7

Control and Coordination

In the Chapter

- Control and coordination are the functions of the nervous system and hormones present in our bodies.
- The responses of the nervous system can be grouped as reflex action, voluntary action or involuntary action.
- The nervous system uses electrical impulses to send messages.
- The nervous system receives information from our sense organs and acts through our muscles.
- Chemical coordination is found in both plants and animals.
- Hormones produced in one part of an organism move to another part to get the desired effect.
- A feedback mechanism controls the action of the hormones.

Intext Exercises

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1. What is the difference between a reflex action and walking?

Ans. Reflex action is a process by which we do something without thinking about it or without being in control of our reactions. It is done only by the spinal cord without the help of brain.
While walking is a process which is done by thinking or it is performed by the brain unlike reflex action.

2. What happens at the synapse between two neurons?

Ans. The electrical impulses set off the release of some chemicals at the synapse between two neurons. These chemicals cross the synapse and start a similar electrical impulse in a dendrite of the next neuron.

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

Ans. Posture and equilibrium of the body is maintained by midbrain.

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

Ans. The smell of an agarbatti is detected by the forebrain. There are separate areas of association where sensory impulses or information are interpreted by putting them together. These impulses of smell are detected by forebrain.

5. What is the role of the brain in reflex action?

Ans. The nerves from all over the body meet in a bundle in the spinal cord. Reflex arcs are formed in the spinal cord itself although the information input also goes on to reach the brain.

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1. What are plant hormones?

Ans. The chemical substances released by various parts of plants to control the growth and various activities are called plant hormones.

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

Ans. The movement of leaves of the sensitive plant is neither towards nor always from stimulus like touch. While the movement of shoot is towards stimulus like light. The movement of leaves of sensitive plants is not directional while the movement of shoot is directional.

3. Give an example of a plant hormone that promotes growth.

Ans. (i) Auxins help to increase the length of plants.
(ii) Gibberellins help in the growth of stem.

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

Ans. The tendrils are sensitive to touch. As these tendrils come in the contact with the support, the auxin diffuses towards the other side away from the support. So this part grows more rapidly than the other. This causes the tendril to circle around the support and thus climb upwards.

5. Design an experiment to demonstrate hydrotropism.

Ans. Positive hydrotropism can be demonstrated with germinated seedlings which are allowed to grow on ground. The soil below the roots is separated by the polythene partition. The left side is kept moist but the right side is kept dry.
The radicals at first grow in a downward direction due to the effect of gravity (positive geotropism) but after some time, the roots bend toward the moist soil (positive hydrotropism). This is evidently due to the closeness of the germinating roots of water.

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1. How does chemical coordination take place in animals?

Ans. Chemical coordination takes place in animals with the help of some chemical substances called hormones. Hormones are secreted by endrocrine glands. The timing and amount of hormone released are regulated by feedback mechanisms.

2. Why is the use of iodised salt advisable?

Ans. The use of iodised salt is advisable because iodine is necessary for the thyroid gland to produce thryoxine hormone. Thyroxine regulates carbohydrates, protein and fat metabolism in the body so as to provide the best balance for growth. Iodine is essential for the synthesis of thyroxine.

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

Ans. Adrenalin is secreted directly into the blood and is carried to different parts of the body. It acts on heart. As a result, the heart beats faster in order to supply more oxygen to our muscles. These muscles regulate various movements of the body.

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

Ans. The patients of diabetes are treated by giving injections of insulin because insulin is hormone which is produced by the pancreas and helps in regulating blood sugar levels. If it is not secreted in proper amounts the sugar level in the blood rises causing many harmful effects.

Exercise

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.

