Control And Coordination

Multiple Choice Questions

Question 1.
Which of the following statements is correct about receptors?
A. Gustatory receptors detect taste while olfactory receptors detect smell

B. Both gustatory and olfactory receptors detect smell

C. Auditory receptors detect smell and olfactory receptors detect taste

D. Olfactory receptors detect taste and gustatory receptors smell

Answer:
All information from our environment is detected by the specialized tips of some nerve cells. These receptors are usually located in our sense organs, such as the inner ear, the nose, the tongue, and so on. So gustatory receptors will detect taste while olfactory receptors will detect smell.

Question 2.
Electrical impulse travels in a neuron from
A. Dendrite → axon → axonal end → cell body

B. Cell body → dendrite → axon → axonal end

C. Dendrite → cell body → axon → axonal end

D. Axonal end → axon → cell body → dendrite

Answer:
Neuron is the structural and functional unit of the nervous system. Nerve impulse travels in a neuron from dendrite to the cell body, and then along the axon to its end.

Question 3.
In a synapse, chemical signal is transmitted from
A. Dendritic end of one neuron to axonal end of another neuron

B. Axon to cell body of the same neuron

C. Cell body to axonal end of the same neuron

D. Axonal end of one neuron to dendritic end of another neuron

Answer:
Nerve impulse carried out by a gap called synapse between a pair of neurons by means of neurotransmitter. In a synapse, chemical signal is transmitted from axonal end of one neuron to dendritic end of another neuron.

Question 4.
In a neuron, conversion of electrical signal to a chemical signal occurs at/in
A. Cell body

B. Axonal end

C. Dendritic end

D. Axon

Answer:
In a neuron, conversion of electrical signal to a chemical signal occurs in Axonal end for onward transmission. An axon terminal is the end of the axon that conducts electric signal to a nerve synapse.

Question 5.
Which is the correct sequence of the components of a reflex arc?
A. Receptors → Muscles → Sensory neuron → Motor neuron → Spinal cord

B. Receptors → Motor neuron → Spinal cord → Sensory neuron → Muscle

C. Receptors → Spinal cord → Sensory neuron → Motor neuron → Muscle

D. Receptors → Sensory neuron → Spinal cord → Motor neuron → Muscle

Answer:

The path through which signals are transmitted from a receptor to a muscle or a gland is called reflex arc.

The correct sequence of the components of a reflex arc is –

Receptors → Sensory neuron → Spinal cord → Motor neuron → Muscle

Stimulus received by the sensory receptors. Then sensory neuron or nerve carries signals from receptors to spinal cord. Impulses travels from the spinal cord to the motor neuron. The end of motor neuron connects effector organ or muscles which produce response.

Question 6.
Which of the following statements are true?

1. Sudden action in response to something in the environment is called reflex action.

2. Sensory neurons carry signals from spinal cord to muscles.

3. Motor neurons carry signals from receptors to spinal cord.

4. The path through which signals are transmitted from a receptor to a muscle or a gland is called reflex arc.
A. (i) and (ii)

B. (i) and (iii)

C. (i) and (iv)

D. (i), (ii) and (iii)

Answer:
Sudden action in response to something in the environment is called reflex action.
The path through which signals are transmitted from a receptor to a muscle or a gland is called reflex arc.

Question 7.
Which of the following statements are true about the brain?

1. The main thinking part of brain is hind brain.

2. Centres of hearing, smell, memory, sight, etC. are located in forebrain.

3. Involuntary actions like salivation, vomiting, blood pressure are controlled by the medulla in the hindbrain.

4. Cerebellum does not control posture and balance of the body
A. (i) and (ii)

B. (i), (ii) and (iii)

C. (ii) and (iii)

D. (iii) and (iv)

Answer:
The fore-brain is the main thinking part of the brain. Separate areas of the fore-brain are specialised for hearing, smell, sight and so on. Many of the involuntary actions are controlled by the mid-brain and hind-brain. Involuntary actions like salivation, vomiting, blood pressure are controlled by the medulla in the hindbrain. Cerebellum controls posture and balance of the body.

Question 8.
Posture and balance of the body is controlled by
A. Cerebrum

B. Cerebellum

C. Medulla

D. Pons

Answer:
Cerebellum responsible for precision of voluntary actions and maintaining the posture and balance of the body.

Question 9.
Spinal cord originates from
A. Cerebrum

B. Medulla

C. Pons

D. Cerebellum

Answer:
The brain and spinal cord constitute the central nervous system. Spinal cord originates from medulla.

Question 10.
The movement of shoot towards light is
A. Geotropism

B. Hydrotropism

C. Chemotropism

D. Phototropism

Answer:
The movement of shoot towards light is Phototropism. Phototropism is one of the many plant tropisms or movements which respond to external stimuli.

