

Control and Coordination

Solution 1:

Living things act in response to their environment in the following manner:

1. In summer, the atmospheric temperature is very high, and so, we feel hot. Even then, our body temperature is maintained at about 37°C. This is possible because our skin produces sweat as the atmospheric temperature rises. As sweat evaporates, it helps to lower our skin temperature and we feel thirsty, and hence, we drink more water.
2. In winter, the atmospheric temperature is very low and we feel cold, yet our body temperature is maintained at 37°C. This is because our body produces more heat energy, and we tend to eat foods which provide more energy.
3. In case of plants, when the leaves of the *Mimosa* plant are touched, they react by closing up. When we take away our fingers, they open again. This is a response to touch.

In this way, as the outside conditions change, life processes in living things change accordingly.

Solution 2:

The main parts of the nervous system are the brain, spinal cord and nerves.

Solution 3:

The irreversible changes such as increase in height and weight or the change in shape and size which take place in the body of living things constitute growth.

Solution 4:

In response to a stimulus, plants can move their parts of the body but cannot move from one place to another like animals. Some of the examples of movements in plants:

1. The leaves of *Mimosa* plant close on touching and open again after some time.
2. Blossoming of a bud into a flower.
3. Blossoming of a blooming jasmine flower only at night.
4. The growth of roots deep into the soil in search of water.
5. The growth of stem towards sunlight.
6. Characteristic movements of insectivorous plants such as *Drosera* and pitcher plant to catch their prey.

Solution 5:

1. Reflex action: The instant, involuntary reaction of the body carried out by the spinal cord in response to a stimulus is called reflex action.

2. Hormones: The chemical substances secreted by the endocrine glands which control life processes and movements of animals are called hormones.

Solution 6.a:

Homeostasis

1. The continuous process of adjustment by the body to maintain the optimum level inside the body with regard to the external environmental conditions is called homeostasis.
2. The conditions inside and outside the body change all the time. Temperature also varies with seasons.
3. However, the temperature of the human body remains constant in all the seasons. It is maintained at about 37°C.
4. For this maintenance, the body takes appropriate measures automatically and remains in homeostasis.

Solution 6.b:

Endocrine system

1. The endocrine system in human beings consists of various ductless glands which secrete chemical substances called hormones.
2. Hormones are secreted in very small quantities yet control the life processes and movements of animals.
3. The organs which secrete hormones are called endocrine glands.
4. Endocrine glands are situated only at specific sites in the human body but the hormones bring about their effects all over the body.
5. The hormones enter the blood stream directly, spread throughout the body and function at various places which are far away from the glands which secrete them.
6. Pituitary gland, thyroid gland, adrenal gland, pineal gland and thymus are some of the major endocrine glands of the body.

Solution 7:

1. Afferent nerves: Afferent nerves bring information from the different parts of the body to the brain and spinal cord.
2. Efferent nerves: Efferent nerves carry the commands given by the brain and spinal cord to the different parts of the body.

Solution 8:

Examples of reflex action:

1. Watering of the mouth at the sight of sour tamarind.
2. Covering the ears with our hands when a cracker is lighted.
3. Pulling away the hand on touching a hot object.
4. Screaming and pulling away the fingers at the prick of a needle.