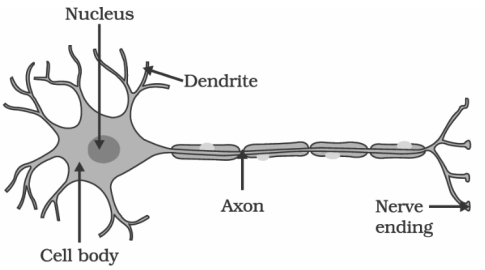
3. The brain is responsible for
(a) thinking.
(b) regulating the heart beat.
(c) balancing the body.
(d) all of the above.

Ans. (d) 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. The main function of receptors is to detect informations from the environment. These receptors are located in our sense organs. There are some situations where receptors do not work properly like mouth starts watering when we feel hungry touching a flame, knee-jerk, etc.
In these situations, they take enough time if these are done by the brain. To solve these problems, the nerves move muscles in a simpler way. This is done by the spinal cord.

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



Ans. Function of neuron : The neuron is the structural and functional unit of the nervous system. It contains the following three parts :
(i) Dendrites (ii) Cell body (iii) Axon.
The impulses of information travel from dendrites to cell body, and then along the axon to its end. These impulses cross the synapse. At the end, the impulses travel from one neuron to the other up to the spinal cord or to the concerned part of body.

6. How does phototropism occur in plants?

Ans. The directional or tropic movement towards the light or away from the light is called phototropism. The shoots respond by bending towards light, while roots respond by bending away from the light.

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

Ans. (i) All the signals and responses which pass from and to the brain through the spinal cord will get disturbed.
(ii) Reflex actions will be disrupted.

8. How does chemical coordination occur in plants?

Ans. In plants, stimulated cells release chemical compounds, which are called plant hormones. Different plant hormones help to coordinate growth development and responses to the environment. They are synthesised at places away from where they act and simply diffuse to the area of action.

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

Ans. A system of control and coordination in an organism is essential for the following :
(i) to give response to external stimuli.
(ii) for survival.
(iii) for interaction between the environment and individual himself.

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

Ans. Involuntary Action : (i) The action which we cannot do by thinking is called involuntary

action. For example, beating of the heart.
(ii) Involuntary actions are controlled by the brain.
Reflex Action : (i) An action, i.e., a response which is immediate (spontaneous) and does not need processing by the brain is called a reflex action. For example, immediate removal of hand on touching a hot plate.
(ii) Reflex actions are controlled by the spinal cord.

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

Ans. In human beings, the nervous system controls the various functions by small units called neurons. Neurons receive the information through sensory nerves and transfer them through motor nerves.
Besides this, certain important functions like sugar level metabolism, growth and development, etc., are controlled by hormones secreted by various endocrine glands. Hence, it is true that nervous and hormonal systems together perform the function of control and coordination in human beings.

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

Ans. The movement in the sensitive plant is Haptonastic and non-directonal whereas movement in our legs is voluntary and they work according to our will.

Additional Questions

1. (i) What is the function of dendrites?
(ii) Mention the receptors for light and sound in animals.

Ans. (i) Dendrites acquire the information.
(ii) **Receptors for light-**Photoreceptors (Eyes)
Receptors for sound-Phonoreceptors (Ears).

2. What is reflex action ?

Ans. Reflex action. It is sudden spontaneous, mechanical, involuntary response to astimulus by voluntary organs.

3. Give two examples of reflex action.

Ans. (i) Closing of eyes in response to bright light.
(ii) Withdrawal of hand in case you touch a hot plate.

4. Name three parts of neurons in complex reflex arc.

Ans. A complex reflex arc is composed of afferent, connector and efferent neurons.

5. What is a neuron ?

Ans. Neuron is a structural and functional unit of nervous system. It is the largest cell of body. It has three components i.e. (i) cell body (ii) dendrites (iii) axon.

6. Name the largest cell present in human body.

Ans. Neuron.

7. What are the three basic regions of the brain ?

Ans. Fore brain, Mid brain, Hind brain.

8. Which part of the brain controls the heart ?

Ans. Medulla oblongata.

9. Which part of the plant shows positive geotropism and why?

Ans. The main roots of plants show positive geotropism due to differential growth caused by unequal distribution of auxins.