Question 11.
The main function of abscissic acid in plants is to
A. Increase the length of cells

B. Promote cell division

C. Inhibit growth

D. Promote growth of stem

Answer:
The main function of abscisic acid in plants is to inhibit growth.

Question 12.

The growth of tendril in pea plants is due to
A. Effect of light

B. Effect of gravity

C. Rapid cell divisions in tendrillar cells that are away from the support

D. Rapid cell divisions in tendrillar cells in contact with the support

Answer:
Some plants like pea plant climb up other plants by means of tendrils. The tendril is sensitive to touch. The growth of tendril in pea plants is due to rapid cell divisions in tendrillar cells that are away from the object.

Question 13.
The growth of pollen tubes towards ovules is due to
A. Hydrotropism

B. Chemotropism

C. Geotropism

D. Phototropism

Answer:
The movement of plant part due to chemical stimuli is called chemotropism. For example- pollen tube grows towards ovules in response certain chemical.

Question 14.
The movement of sunflower in accordance with the path of sun is due to
A. Phototropism

B. Geotropism

C. Chemotropism

D. Hydrotropism

Answer:
The growth and movement of a plant shoot towards the light is known as phototropism. Example-The movement of sunflower in the direction of sun is Phototropism.

Question 15.
The substance that triggers the fall of mature leaves and fruits from plants is due to
A. Auxin

B. Gibberellin

C. Abscissic acid

D. Cytokinin

Answer:
The substance that triggers the fall of mature leaves and fruits from plants is due to abscisic acid.

Question 16.
Which of the following is not associated with growth of plant?
A. Auxin

B. Gibberellins

C. Cytokinins

D. Abscissic acid

Answer:
Abscisic acid is an example of hormone which inhibits growth of plant.

Question 17.
Iodine is necessary for the synthesis of which hormone?
A. Adrenaline

B. Thyroxin

C. Auxin

D. Insulin

Answer:
Iodine is necessary for the thyroid gland to synthesis thyroxine hormone. Thyroxine hormone regulates carbohydrate, protein and fat metabolism in the body so as to provide the best balance for growth.

Question 18.
Choose the incorrect statement about insulin
A. It is produced from pancreas

B. It regulates growth and development of the body

C. It regulates blood sugar level

D. Insufficient secretion of insulin will cause diabetes

Answer:
Insulin is a hormone which is produced by pancreas and helps in regulating blood-sugar levels. If it is not secreted in proper amount, the sugar level in the blood rises causing diabetes.

Question 19.
Select the mis-matched pair
A. Adrenaline: Pituitary gland

B. Testosterone: Testes

C. Estrogen: Ovary

D. Thyroxin: Thyroid gland

Answer:
Adrenaline hormone is secreted by adrenal gland whereas growth hormone is secreted by the pituitary gland.

Question 20.

The shape of guard cells changes due to change in the
A. Protein composition of cells

B. Temperature of cells

C. Amount of water in cells

D. Position of nucleus in the cells

Answer:
Guard cells are cells surrounding each stoma. They regulate the opening and closing of the stomata. The shape of guard cells changes due to change in the amount of water in cells.

Question 21.
Which of the following statements about the transmission of nerve impulse is incorrect?
A. Nerve impulse travels from dendritic end towards axonal end.

B. At the dendritic end electrical impulses bring about the release of some chemicals which generate an electrical impulse at the axonal end of another neuron.

C. The chemicals released from the axonal end of one neuron cross the synapse and generate a similar electrical impulse in a dendrite of another neuron.

D. A neuron transmits electrical impulses not only to another neuron but also to muscle and gland cells.

Answer:
Nerve impulse travel from dendritic end towards axonal end. When an electric impulse reaches at the axonal end, it releases some chemicals called neurotransmitter in the synapse. These chemicals cross the synapse and generate a similar electrical impulse in a dendrite of another neuron.

Question 22.
Involuntary actions in the body are controlled by
A. Medulla in forebrain

B. Medulla in midbrain

C. Medulla in hindbrain

D. Medulla in spinal cord

Answer:
Involuntary actions including blood pressure, salivation and vomiting are controlled by medulla in the hindbrain.

Question 23.
Which of the following is not an involuntary action?
A. Vomiting

B. Salivation

C. Heart beat

D. Chewing

Answer:
Involuntary actions are the actions of our body that are not controlled by our will. Vomiting, salivation and heart bear are examples of involuntary action. These involuntary actions are controlled by the medulla in the hindbrain.

