

NCERT Solutions for Class 10 Science

Chapter 6 – Control and Coordination

Intext Questions with Solutions of Class 10 Science Chapter 6 – Control and Coordination

1.

What is the difference between a reflex action and walking?

Ans: Reflex actions represent the automatic responses that manifest in reaction to various stimuli. These phenomena transpire independently of the conscious regions of the brain. All reflex actions occur without conscious awareness. Reflex action encompasses the intricate functions of the brain and spinal cord within the central nervous system.

Conversely, voluntary actions are those that transpire under the governance of the cerebellum within the brain. The acquisition of walking occurs as we develop over time. Ambulation is governed by cerebral processes and is deliberately employed as needed.

2.

What happens at the synapse between two neurons?

Ans: As soon as a nerve impulse hits the end of an axon, neurotransmitters, such as acetylcholine, are released.

The axon-dendrite junction is where neurotransmitters go from the axon of one neuron to the dendrites of the next cell. This spot between nerve cells is called a synapse.

It's possible for the nerve impulse to get to the target spot because neurotransmitters bind to the membranes of the dendrites. (cells of muscle)

3.

Which part of the brain maintains posture and equilibrium of the body?

Ans: The cerebellum, an integral component of the brain, plays a crucial role in the regulation of motor functions. Consequently, it is the component responsible for the preservation of posture and the balance of the body.

4.

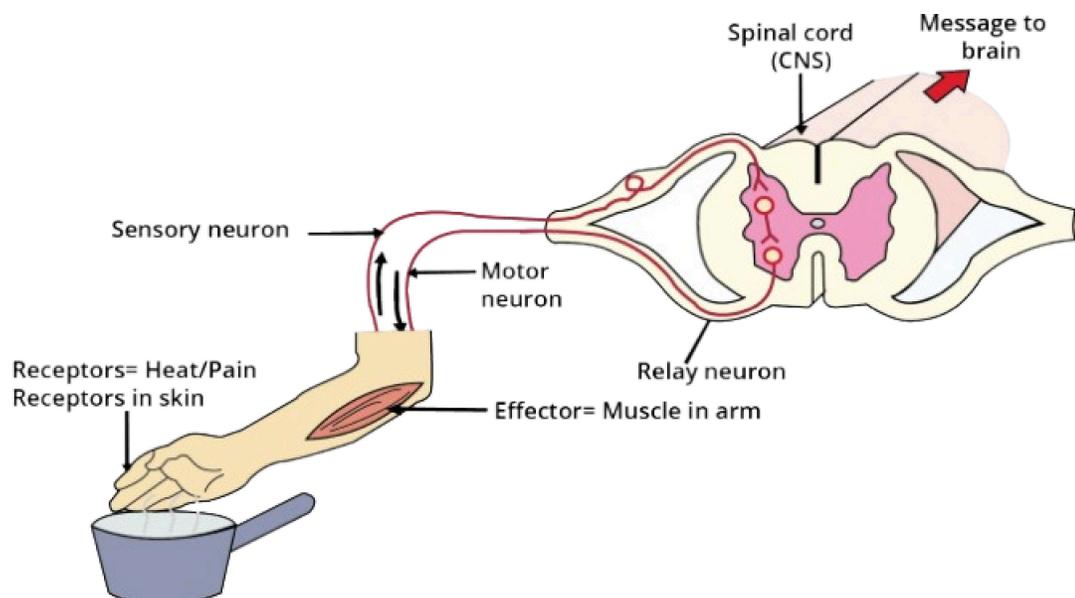
How do we detect the smell of an agarbatti (incense stick)?

Ans: The scent of agarbatti (incense stick) fills the air. It is picked up by the nose's olfactory receptors. This information is sent to olfactory lobe by sensory nerves located in the forebrain. It replies to the information received.

5.

What is the role of the brain in reflex action?

