*This is the **Higher Combined** version — includes Higher Tier content. Some Separate-only details are omitted.*

The nervous system allows rapid communication throughout the body, enabling it to respond to changes in the internal and external environment.

- CNS (central nervous system): brain and spinal cord — processes information and coordinates responses.
- PNS (peripheral nervous system): all other nerves — sensory nerves bring information to CNS; motor nerves carry instructions from CNS to effectors.
- Three types of neurone: sensory (receptor → CNS), relay (within CNS), motor (CNS → effector).
- Effectors: muscles (respond by contracting) or glands (respond by secreting hormones/enzymes).
- Stimulus → receptor → sensory neurone → CNS → motor neurone → effector → response.
- ★ **HT** Myelin sheath: fatty insulating layer around neurone axon. Speeds up electrical signal transmission. Formed by Schwann cells.
- ★ **HT** Nodes of Ranvier: gaps in the myelin sheath. Electrical signal jumps between nodes (saltatory conduction) — much faster than unmyelinated conduction.
- ★ **HT** Multiple sclerosis (MS): autoimmune disease that destroys the myelin sheath → nerve signals slowed or stopped.

Key Terms

Sensory neurone	Carries electrical impulses from receptors to the CNS
Relay neurone	Carries impulses within the CNS between sensory and motor neurones
Motor neurone	Carries electrical impulses from CNS to effectors (muscles and glands)
Myelin sheath	Fatty insulating layer around axons — speeds up nerve impulse transmission
Effector	A muscle or gland that carries out the body's response to a stimulus

■ **Exam Tip:** Know the three neurone types in order: SENSORY → RELAY → MOTOR (think: SRM). Always state where each one is found and what it connects.