Question 24.
When a person is suffering from severe cold, he or she cannot
A. Differentiate the taste of an apple from that of an ice cream

B. Differentiate the smell of a perfume from that of an agarbatti

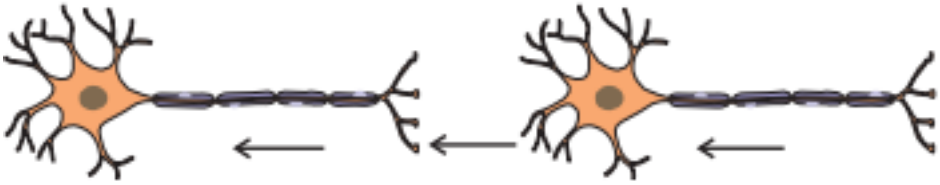
C. Differentiate red light from green light

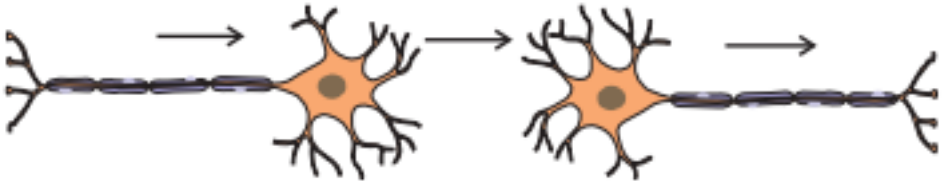
D. Differentiate a hot object from a cold object

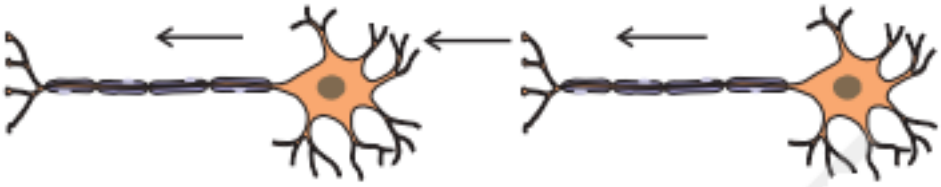
Answer:
Receptors in our body located in sense organs such as ear, nose, eye, etc. These receptors collect information from the external environment and sent these information to the brain where information is interpreted and instructions are sent to organ which revel responses. During cold, mucus membrane of our nose become

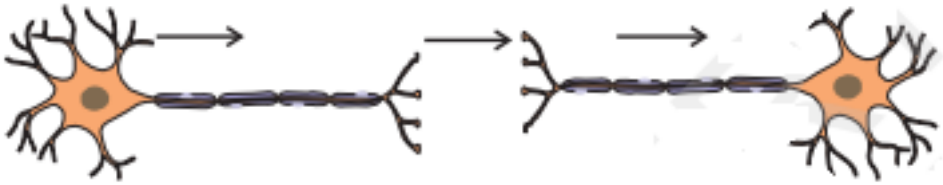
thick that blocks the passage from where odor of perfume reaches the olfactory receptors. Thus, our brain does not receive any message to identify smell of a perfume.

Question 25.
What is the correct direction of flow of electrical impulses?

A. 

B. 

C. 

D. 

Answer:
Direction of flow of electrical impulse.

Impulse → Dendrite → Cell Body → Axon → Release of chemicals that cross synapse → dendrite of next neuron

Question 26.
Which statement is not true about thyroxin?
A. Iron is essential for the synthesis of thyroxin

B. It regulates carbohydrates, protein and fat metabolism in the body

C. Thyroid gland requires iodine to synthesis thyroxin

D. Thyroxin is also called thyroid hormone

Answer:
Iodine is necessary for the thyroid gland to synthesis thyroxine hormone. Thyroxine hormone regulates carbohydrate, protein and fat metabolism in the body so as to provide the best balance for growth. Thyroxine hormone is also known as thyroid hormone.

Question 27.
Dwarfism results due to
A. Excess secretion of thyroxin

B. Less secretion of growth hormone

C. Less secretion of adrenaline

D. Excess secretion of growth hormone

Answer:
Growth hormone is secreted by the pituitary gland. It regulates the growth and development of the body. If there is a deficiency of this hormone in childhood, it leads to dwarfism.

Question 28.
Dramatic changes of body features associated with puberty are mainly because of secretion of
A. Oestrogen from testes and testosterone from ovary

B. Oestrogen from adrenal gland and testosterone from pituitary gland

C. Testosterone from testes and Oestrogen from ovary

D. Testosterone from thyroid gland and Oestrogen from pituitary gland

Answer:

Dramatic changes of body features associated with puberty are mainly because of secretion of testosterone from testes and Oestrogen from ovary.

Question 29.
A doctor advised a person to take an injection of insulin because
A. His blood pressure was low

B. His heart was beating slowly

C. He was suffering from goiter

D. His sugar level in blood was high

Answer:
Insulin is a hormone which is produced by pancreas and helps in regulating blood-sugar levels. If it is not secreted in proper amount, the sugar level in the blood rises causing many harmful effects. So, to regulate blood sugar level in the blood, doctor advise to take an injection of insulin.