10. What are turgor movements?

Ans. The turgor movements are based on the turgor pressure of the cells. These movements are

caused by reversible changes in the cell size. Thus volume changes in the cells result in movements.

11. What is the effect of light on seedling?

Ans. Light is essential for proper growth and in proper light they remain stout and green. Generally seedlings growing in dark become etiolated.

12. What is meant by term 'tropism'? Give examples.

Ans. These are plant growth responses to different stimuli governed by auxins. Response to touch (thigmotropism), gravity (geotropism) and light (phototropism) are examples.

13. Define hydrotropism and chemotropism.

Ans. Hydrotropism. It is the movement of plant organs in response to unilateral stimulus of water.

Chemotropism. It is the response of plants towards chemicals.

14. Name the following:

(i) Two types of glands present in our body.

(ii) The types of glands that secrete hormones.

(iii) The gland which functions both as exocrine and endocrine gland.

(iv) The other name of hormones.

(v) The gland which is called 'Master gland'.

(vi) The two hormones secreted by posterior lobe of pituitary.

Ans. (i) Exocrine glands and endocrine glands

(ii) Endocrine glands or ductless glands

(iii) Pancreas

(iv) Chemical coordinators (messengers)

(v) Pituitary gland

(vi) Oxytocin and Vasopressin or ADH

15. Name the following:

(i) The hormone of the pituitary gland which controls the activity of thyroid.

(ii) The hormone of the pituitary gland which controls the activity of adrenal gland.

(iii) The part of the pituitary gland which controls growth and development of gonads.

(iv) The hormone that promotes the growth in our body.

(v) The disease caused by the deficiency of growth hormone in children.

(vi) The disease caused by the oversecretion of growth hormone in children.

Ans. (i) Thyroid Stimulating Hormone (TSH)

(ii) Adreno Corticotropic Hormone (ACTH)

(iii) Anterior lobe (Adenohypophysis)

(iv) Growth hormone.

(v) Dwarfism

(vi) Gigantism.

16. Name the following:

(i) Anyone symptom of acromegaly.

(ii) The hormone associated with lactation in mammals.

(iii) The hormone which controls the water exchange in the renal tubules.

(iv) The hormone secreted by thyroid gland.

(v) The disease caused by the deficiency of iodine.

(vi) The diseases caused by the malfunctioning of thyroid gland.

Ans. (i) Thickness of bones

(ii) Luteotropic hormone
(iii) Antidiuretic Hormone (AD H)
(iv) Thyroxine
(v) Cretinism
(vi) Cretinism and Myxoedema.

17. Which mineral is necessary for secretion of thyroxine?

Ans. Iodine.

18. Name the following:
(i) The cause of diabetes mellitus.
(ii) The two portions of adrenal gland.
(iii) The gland which functions actively in emergency situations.
(iv) The hormone of pituitary that helps in child birth.
(v) The endocrine gland located on the top of kidneys.
(vi) The gland which secretes insulin.

Ans. (i) Deficiency of insulin
(ii) Adrenal cortex and adrenal medulla
(iii) Adrenal medulla
(iv) Oxytocin
(v) Adrenal gland
(vi) Pancreas.

19. Name the following:
(i) The hormone which prepares the body to meet any emergency situation.
(ii) An example of the disease caused due to insufficient secretion of thyroxine.
(iii) The gland, which produces the so called 'emergency hormone'.
(iv) Carrier of hormones from the gland to target organ.
(v) The hormone which controls (i.e. reduces) the level of sugar in blood, and the gland which secretes it.

Ans. (i) Adrenaline
(ii) Cretinism
(iii) Adrenal
(iv) Blood
(v) Insulin, Pancreas.

20. Write the function of hormone 'thyroxine' in our body.

Ans. It regulates metabolism of carbohydrates, fats and proteins.

