

NEURAL CONTROL AND COORDINATION

Human neural system consists of two main parts, the central nervous system (CNS) and the peripheral nervous system (PNS).

Afferent fibres- transmit impulses from tissue/organ to CNS.

• **Efferent fibres**- transmit regulatory impulses from CNS to concerned peripheral organs.

The peripheral nervous system is subdivided into the

- Sensory nervous system
- Autonomic nervous system

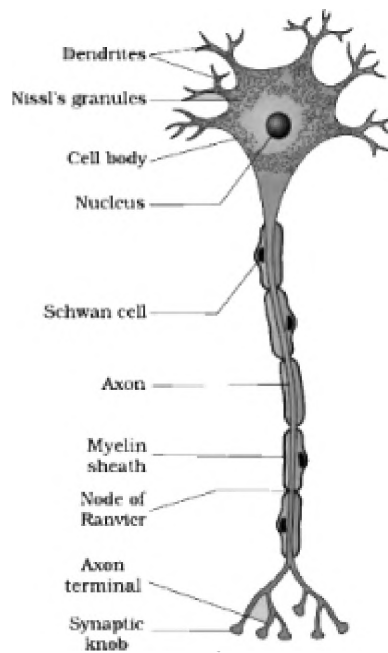
Somatic nervous systems relay impulses from CNS to skeletal muscles.

Autonomic nervous system transmits impulses from CNS to involuntary system and smooth muscles.

Neuron as **Structural and Functional Unit of Neural System**

Neuron is made up of three major parts - cell body, dendrite and axon.

• Cell body contains cytoplasm, cell organelles and Nissl's granules. Short fibres projecting out from cell body are called dendrites. The axon is long fibre having branched structure at the end that terminates into knob-like structure called synaptic knob.



- Based on number of axon and dendrites, neurons are of three types:-
 - Multipolar. one axon and two or more dendrites found in cerebral cortex.
 - Bipolar — one axon and one dendrite found in retina of eyes.
 - Unipolar - cell body with one axon only found in peripheral nervous system.

There are two types of axon-

- Myelinated axon - axon fibres are enveloped with Schwann cells to form myelin sheath around the axon. The gap between two myelin sheaths is called nodes of Ranvier. Found in spinal and cranial nerves.
- Unmyelinated nerve fibre is enclosed by Schwann cells that do not form myelin sheath around the axon. Found in autonomic and somatic nervous system.

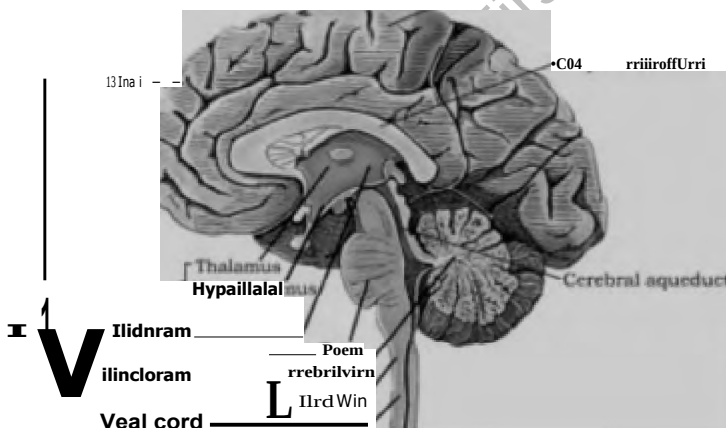
- The electrical potential difference across the resting membrane is called resting potential.

There are two types of synapses,

- Electrical synapse-
- Chemical synapse

Human brain is protected by skull (cranium) and cranial meninges, three layered membrane, outer dura mater, middle arachnoid and inner pia mater.

Brain can be divided into 3 parts- forebrain, midbrain and hindbrain. Forebrain - consists of cerebrum, thalamus and hypothalamus. Cerebrum is divided into left and right cerebral hemispheres. The outer layer of the cerebrum is called cerebral cortex (gray matter). Cerebral cortex contains sensory neuron, motor neuron and association area. Association area controls the memory and communication like (Ample): process-



Hypothalamus controls the urge for eating, drinking and body temperature. They also release hypothalamic hormones. Lirilitic 5Y5tern is involyed in controlling sexva I behavior and expression of emotional rearkions. liAldhrain InratPr between hypothalamus and poins ci.1 hind brain. Dorsal portion consists of four round lobes called corpora quad rigem ina_ They are involved in relay of impulses back and forth between cerebrum, cerebellum, pens and medulla.

Hind brain consists Di ports, medulla oblongata and cerebe II urn_ Pneumatic centre is present in hindbrain that control inspiration. They also relay impulses between the medulla and superior part of brain, Cerebellum controls balance and posture.

The path followed by reflex action is called reflex arc,

Human Eye — Epheric a I\$trurtore consists of three layers, external layer is Kiera whose inner mint layers is called cornea, middle layer choroid and Innermost layer Is called retina..

Human Ears

Divided into three regions ouster ear, middle ear and inner ear.