Question 30.
The hormone which increases the fertility in males is called
A. Oestrogen

B. Testosterone

C. Insulin

D. Growth hormone

Answer:
Testosterone is a male hormone which increases the fertility in males.

Question 31.
Which of the following endocrine glands is unpaired?
A. Adrenal

B. Testes

C. Pituitary

D. Ovary

Answer:
The pituitary gland is a pea-sized, small and unpaired endocrine gland that is located at the base of the brain, just below the hypothalamus.

Question 32.
Junction between two neurons is called
A. Cell junction

B. Neuro muscular junction

C. Neural joint

D. Synapse

Answer:
Nerve impulse carried out by a gap called synapse between a pair of neurons by means of neurotransmitter. In a synapse, chemical signal is transmitted from axonal end of one neuron to dendritic end of another neuron.

Question 33.
In humans, the life processes are controlled and regulated by
A. Reproductive and endocrine systems

B. Respiratory and nervous systems

C. Endocrine and digestive systems

D. Nervous and endocrine systems

Answer:
In humans, the life processes are controlled and regulated by nervous and endocrine system.

Short Answer Questions

Question 1.
Label the parts (a), (b), (c) and (d) and show the direction of flow of electrical signals in Figure 7.2.

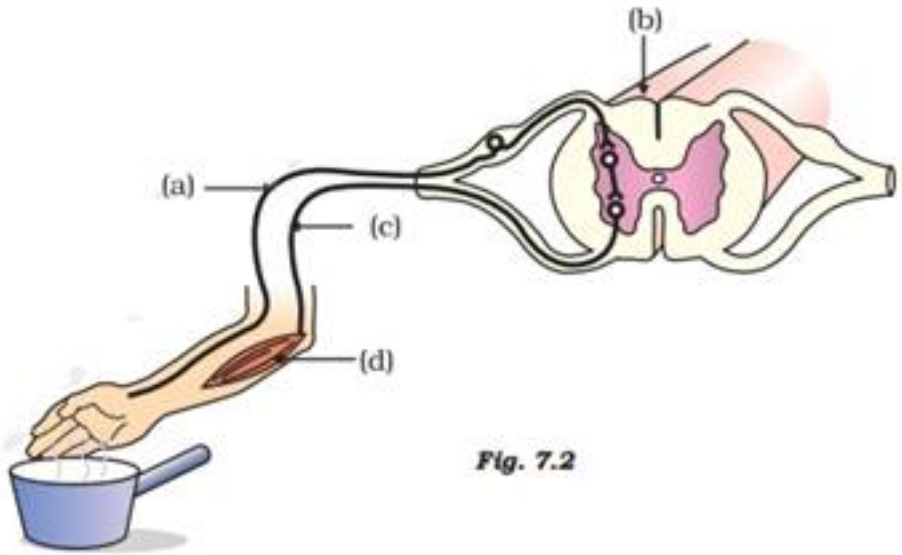


Fig. 7.2

Answer:
(a) Sensory Neuron - Sensory neurons are nerve cells within the nervous system responsible for converting external stimuli from the organism's environment into internal electrical impulses.

(b) Spinal Cord (CNS) - The spinal cord functions primarily in the transmission of nerve signals from the motor cortex to the body, and from the afferent fibers of the sensory neurons to the sensory cortex.

(c) Motor Neuron - A motor neuron (or motoneuron) is a neuron whose cell body is located in the spinal cord and whose fiber (axon) projects outside the spinal cord to directly or indirectly control effector organs, mainly muscles and glands.

(d) Effector = Muscle in Arm - An effector acts in special ways in response to a nerve impulse. In humans, effectors may either be muscles, which contract in response to neural stimuli, or glands, which produce secretions.

Question 2.
Name the plant hormones responsible for the following:

(a) Elongation of cells

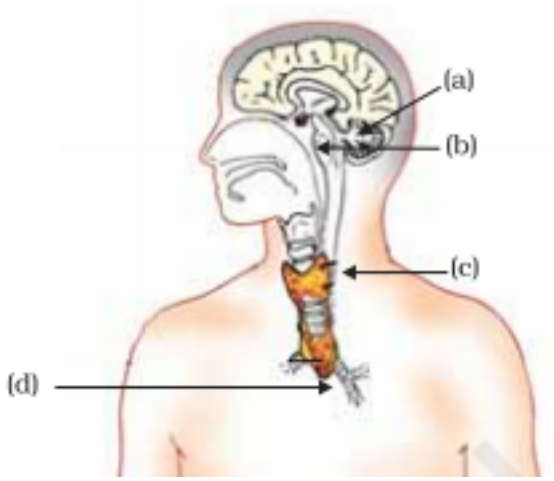
(b) Growth of stem

(c) Promotion of cell division

(d) Falling of senescent leaves

Answer:
(a) Auxin, a plant hormone synthesized at the shoot tip and helps the cell grow longer.
(b) Gibberellin helps in the growth of the stem.
(c) Cytokinin is a plant hormone which promote cell division.
(d) Abscisic acid is a plant growth inhibiting hormone which is responsible for falling of senescent leaves.