21. Which organ secretes a hormone when the blood sugar rises. Name a digestive enzyme released by this organ.

Ans. (i) Pancreas releases insulin hormone.
(ii) Trypsin enzyme.

22. List the components of Nervous system.

Ans. Nervous system
It consists of central nervous system, peripheral nervous system and autonomic nervoussystem.
Central nervous system. It consists of brain and spinal cord. It is the main controlling centre of the body.
Peripheral nervous system. It consists of cranial and spinal nerves.
The autonomic nervous system consists of a special set of peripheral nerves that innervateorgans like heart, lungs, digestive tract.
The autonomic nervous system can be divided into two divisions:

(a) Sympathetic system. (b) Parasympathetic nervous system.

23. What is the role of nervous system in the body?

Ans. Role of the nervous system

1. The nervous system regulates the activities of different organs and of the entire organism as it has thinking power.
2. The nervous system links the various organs, systems and co-ordinates all their activities. It ensures the integrity of the organism.
3. The unity of organism and its internal environment is affected through the nervous system.
4. Human brain is the material basis of thinking and speech.

Thus nervous system is meant to control and co-ordinate the various activities of different parts.

24. What is synapse? Explain what are its kinds?

Ans. Synapse. Synapse is the close proximity of the axon of one neuron and the dendrite or cyton of another neuron with a gap. In a synapse, the transmitting cell is called the presynaptic cell, and the receiving cell is termed the postsynaptic cell. A narrow gap called synaptic cleft, separates the presynaptic cell from the postsynaptic cell. Hence, an action potential occurring in the membrane of the presynaptic cell cannot be directly transmitted to the membrane of the postsynaptic cell.

25. What are hormones ? Name the hormone secreted by thyroid and state its function.

Ans. (i) Hormones are the chemical messengers which regulate various metabolic activities. Hormones produced in one part of an organism move the another part to achieve the desired effect.

(ii) Hormone secreted by thyroid is thyroxin.

Function of thyroxin : It regulates carbohydrates, protein and fat metabolism in the body so as to provide the best balance for growth.

26. Name the hormone secreted by human testes. State its functions.

Ans. (i) Testosterone

(ii) Functions :

(a) It is responsible for the formation of sperms.

(b) It causes changes in the appearance of body at the time of puberty.

27. Name and explain the function of the hormone secreted by the pituitary gland in humans.

Ans. (i) Growth hormone.

(ii) It regulates growth and development of body.

28. What is tropic movement ? Explain with an example.

Ans. The directional growth movement of plants due to external stimuli are called tropic movement. It can be either towards the stimulus, or away from it. For example, in case of phototropic movement, shoots respond by bending towards light while roots respond by bending away from it.

29. What are 'nastic' and 'curvature' movements ? Give one example of each.

Ans. Nastic movements : These are non-directional movements which are neither towards nor away from the stimulus. Example: Dropping of leaves.

Curvature movements : In such movements plants organs move towards or away from the stimulus. Example : Bending of shoot towards source of light (phototropism) and movement of root away from the source of light (geotropism).

30. Explain the mechanism of reflex action with a suitable example.

Ans. When we touch a hot object the stimulus passes through sensory nerve to spinal cord.

From here the motor nerves bring the order to the muscle of hand (effector) and hand is removed from the hot object within a fraction of time. This pathway of reflex action is termed reflex arc.

31. Why Mimosa pudica (touch-me-not) leaves drop down when touched ?

Ans. It is due to turgor pressure difference between the upper and lower halves of the base of petiole (pulvinus). Lower half cells loses water and upper half cells of pulvinus become turgid due to transfer of water from lower cells. Thus, the entire leaf drops down when touched.

32. How auxin helps in bending of stem towards light (phototropism) ?

Ans. When growing plants detect light, a hormone called auxin, synthesised at the shoot tip, helps the cells to grow longer. When light is coming from one direction of the plant, auxin diffuses towards the shady side. This concentration of auxin stimulates the cells to grow longer on the side of the shoot which is away from light. Thus , the plant appears to bend towards light.

