# Chapter 6 – Control and Coordination

## Answers to In-text and excirse Questions

**Nervous System**

**Question 1.**

What is the difference between a reflex action and walking?

**Answer:**

| **Reflex Action** | **Walking** |
|---|---|
| It is a quick and involuntary action. | It is a voluntary action. |
| Controlled by the spinal cord. | Controlled by the brain. |
| Example: Withdrawing the hand from a hot object. | Example: Walking or running. |

**Question 2.**

What happens at the synapse between two nerve cells (neurons)?

**Answer:**

At a synapse, nerve impulses are transmitted from one neuron to another through chemical substances called neurotransmitters.

**Question 3.**

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

**Answer:**

The **Cerebellum** maintains posture and balance.

**Question 4.**

How do we detect the smell of an incense stick?

**Answer:**

The smell particles stimulate the olfactory receptors present in the nose. These receptors send signals to the brain, which helps us recognize the smell.

**Question 5.**

What is the role of the brain in a reflex action?

**Answer:**

Reflex actions are mainly controlled by the spinal cord. The brain receives information about the action after it has occurred.

**Control and Coordination in Plants**

**Question 6.**

What are plant hormones?

**Answer:**

Plant hormones are chemical substances produced in plants that regulate growth, development, and various life processes.

**Question 7.**

How is the movement of Mimosa (Touch-me-not) leaves different from the movement of a shoot towards light?

**Answer:**

| **Movement of Mimosa Leaves** | **Phototropism** |
|---|---|
| Occurs in response to touch. | Occurs in response to light. |
| Not dependent on growth. | Dependent on growth. |
| Fast movement. | Comparatively slow movement. |

**Question 8.**

Give an example of a plant hormone that promotes growth.

**Answer:**

**Auxin**

**Question 9.**

How does auxin help a tendril grow around a support?

**Answer:**

Auxin accumulates on the side of the tendril opposite to the support. Cells on that side grow faster, causing the tendril to bend toward and coil around the support.

**Question 10.**

Design an experiment to demonstrate hydrotropism.

**Answer:**

Plant a seedling in a pot and place water on one side of the pot. After a few days, the roots will grow towards the water source, demonstrating hydrotropism.

**Hormones and Endocrine System**

**Question 11.**

How does chemical coordination occur in animals?

**Answer:**

Chemical coordination in animals is carried out by hormones. Hormones are secreted by endocrine glands and transported by blood to different parts of the body.

**Question 12.**

Why is the use of iodized salt recommended?

**Answer:**

Iodine is essential for the production of thyroxine hormone. Its deficiency can cause goitre.

**Question 13.**

What happens in our body when adrenaline is secreted into the blood?

**Answer:**

- Heartbeat increases.
- Breathing rate increases.
- Blood pressure rises.
- More blood is supplied to muscles.

This is called the **"Fight or Flight" response**.

**Question 14.**

Why are some diabetic patients treated with insulin injections?

**Answer:**

Because their bodies do not produce sufficient insulin. Insulin helps regulate the level of glucose in the blood.

**Exercise Answers**

**Question 1.**

Which of the following is a plant hormone?

**Answer:**

**(d) Cytokinin**

**Question 2.**

The gap between two nerve cells is called:

**Answer:**

**(b) Synapse**

**Question 3.**

The brain is responsible for:

**Answer:**

**(d) All of the above**

**Question 4.**

What is the function of receptors in our body? What problems may arise if they do not function properly?

**Answer:**

Receptors detect stimuli from the environment and send signals to the nervous system.

If receptors do not function properly:

- We may not be able to detect light, sound, smell, or touch.
- The body may fail to respond appropriately to environmental changes.

**Question 5.**

Draw the structure of a neuron and describe its functions.

**Answer:**

**Structure:**

- Cell body (Cyton)
- Dendrites
- Axon

**Function:**

To transmit nerve impulses from one part of the body to another.

**Question 6.**

How does phototropism occur in plants?

**Answer:**

Auxin accumulates on the shaded side of the stem, causing cells there to grow faster. As a result, the stem bends towards the light.

**Question 7.**

Which signals will be affected in case of spinal cord injury?

**Answer:**

The transmission of nerve impulses between the brain and various parts of the body will be disrupted.

**Question 8.**

How does chemical coordination occur in plants?

**Answer:**

Chemical coordination in plants occurs through plant hormones such as:

- Auxin
- Gibberellin

- Cytokinin
- Abscisic Acid

**Question 9.**

Why is a control and coordination system necessary in living organisms?

**Answer:**

It is necessary to regulate various body activities and enable the organism to respond appropriately to environmental changes.

**Question 10.**

How are involuntary actions different from reflex actions?

| **Involuntary Actions** | **Reflex Actions** |
|---|---|
| Occur continuously. | Occur suddenly in response to a stimulus. |
| Controlled mainly by the brain. | Controlled mainly by the spinal cord. |
| Example: Heartbeat | Example: Withdrawing hand from a hot object |

**Question 11.**

Compare and contrast nervous control and hormonal control in animals.

| **Nervous Control** | **Hormonal Control** |
|---|---|
| Acts very quickly. | Acts relatively slowly. |
| Uses electrical impulses. | Uses chemical messengers (hormones). |
| Effect is short-lived. | Effect is long-lasting. |

**Question 12.**

How is the movement in a Mimosa plant different from the movement of our leg?

**Answer:**

- In Mimosa, movement occurs due to changes in turgor pressure within cells.
- In our leg, movement occurs due to contraction and relaxation of muscles.