Question 3.
Label the endocrine glands in the given figure.



Answer:
(a) Pineal gland

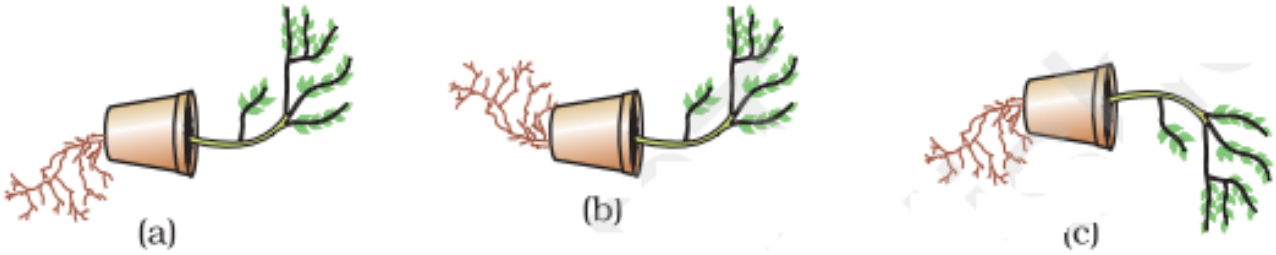
(a) Pituitary gland

(a) Thyroid gland

(a) Thymus

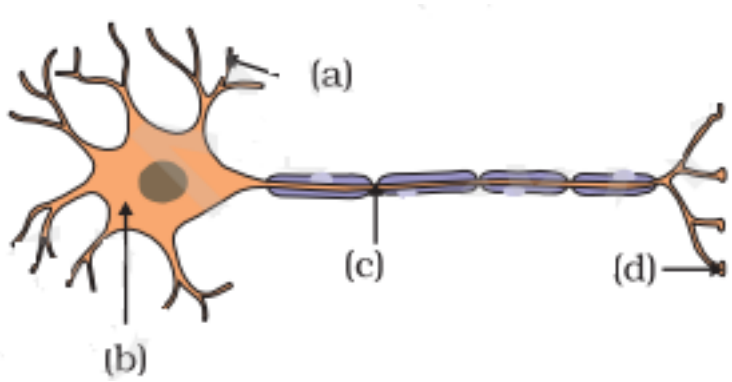
Question 4.

In the given figures, (a), (b) and (c), which appears more accurate and why?



Answer:
The downward movement of roots in response to gravitational force of earth is called geotropism. Plant roots show positive geotropism while shoots show negative geotropism. Thus, in the given figures, Figure (a) appears more accurate because it is showing positive geotropic movement in roots and negative geotropic movement in stem.

Question 5.
Label the parts of a neuron in the given figure.



Answer:
(a) Dendrites (b) Cyton

(c) Axon (d) Axon terminals

Question 6.

Match the terms of Column (A) with those of Column (B)

Column (A)	Column (B)
(a) Olfactory receptors	(i) Tongue
(b) Thermo receptors (temperature receptors)	(ii) Eye
(c) Gustatoreceptors	(iii) Nose
(d) Photoreceptors	(iv) Skin

Answer:
(a) (iii); (b) (iv); (c) (i); (d) (ii)

Question 7.
What is a tropic movement? Explain with an example.

Answer:
The movement of plant part in a particular direction in relation to the stimulus is called tropic movement. These directional or tropic movements can be either towards the stimulus, or away from it. For example; the movement of a plant shoot towards the light is called phototropism.

Question 8.
What will happen if intake of iodine in our diet is low?

Answer:
Iodine is necessary for the thyroid gland to synthesis thyroxine hormone. Thyroxine regulates the metabolisms carbohydrates, proteins and fats in the body. Lack of iodine in the diet can hamper general metabolism; which can lead to many complications. Moreover, deficiency of iodine in our diet also leads to a condition which is known as goiter. One of the symptoms in this disease is a swollen neck.

Question 9.
What happens at the synapse between two neurons?

Answer:

The junction between two neurons is called synapse. Transmission of nerve impulse between two neurons takes place through the synapse by means of neurotransmitter. In a synapse, chemical signal is transmitted from axonal end of one neuron to dendritic end of another neuron.