33. How information passes through neurons ?

Ans. Information passes through the neurons in the form of chemical and electrical signals called nerve impulse. These nerve impulses are carried by dendrites towards the cell body. Then these impulses are conducted away from the cell body by axons to another nerve cell at synapse.

34. Define hormones. Names the hormone secreted by thyroid. Write its function. Why is the use of iodized salt advised to us ?

Ans. Hormones are the chemical messengers that regulate the biological processes in the living organisms. Hormones are secreted by endocrine glands and they act on the specific by thyroid. Thyroxin regulates carbohydrate, protein and fat metabolism in the body so as to provide the best balance for growth. Iodine is essential for the synthesis of thyroxin.

35. What is the significance of reflex action ?

Ans. Reflex actions are significant because :

(i) They are spontaneous in response to any harmful stimulus thereby protecting from the harm that could be done if delayed.

(ii) These relieve the burden of brain by automatically responding to routine stimuli.

36. What is meant by hydrotropism ? Give an example.

Ans. The responses of a plant towards water is called hydrotropism. The roots of plants show hydrotropism and they show positive hydrotropism.

37. Name any three receptors in human beings and write their functions.

Ans. (i) Olfactory receptors will detect smell

(ii) Gustatory receptors will detect taste.

(iii) Photo receptors will detect light

38. 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 ?

Ans. When an electrical signal reaches the axonal end of a neuron, it release 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. Since these chemicals are absent at the dendrite end of the neuron, the electrical signal cannot be converted into chemical signal.

39. Define 'hormones'. Name the hormone secreted by thyroid. Write its function. Why is the use of iodised salt advised to us?

Ans. Hormones are the chemical messengers that regulate the biological processes in the living organisms. Hormones are secreted by endocrine glands and they act on the specific organs called target organs. Thyroxin is secreted by thyroid. Thyroxin regulates carbohydrate,

protein and fat metabolism in the body so as to provide the best balance for growth. Iodine is essential for the synthesis of thyroxin.

40. What is the role of the brain in reflex action ?

Ans. Some of the reflex actions are not controlled by the spinal cord and these are controlled by the brain. Although these responses also do not need the process of thinking involved.

Example : Watering of the mouth on smelling or seeing a favourite food. Some other such reflex actions are blinking of the eyes, sneezing and vomiting.

Such a set of muscle movements over which we do not have any thinking conrol are involuntary actions. All these actions are controlled by the medulla part of hind brain.

41. Nervous and hromonal system together perform the function of control and coordination in human beings. Justify the statement.

Ans. Nervous and hormonal system together perform the function of control and coordination in human beings. Let us take an example, in the case of any emergency, stimulus is being perceived by CNS (nervous system). The stimulus is analysed and the response is sent to the effectors. Simultaneously, sympathetic nerves stimulate adrenal glans to release adrenaline which regulates blood pressure, increase heartbeat, constricts blood vessels and dilates pupil, etc. So both nervous and endocrine systems interact and overcome the crisis together.

42. What are dual glands ? Give their examples and functions.

Ans. Dual glands are those which perform two types of functions in our body. They secrete some hormones for control and coordination and also help in some other activity of our body.

Example : Testes, ovaries and pancreas.

Functions : Pancreas secretes digestive juice for digestion of food. It also controls the sugar level of the blood with its insulin hormone.

Testes produce male gametes (sperms) and also produce testosterone hormone which control behaviour in the male human beings.

. Ovaries produce female gametes (egg cells) and also produce pestrogen and progestrone hormones to control various sxual characters and sexual behaviour in the female human beings.

43. How are involuntary action and reflex action different from each other?

Ans. Involuntary actions are these which we cannot control even if we want to do so. There is not stimulus involved in the involuntary actions. They take place on their own. For example, our heart beats all the time without our thinking about it. Therefore, the beating of heart is purely involuntary action. The reflex action is also a kind of involuntary action but it takes place in response to a stimulus. For example, the decrease in the size of the pupil of our-eye on stepping out in bright light is a reflex action which takes place in response to a stimulus light.

