

# Control and Coordination

## **Nervous System (Questions 1-6)**

1. What is the need for control and coordination in organisms? How do plants and animals achieve coordination?
2. Define reflex action. Explain the pathway of a reflex arc with the help of an example like withdrawal of hand from a hot object.
3. Describe the structure and functions of a neuron. Draw a labeled diagram of a neuron.
4. Differentiate between voluntary and involuntary actions. Give two examples of each.
5. Explain the structure and functions of the human brain. Why is the brain called the control center of the body?
6. What is synapse? How does nerve impulse cross a synapse? Why does a nerve impulse travel in only one direction?

## **Hormonal System (Questions 7-12)**

7. What are hormones? How do they differ from nervous control? Name the gland that controls all other glands.
8. Name the hormone secreted by thyroid gland. What are the functions of this hormone and what happens in its deficiency?
9. Explain the role of insulin in regulating blood sugar levels. What is diabetes and how can it be controlled?
10. What are the functions of adrenaline hormone? Why is it called the "fight or flight" hormone?
11. Describe the role of growth hormone. What problems arise due to its excess and deficiency?
12. Explain the feedback mechanism in hormone regulation with the example of insulin and glucagon.

## **Plant Coordination (Questions 13-17)**

13. How do plants respond to stimuli without a nervous system? What are plant hormones called?
14. What is phototropism? Explain how auxin causes phototropic movement in plants.
15. Define the following tropisms with examples: geotropism, hydrotropism, chemotropism, and thigmotropism.

16. Describe nastic movements in plants. How do they differ from tropic movements? Give examples.

17. What happens to a potted plant kept in a dark room with a small window? Explain the scientific reason behind this observation.

### **Integration and Application (Questions 18-20)**

18. A person accidentally touches a flame and immediately withdraws his hand, but feels the pain a moment later. Explain this observation in terms of reflex action and conscious experience.

19. Compare and contrast nervous and hormonal coordination in terms of speed of response, duration of effect, and mode of transmission.

20. A gardener wants to increase the number of roots in his plant cuttings. Which plant hormone should he use and why? How does this hormone work?

### **Additional Application-Based Questions:**

#### **Higher Order Thinking Questions:**

- Why do some people get goosebumps when they are scared or cold? Explain the mechanism involved.
- A student feels nervous before an exam and experiences increased heart rate and sweating. Which hormone is responsible and why?
- Explain why a person may lose consciousness due to low blood sugar but not due to high blood sugar immediately.
- How does the coordination system help in maintaining homeostasis in the human body?
- Why do plants bend towards light even though they don't have eyes or a nervous system?

#### **Practical Application Questions:**

- A diabetic patient sometimes becomes unconscious. What could be the reason and what immediate help should be provided?
- Why do tendrils of a pea plant coil around a support? What type of movement is this?
- Explain why a person's pupil size changes when moving from a dark room to bright sunlight.
- How does the spinal cord help in reflex actions? What would happen if the spinal cord is damaged?

- Why do gibberellins cause "foolish seedling" disease in rice plants?