Question 10.
Answer the following:

(a) Which hormone is responsible for the changes noticed in females at puberty?

(b) Dwarfism results due to deficiency of which hormone?

(c) Blood sugar level rises due to deficiency of which hormone?

(d) Iodine is necessary for the synthesis of which hormone?

(e) Name the endocrine gland associated with brain?

(f) Which gland secretes digestive enzymes as well as hormones?

(g) Name the endocrine gland associated with kidneys?

(h) Which endocrine gland is present in males but not in females?

Answer:
(a) Oestrogen hormone is responsible for the changes noticed in females at puberty.

(b) Dwarfism results due to deficiency of growth hormone.

(c) Blood sugar level rises due to deficiency of Insulin hormone.

(d) Iodine is necessary for the synthesis of Thyroxine hormone.

(e) Pineal Gland, a endocrine gland associated with brain.

(f) Pancreas gland secretes digestive enzymes as well as hormones.

(g) Adrenal Gland, a endocrine gland associated with kidneys.

(h) Testis present in males.

Question 11.
Answer the following :

(a) Name the endocrine gland associated with brain?

(b) Which gland secretes digestive enzymes as well as hormones?

(c) Name the endocrine gland associated with kidneys?

(d) Which endocrine gland is present in males but not in females?

Answer:
(a) Pituitary: Hypothalamus gland present in brain releases hormones that regulate the secretion of pituitary glands.

(b) Pancreas: It is a digestive gland as well as it secretes the pancreatic juice for digestion of food. It also secretes hormones as insulin.

(c) Adrenal: Adrenal glands are located on the top of two kidneys.

(d) Testes: These are the glands which are present only in males and secretes male sex hormone, testosterone.

Long Answer Questions

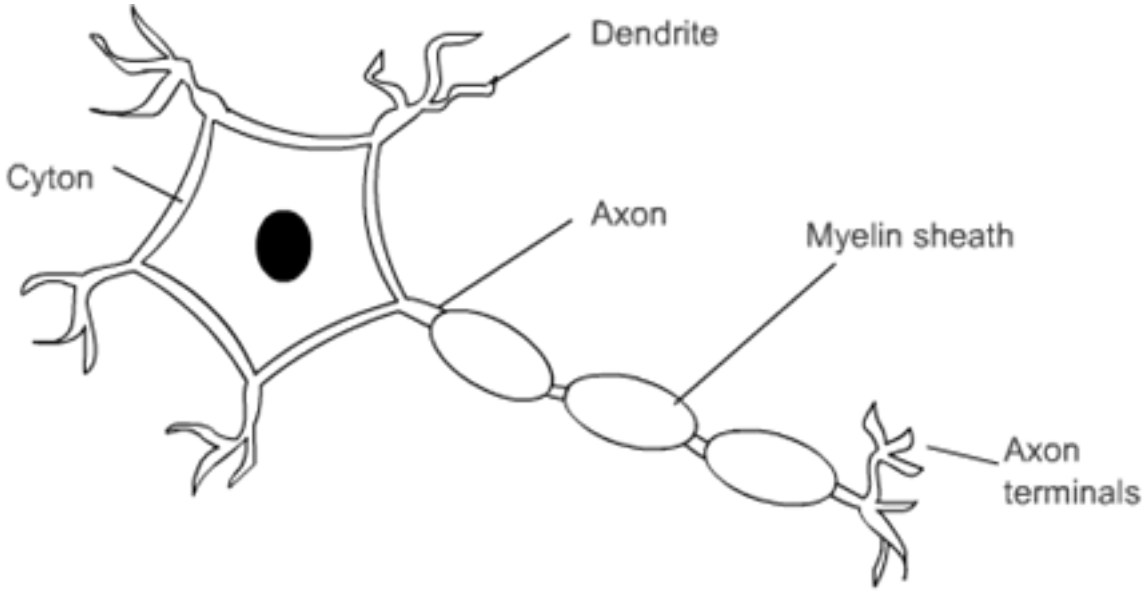
Question 1.
Draw the structure of a neuron and explain its function.

Answer:
Neurons are nerve cells which are the functional units of the nervous system. The three main parts of a neuron are dendrite, cell body and axon.

Dendrite: It detect information and conducts the messages towards the cell body.

Cell body: It contains nucleus, mitochondria, and other cell organelles. It maintains the growth of the cell.

Axon: It conducts messages away from the cell body and pass to the next neuron.



Question 2.
What are the major parts of the brain? Mention the functions of different parts.

