neurone**.
- The role of the neurone membrane in the establishment of a **resting potential**.
- Explained in terms of **electrochemical gradients** and the movement of sodium and potassium ions.
- Change in membrane permeability leading to the generation of an **action potential**.
- The **all-or-nothing nature** of nerve impulses.
- Refractory period.
- Saltatory conduction.
- Factors affecting the **speed of conductance**: myelination, axon diameter and temperature.

Receptors convert stimuli into electrical impulses in nerve cells

- The basic structure of a **Pacinian corpuscle** as an example of a receptor.
- The creation of a **generator potential** on stimulation.
- The Pacinian corpuscle should be used as an example to illustrate the following:
 - receptors only respond to specific stimuli;
 - stimulation of receptor membranes produces deformation of stretch-mediated sodium channels leading to the establishment of a generator potential.

- The structure of a **mammalian eye** and its transmissive and refractive properties in focusing an image on the retina.
- The role of **rod cells and cone cells** in effecting monochromatic and trichromatic vision.
- The absorption of light by **rhodospin** causes a chemical change leading to the creation of a generator potential.

Details of hyperpolarisation are not required.

- The connection between sensory cells and the neurones of the optic nerve which allow **sensitivity and acuity of vision**.

Patterns of behaviour are integrated and controlled by the nervous system

- The pathway and adaptive value of a simple **spinal reflex** involving three neurones.
- An outline of the functions of the parasympathetic and sympathetic divisions of the **autonomic nervous system**.
- Specific physiological knowledge will only be required in the context of the control of heart rate.
- Taxes and kineses as simple responses** which can maintain an organism in a favorable environment.