Ans: Humans react instantly to changes in their surroundings through reflex action. Motor neurons regulate muscle activity, whereas sensory nerves pick up stimuli. In a reflex arc, effectors react rapidly to a signal received by receptors. Receptors and effectors use the reflex arc to communicate during reflex activities. Sensory and motor neurons in the spinal cord are responsible for signaling. Although they originate in the spinal cord, reflex arcs transmit information to the brain. The brain only knows the signal and the response. This information is stored in brain memory. This aids in reaction training. But the response is not generated by the brain.



6.

What are plant hormones?

Ans: Plant hormones are referred to as phytohormones. Plant hormones are chemical substances that regulate growth, flowering, height, development, and environmental responses in plants.

The various types of phytohormones include auxins, gibberellins, cytokinins, abscisic acid, and ethylene.

7.

How is the movement of leaves of the sensitive plant different from the movement of a shoot towards light?

Ans:

| Movement of leaves of sensitive plant | Movement of a shoot towards light |
|--|---|
| 1. It is a nastic movement that is independent of the stimulus's direction. | 1. The direction of the applied stimulus determines the tropic movement. |
| 2. Touch is the stimulation. | 2. Light is the stimulus.3. The uneven growth on the two sides of the shoot is the cause. |
| 3. The abrupt loss of water from the swellings at the base of the leaves is the cause. | 3. The uneven growth on the two sides of the shoot is the cause. |
| 4. It's not a movement for growth. | 4. The movement is a growth movement. |

8.

Give an example of a plant hormone that promotes growth.

Ans: Auxin

9.

How do auxins promote the growth of a tendril around a support?

Ans: Auxin is a plant growth hormone that is made at the tip of the shoot. It helps the cells at the tips of the shoots get longer. When a tendril hits a support, auxin makes cells on the other side grow faster. This makes the growth uneven on both sides of the tendril. This makes the tendril

wind around the base. Because of this, as the strands wrap around the support, they look like a watch spring.

10.

Design an experiment to demonstrate hydrotropism.

Ans: To show hydrotropism in plants.

Procedure:

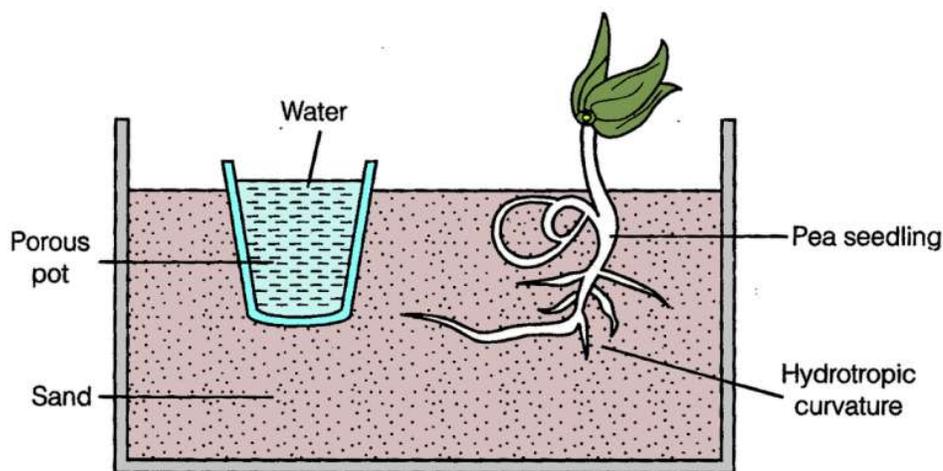
- i. Place a seedling in a vase containing soil.
- ii. Place a permeable container filled with water next to the seedling.
- iii. Leave the setup for a few days.

Observation:

Examining the roots reveals that they bend towards the source of water and do not grow straight.

Result:

It confirms that plants exhibit hydrotropism, since their roots bend towards the porous pot of water. Hydrotropism is a plant growth response in which the direction of growth is influenced by a water concentration gradient.