Answer:
Brain has three major parts or regions, namely the fore-brain, mid-brain and hind-brain. The major parts of the brain and their functions are as follows:

1. Fore-brain – It is the main thinking part of the brain. It has three main parts- the olfactory lobes, the cerebrum and the diencephalon.

(a) The olfactory lobes – These are a pair of very small club shaped bodies which are fully covered by the cerebrum. They act as a center of smell.

(b) The cerebrum – It is the largest and most prominent part of the brain. It is divided into right and left cerebral hemisphere by a deep groove. It is the center of consciousness, thoughts, memory and analytical thinking. It also controls voluntary actions.

(c) Diencephalon – It mainly consists of pituitary gland, hypothalamus and thalamus. It posses control unit of thirst, hunger, temperature, sleep, etc.

2. Mid-brain – It acts as a coordinating unit between fore-brain and hind-brain. It also controls some involuntary actions.

2. Hind-brain – It has three main centers – Cerebellum, Pons and Medulla oblongata.

(a) Cerebellum- It is responsible for precision of voluntary actions and maintaining the posture and balance of the body.

(b) Pons – It is the center through which nerve impulses travels to and from the cerebellum, spinal cord and other parts of the brain. It also helps in respiration.

(c) Medulla oblongata – It is the lowermost part of the brain. It contains vital centres for controlling blood pressure, respiration, swallowing, sneezing, coughing, salivation and vomiting.

Question 3.
What constitutes the central and peripheral nervous systems? How are the components of central nervous system protected?

Answer:
The central nervous system is composed of the brain and the spinal cord. The peripheral nervous system is composed of cranial nerves arising from the brain and spinal nerves arising from the spinal cord.

Brain is a most important part of the body which needs to be carefully protected. Brain is located inside a bony box called skull. It is covered on the outside by three membranes called meninges. The cerebrospinal fluid files the space between these membranes and provides a cushion against mechanical shocks. Spinal cord gets protection by the vertebral column or backbone. Like the brain, it is also protected by three meninges and cerebrospinal fluid.

Question 4.
Mention one function for each of these hormones:

(a) Thyroxin

(b) Insulin

(c) Adrenaline

(d) Growth hormone

(e) Testosterone

Answer:
(a) Thyroxine hormone regulates carbohydrate, protein and fat metabolism in the body so as to provide the best balance for growth.

(b) Insulin is a hormone which is produced by pancreas and helps in regulating blood-sugar levels.

(c) It prepares the body for 'fight or flight' response.

(d) It regulates the growth and development of the body.

(e) Testosterone hormone triggers sperm production and is responsible for the development of secondary sexual characters in males.

Question 5.
Name various plant hormones. Also give their physiological effects on plant growth and development.

Answer:
There are four types of naturally occurring plant hormones. These are auxin, gibberellins, cytokinin and abscisic acid. The physiological effect of plant hormones on growth and development are as follows:

1. Auxin: It promotes cell elongation and thus promotes growth of a plant part.

2. Gibberellins: Like auxin, it also helps in the growth of the stem.

3. Cytokinin: It promotes cell division and thus promotes growth.

4. Abscisic acid: It Inhibits growth and is responsible for shedding of older parts.

Question 6.
What are reflex actions? Give two examples. Explain a reflex arc.

Answer:
Reflex action - Sudden action in response to something in the environment is called reflex action.

For example- When we touch a hot object, we withdraw our hand immediately without thinking.

Closing of eyes, when bright light is focused show sudden response and do not involve any thinking. These are examples of reflex action.

The path through which signals are transmitted from a receptor to a muscle or a gland is called reflex arc. The following flow chart shows the flow of signal in a reflex arc.

Receptor ⇨ Sensory Neuron ⇨ Relay neuron ⇨ Motor neuron ⇨ Effector (muscle)

Stimulus received by the sensory receptors. The sensory neurons pick signals from the receptor and send them to the relay neuron. The relay neuron is present in the spinal cord. Impulses travels from the spinal cord to the motor neuron. The end of motor neuron connects effector organ or muscles which produce response.

Question 7.
Nervous and hormonal systems together perform the function of control and coordination in human beings." Justify the statement.

Answer:
Nervous and hormonal systems together perform the function of control and coordination in human beings. The nervous system consists of nerves or neurons which controls and coordinates all the functions in the body. Nervous system consists of sensory receptors which collect information from the external environment in the form of stimuli and then sent them to the brain in the form of electric impulse. In the brain, Information is interpreted and instructions are sent to effector organ i.e., muscles which revel responses. Nerves needs assistance from the hormones because they cannot reach each and every part of the body. Coordination in humans is brought about by the secretions of endocrine glands. Endocrine glands are ductless glands which secrete chemical substances called hormones directly into the blood. An organ which responds to such a hormone is known as target organ. Hormonal control is mainly based on feedback mechanism

and tells the body to either pace up or slow down; as per the situation. Nervous control, on the other hand, is more of a direct control. Both of them complement each other. Thus, it can be said that nervous and hormonal systems together perform the function of control and coordination in human beings.

