Chapter 18

Neural Control and Coordination

- Neural System
- Human Neural System
- Neuron as Structural and Functional Unit of Neural System
  - Generation and Conduction of Nerve Impulse
  - Transmission of Impluses
- Central Neural System
  - Forebrain
  - Midbrain
  - Hindbrain
- Reflex Action and Reflex Arc
- Sensory Reception and Processing
- Smell Receptors (Olfactoreceptors)
- Taste Receptors (Gustatoreceptors)
- Eye
- Ears

NERVOUS SYSTEM

- Functions of all organs or organ system of our body must be coordinated to main tan homeostasis or normal physiology of our body.
- In human body the neural system and the endocrine system jointly coordinate and integrate activities of all the organs so that they function in a synchronized fashion.
- Co-ordination is the process through which two or more organs interact & complement the functions of one another.
- For example, when we do physical exercises, the energy demand is increased for maintaining an increased muscular activity. The supply of oxygen is also increased. The increased supply of oxygen necessitates an increase in the rate of respiration, heart beat and increased blood flow via blood vessels.
- The neural system provides an organised network of point-to-point connections for a quick coordination.
- The endocrine system provides chemical integration through hormones.
- Nervous system and endocrine system are called Integrative system of the body.

	Neural Co-ordination	Endocrine Co-ordination (Chemical Co-ordination)
1.	Information passes as electrical impulses along nerve fibres.	Information passes as a chemical substance through the blood and lymph.
2.	There is rapid transmission of information	There is slow transmission of information.
3.	Response is immediate, very exact and short lived.	Response is usually slow, wide spread and long lasting.

- Nervous system offers high speed services but nerve fibres do not innervate all cells of the body and the cellular functions need to be continuously regulated, therefore a special kind of coordination and integration at the level of cells is provided by hormones.

NEURAL SYSTEM

- The neural system of all animals is composed of highly specialised cells called neurons which can detect, receive and transmit different kinds of stimuli.
- The neural organisation is very simple in lower invertebrates.
  For example, in Hydra it is composed of a network of neurons.
- The neural system is better organised in insects, where a brain is present along with a number of ganglia and neural tissues.
- The vertebrates have a more developed neural system.