11.

How does chemical coordination take place in animals?

Ans: Chemical coordination in animals occurs via hormones released by the endocrine glands. In animals, coordination occurs through both the hormone and neurological systems, known as the endocrine system. Endocrine glands produce animal hormones straight into the bloodstream,

where they reach specific cells. Special molecules on the surface of cells detect these hormones. These cells respond to the information contained in a certain hormone.

12.

Why is the use of iodised salt advisable?

Ans: It is best to use iodized salt since the thyroid gland needs iodine to make the hormone thyroxin. Thyroxin hormone regulates all metabolic processes in the body, including the metabolism of carbohydrates, lipids, and proteins. A lack of thyroxin causes a disorder called goitre.

13.

How does our body respond when adrenaline is secreted into the blood?

Ans: Adrenaline is also known as epinephrine and norepinephrine, respectively. Adrenaline stimulates the sympathetic nervous system. It prepares the body for any event that might occur. Adrenaline secretion causes fear, perspiration, and shivering, among other bodily reactions. All of these responses increase oxygen delivery to muscular tissues for breathing, releasing more energy for flight or fight. As a result, adrenaline enables the body to cope with any stress or calamity. As a result, it is often called the "emergency hormone."

14.

Why are some patients of diabetes treated by giving injections of insulin?

Ans: The insulin hormone regulates blood sugar levels. If this is not secreted in the appropriate levels, the blood sugar level rises. This has many negative consequences. Diabetic patients are treated with insulin injections to alleviate the negative effects of high blood sugar levels.

Exercise Questions with Solutions of Class 10 Science Chapter 6 – Control and Coordination

1.

Which of the following is a plant hormone?

- (a) Insulin (b) Thyroxin
(c) Oestrogen (d) Cytokinin.**

Ans: (d) Cytokinin

2.

**The gap between two neurons is called a
(a) dendrite. (b) synapse. (c) axon. (d) impulse.**

Ans: (b) Synapse

3.

**The brain is responsible for
(a) thinking. (b) regulating the heart beat.
(c) balancing the body. (d) all of the above.**

Ans: (b) All of the above

4.

**What is the function of receptors in our body?
Think of situations where receptors do not work
properly. What problems are likely to arise?**

Ans: Specialized cells called receptors are found in the skin, tongue, eyes, nose, and ears, among other sense organs. Receptors are used to pick up information from their surroundings. Olfactory receptors, for instance, pick up scent. The brain or spinal cord will not receive information from the environment as quickly if receptors are malfunctioning. The body will suffer damage as a result of the delayed reaction to the external stimulation. For instance, if a person has damaged skin receptors and inadvertently touches a hot object, their hands may burn because the damaged receptors are unable to sense pain and heat from the environment.

5.

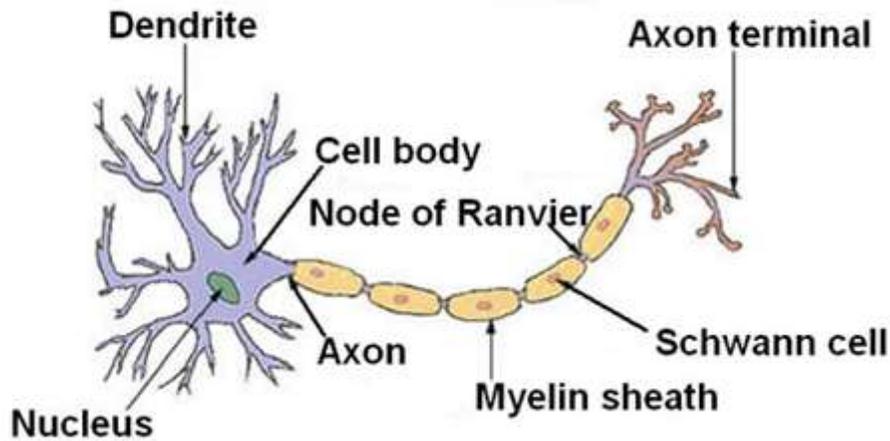
**Draw the structure of a neuron and explain its
function.**

Ans: Nerve cells, or neurons, are the nervous system's functional components. Axons, cell bodies, and dendrites are the three primary components of neurons.