Question 8.
How does chemical coordination take place in animals?

Answer:
Chemical coordination takes place in animals with the help of hormones. Hormones are chemical substances released directly into the bloodstream by the endocrine glands. They regulate the physiological processes in the living organisms. The hormone should be secreted in precise quantities. The amount and timing of hormone released are regulated by a mechanism called feedback mechanisms.

The nervous system along with the endocrine system in our body control and coordinates the physical processes.

Question 9.
Why is the flow of signals in a synapse from axonal end of one neuron to dendritic end of another neuron but not the reverse?

Answer:
The flow of signals in a synapse from axonal end of one neuron to dendritic end of another neuron takes place by the means of specialized chemicals called neurotransmitters. When an electrical signal reaches the axonal end of a neuron, it releases a chemical substance. This chemical diffuses towards the dendrite end of next neuron where it generates an electrical impulse or signal. Hence, the electrical signal is converted into a chemical signal at the axonal end. Hence, the flow of signals in a synapse happens from axonal end of one neuron to dendritic end of another neuron but not in the reverse direction.

Question 10.
Which signals will get disrupted in case of a spinal cord injury?

Answer:
The spinal nerves, a part of peripheral nervous system arises from the spinal cord. In case of spinal cord injury, the signals coming from the nerves as well as the signals coming to the receptors would be disturbed.

Question 11.
What is the function of receptors in our body? Think of situations where receptors do not work properly. What problems are likely to arise?

Answer:
Receptors in our body located in sense organs such as ear, nose, eye, etc. These receptors collect information from the external environment in the form of stimuli and then sent them to the brain in the form of electric impulse. In the brain, Information is interpreted and instructions are sent to effector organ which revel responses. If receptor does not work properly, the environmental stimuli are not able to create any nerve impulse and body does not respond. For example-During cold, mucus membrane of our nose become thick that blocks the passage from where odor of perfume reaches the olfactory receptors. Thus, our brain does not receive any message to identify smell of a perfume.

Question 12.
How does phototropism occur in plants?

Answer:
The growth and movement of a plant shoot towards the light is known as phototropism. Example-The movement of sunflower in the direction of sun is Phototropism. The phototropic movement is generally caused by the plant hormone called auxin. Concentration of auxin changes in a particular plant part, in response to the direction of light. The concentration of auxin increases on the dark side and decreases on the illuminated side. Due to the presence of more auxin, the part of the plant stem which is away from light grows faster, causing it to bend towards light.

Question 13.
How does chemical coordination occur in plants?

Answer:
In plants, chemical coordination occurs by plant hormones. Plant hormones are chemical substances which are produced at specific pare of the plant and then are diffused to other part of the plant. Most of the plant hormones promote growth in certain plant parts, e.g. auxin, gibberellins and cytokinin. Abscisic acid is a plant hormone which inhibits growth. Shedding of leaves or ripe fruits is facilitated by abscisic acid.

Question 14.
What is the need for a system of control and coordination in an organism?

Answer:
The body of multicellular organisms consists of various organs and each is specialized to perform specific functions. Therefore, it is necessary that these organs must be carefully controlled and coordinated for the survival of an organism. In human beings, nervous system and endocrine system work together for control and coordination.

Question 15.
How are involuntary actions and reflex actions different from each other?

Answer:

Involuntary actions	Reflex actions
Involuntary actions are actions which are not controlled by our will.	Sudden action in response to something in the environment is called reflex action.
They are connected with functioning of internal body part	They are connected with response of stimuli.
Example- breathing, heartbeat, etc.	Example- Closing the eyes, when bright light is focused.
They are controlled by medulla of hind-brain.	They are generally controlled by spinal cord.

Question 16.
Compare and contrast nervous and hormonal mechanisms for control and coordination in animals.

Answer:

Nervous mechanism	Hormonal mechanism
Nerves or neurons take part in it.	Glands or secretory cells take part in it.
Message travels very quickly and response is quick.	Message travels slowly and response is slow.
Message travels along the nerves or neurons.	Message transmitted through blood.
Message transferred in the form of electric impulses.	Message transferred in the form of chemicals called hormones.
Its effects are short lived.	It has prolonged effects.

Question 17.

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

Answer:

Movement in sensitive plant	Movement in our legs
It is facilitated by chemical control.	It is facilitated by nervous control.
It occurs in response to an external stimulus like touch, pressure or shock.	It occurs voluntarily in response to our need and will.
It is controlled by plant hormones.	It is control by cerebellum of the hind-brain.