



NEET · CBSE eBOOKS

CLASS 11 & 12th



Learning Inquiry
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CLASS 11th

Neural Control and
Coordination

misostudy



01. Neural or Nervous System

The system which is responsible for coordination of various activities of different body parts amongst themselves and in response to stimuli of various kinds is called neural system or nervous system.

The basic unit of this system is neuron or nerve cell. Each neuron communicates with thousands of other neurons in a complex information-processing circuit.

02. Central Nervous System

The main parts of central nervous system are brain and spinal cord.

Brain

Brain has following main parts

Outer Coverings or Meninges

Both of them are covered by following three membranes called **meninges** (from outside to inside):

- (i) **Outer Duramater** : Thick, tough and collagenous fibrous layers.
- (ii) **Middle arachnoid** : Comparatively soft but non-vascularised, also called 'spider web'.
- (iii) **Inner piamater** : Highly vascularised and very soft.

Space between dura and arachnoid mater is called **sub-dural space**. Similarly space between piamater and arachnoid-mater is called **sub-arachnoid space**. These spaces are filled with Cerebrospinal Fluid (CSF).

In between the duramater and cranium, one more space is present, which is called **epidural space**.

Cerebrospinal Fluid (CSF)

The fluid present in and around brain and spinal cord is called cerebrospinal fluid. It is secreted by modified ependymal cells of brain which form plexus of cells called **choroid plexus**.

The main functions of CSF are as follows

- (i) It absorbs shock or jerk to protect brain and spinal cord.
- (ii) It serves as medium for exchange of nutrients and waste products between blood and nervous tissue.
- (iii) It serves as endocrine medium for transport of hormones.

Human Brain

It is situated in the cranium or skull. *It contains following parts*

(i) Forebrain or Prosencephalon

It is the largest part of the human brain and forms most of the anterior region. *It is further divided into*

(a) Olfactory lobe or Rhiencephalon

These are paired structures, anteroventral in position and functionally related to smell. Each structure is differentiated into an anterior, swollen part called **olfactory bulb** and posterior, narrow part called **olfactory tract**. It ends in olfactory area of temporal lobe of cerebral hemisphere.

(b) Cerebrum

It is the most developed part to human brain. A deep cleft divides the cerebrum longitudinally into two halves namely the left and right cerebral hemispheres. Both of these hemispheres are connected by a nerve fibre band called **corpus callosum**. It is the characteristic of mammals only.

The specialised functions like intelligence, learning skill, memory, speech, etc. all are attributed to cerebrum. The roof of cortex is called neopallium in mammals and pallium in other vertebrates. *Each of these is further divided into the following five lobes*

- **Frontal lobe :**

It is present towards forehead and mainly contains prefrontal area, premotor area and motor area. It has a motor area called **Broca's centre**. Which initiates the movement of lips, tongue and larynx to produce speech.

Frontal lobe is the centre of knowledge, creativity, wisdom, reasoning, judgement, logic, intelligence, creativity, ideas and dreams.

- **Parietal lobe :**

It is present in the middle and has somato-sensory areas for speech, i.e.

Broadman's area. It is also the centre for perception of pain, pressure, taste, touch and temperature.

- **Insular lobe :**

This lobe is hidden, as it lies deep in the Sylvian fissure.

- **Occipital lobe :**

It is present in the posterior most region of the brain. it is the area for vision and visual interpretations.

- **Temporal lobe :**

It is present close to ear. It has olfactory area for smell and auditory area for hearing. It also has Wernicke's area for understanding of speech.