Dendrite: Information is detected by the dendrite and sent to the cell body.

Cell Body: Preserves the cell's growth

Axon: Sends signals to the subsequent neuron after carrying messages out of the cell body.



6.

How does phototropism occur in plants?

Ans: Phototropism is the movement caused by light in any portion of a plant. Plants exhibit negative phototropism in their roots and positive phototropism in their shoots.

The hormone auxin is responsible for phototropism in plants. When one side of a plant receives light, the side that is not exposed to the light secretes more auxin hormone. As a result, auxin makes the cells in the shaded area longer. The plant so seems to bend in the direction of the light.

7.

Which signals will get disrupted in case of a spinal cord injury?

Ans: An injury to the spinal cord will prevent any and all nerve signals from reaching the brain. This will influence how the brain receives impulses from receptors and how the brain responds to effectors, especially motor neurons.

8.

How does chemical coordination occur in plants?

Ans: Hormones are a type of chemical substance that regulates and coordinates plant growth, development, and environmental responses. Hormones are created in one section of the plant and transported throughout the plant. Auxins, gibberellins, cytokinins, abscisic acid, and ethylene are the five major categories of phytohormones. These phytohormones either stimulate growth (auxins, gibberellins, cytokinins, and ethylene) or inhibit growth (abscisic acid).

9.

What is the need for a system of control and coordination in an organism?

Ans: For the following purposes, an organism requires a control and coordination system:

- i. To protect the organisms' bodies from damaging environmental changes.
- ii. To regulate the rate of both involuntary and voluntary movements.
- iii. To be able to learn and think in order to react to any stimuli.

10.

How are involuntary actions and reflex actions different from each other?

Ans:

| Reflex actions | Involuntary actions |
|--|--|
| 1. Quick, instinctive reactions to a stimulus that don't require conscious brain activity. | 1. Takes place without an organism's awareness. |
| 2. Spinal cord-controlled. | 2. Managed by the medulla oblongata or midbrain. |
| 3. Extremely rapid and immediate. | 3. A little more slowly. |
| 4. Any muscle or gland may be affected. | 4. Only smooth muscles are used. |
| 5. Examples include salivation and eye blinking. | 5. Examples are blood circulation and heartbeat. |

11.

Compare and contrast nervous and hormonal mechanisms for control and coordination in animals.

Ans:

| Nervous mechanism | Hormonal mechanism |
|-----------------------------------|-----------------------------------|
| It is a rapid procedure. | It is a gradual process. |
| Arteries and organs are impacted. | It influences the intended organ. |

| Nervous mechanism | Hormonal mechanism |
|--|---------------------------------------|
| It transmits in an electrochemical form. | It is transmitted in a chemical form. |
| It does not regulate metabolism. | It regulates metabolism. |
| Growth is unaffected. | Growth is influenced. |

12.

What is the difference between the manner in which movement takes place in a sensitive plant and the movement in our legs?

Ans:

| Movement in sensitive plants | Movement in our legs |
|--|---|
| 1. The movement observed in a sensitive plant constitutes a reaction to a stimulus, specifically touch, which occurs as an involuntary response. | 1. The motion of our legs constitutes a deliberate act of will. |
| 2. There exists no distinct tissue dedicated to the transfer of information. Furthermore | 2. A comprehensive system comprising the central nervous system and peripheral nervous system exists for the exchange of information. |
| 3. plant cells lack specialized proteins that facilitate movement. | 3. Animal cells possess specialized proteins that facilitate the contraction of muscles. |