

## Topic 1

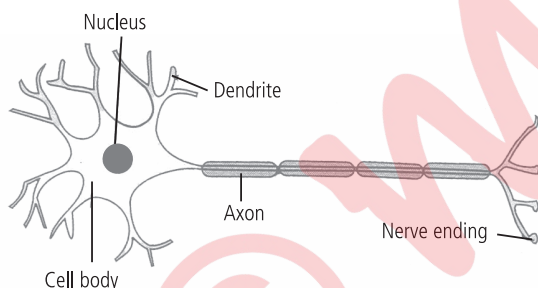
1. (b)

2. (d)

3. The receptors in our body collect information about changes in the environment around us in the form of stimuli. They are located in our sense organs such as the inner ear, nose, tongue, eye, etc. These then pass the information in the form of nerve impulses to central nervous system (spinal cord and brain) where message is interpreted and instructions are sent to effectors which reveal responses.

When receptors do not work properly, the environmental stimuli are not able to create nerve impulses and body does not respond.

4. Structure of a neuron is as follows :



Functions— The information acquired at the end of the dendritic tip of a neuron sets off a chemical reaction which creates an electrical impulse. The impulse travels from the dendrite along the axon of its end. At the end of axon, the impulse sets off the release of some chemicals, which cross the synapse and start a similar impulse in a dendrite of the next neuron.

In this way nerve impulses travel in the body. Thus, nervous tissue is made up of an organised network of neurons which are specialised for conducting information *via* electrical impulse from one part of the body to another.

5. The following signals will get disrupted in case of a spinal cord injury:

- Reflex action

- Impulses from various body parts will not be conducted to brain.
- Message from brain will not be conducted to various organs of the body.

6. Involuntary action :

- (i) Involuntary action involves autonomic nervous system.
- (ii) They occur in response to internal stimuli.
- (iii) They are connected with functioning of internal body parts.
- (iv) It occurs without the will of the organism. For example, heart beat, breathing, etc.
- (v) Many of these involuntary actions are controlled by the midbrain and hindbrain.

Reflex action :

- (i) Reflex action involves all parts of voluntary nervous system though they are not voluntary.
- (ii) They operate against harmful stimuli which are generally external.
- (iii) They are connected with emergency *i.e.*, response to stimuli.
- (iv) Some reflexes involve the brain, rather than the spinal cord.
- (v) Reflex is generally controlled by spinal cord.

## Topic 2

1. The body of a multicellular organism consists of a number of components and sub-components and each is specialised to perform a particular function. Therefore, it is necessary that various organs of the body of an organism work together in a proper manner for proper functioning to a stimulus. In human beings nervous system and endocrine system work together for control and coordination.
2. Differences between neural and hormonal mechanisms for control and coordination in animals are :

S. No.	Neural coordination	Hormonal coordination
(i)	It is sent as electrical impulses along nerve fibres.	It is sent as a chemical messenger <i>via</i> blood or lymph.
(ii)	Information travels rapidly, in milliseconds.	Information travels slowly.
(iii)	Information is directed to specific receptor - one or a few nerve fibres, gland cells or other neurons, <i>i.e.</i> , it is addressed by name.	Information is spread throughout the body by blood from which the target cells or organs pick it up, <i>i.e.</i> , it is addressed to 'whom it may concern'.
(iv)	It gets response immediately.	It gets response usually slowly.
(v)	Its effects are short-lived.	Its effects are generally more prolonged.

### Topic 3

- (d) Cytokinin is a plant growth hormone which enhance cytokinesis in the cells of various plant tissues.
- Phototropism is a directional growth which occurs in response to unidirectional exposure to light. Phototropic movement is generally caused by increased auxin on the darker side and lesser auxin on the illuminated side. Due

to the presence of more auxin, the part of the plant stem in the dark grows faster, causing it to bend towards the source of light.

- In plants, chemical coordination occurs by plant hormones or phytohormones. Plant hormones are chemical substances other than nutrients, which are produced at specific places in the plant (usually at tips of shoots, roots and branches), and then are diffused to a specific site or translocate (*via* phloem/xylem) to other sites. Phytohormones produce effects like cell multiplication, growth, opening of flowers and regulate many physiological processes.
- The differences between movement in a sensitive plant and the movement in our legs are as follows :

S. No.	Movement in a sensitive plant	Movement in legs
(i)	It occurs in response to an external stimulus like touch, pressure or shock.	It occurs mainly due to voluntarily response as per our need and will.
(ii)	It is brought about by turgor changes in specific cells.	It is brought about by contraction and relaxation of muscles.
(iii)	It is controlled by plant hormones.	It is controlled by cerebellum of the hindbrain.