44. What is dormancy ? Explain with the help of two examples.

Ans. Dormancy is the stage where the metabolism of the body almost stops. It is also known as the inactive or resting condition. The seed of plant is dormant or has dormancy on its own. To break dormancy, a seed must have certain conditions like water, warmth, air and hormones. As the seed gets all these conditions, the dormancy breaks and the seed starts germination to form a seedling.

The bud of a plant also has dormancy. After the breaking of dormancy, the bud can form a branch, leaf or a flower. The breaking of dormancy of a bud requires certain plant hormones.

Multiple Choice Questions

1. In one second, nerve impulse travels in certain human nerves about :
(a) 121 metres (b) 221 metres
(c) 321 metres (d) 100 metres.
Ans. (a) 121 metres

2. A nerve impulse leaves a neuron via the :
(a) Dendrites (b) Cyton
(c) Axon (d) Nucleus.
Ans. (c) Axon

3. Which one of the following hormones is associated with seed maturation ?
(a) IAA (b) ABA
(c) Ethylene (d) Kinetin.
Ans. (b) ABA

4. Which one of the following pairs is correctly matched?
(a) Auxin-cell division
(b) Gibberellin-internodal elongation
(c) Cytokinin-fruit ripening
(d) Ethylene-apical dominance.
Ans. (a) Auxin-cell division

5. Which of the following is not hormone?
(a) GA3 (b) Ethylene
(c) Phytochrome (d) Auxins.
Ans. (c) Phytochrome

6. Cytokinins stimulate the cell for:
(a) Turgor (b) Elongation
(c) Cell division (d) Wall thickening.
Ans. (c) Cell division

7. Which of the following hormone is concerned chiefly with root initiation ?
(a) IBA (b) GA3
(c) ABA (d) Kinetin.
Ans. (a) IBA

8. Cytokinins are known to :
(a) inhibit cytoplasmic movement
(b) help in retention of chlorophyll
(c) influence water movement
(d) promote abscision layer formation.
Ans. (b) help in retention of chlorophyll

9. Movement in the leaf of the Touch-me-not (Mimosa) plant is :
(a) Epinasty (b) Hyponasty
(c) Nyctinasty (d) Seismonasty.
Ans. (d) Seismonasty.

10. Plants bend towards light due to accumulation of which hormone?
(a) Auxin (b) Gibberellin
(c) Cytokinin (d) Zeatin.
Ans. (a) Auxin

11. Apical dominance in plant growth is caused by :
(a) auxins

(b) photoperiodism
(c) cytokinin
(d) high rate of photosynthesis.

Ans. (a) auxins

12. Which one of the following is not endocrine glands?
(a) Pituitary (b) Thyroid
(c) Adrenal (d) Salivary.

Ans. (d) Salivary.

13. The secretions of endocrine glands are called as :
(a) juices (b) solutions
(c) hormones (d) excretions.

Ans.(c) hormones

14. Which one of the following is not an endocrine gland?
(a) Adrenal gland (b) Pituitary body
(c) Prostate gland (d) Thyroid gland.

Ans. (c) Prostate gland

15. The hormone which stimulates milk production in mammal is known as :
(a) glucagon (b) prolactin
(c) progesterone (d) oestrogen.

Ans. (b) prolactin

16. Which of the following substances is released in excess quantity during excitement ?
(a) Cortisone (b) Serotonin
(c) Adrenaline (d) Norepinephrine.

Ans. (c) Adrenaline

17. 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 detect smell.

Ans. (a) Gustatory receptors detect taste while olfactory receptors detect smell.

18. In a neuron, conversion of electrical signal to a chemical signal occurs at
(a) cell body (b) axonal end
(c) dendritic end (d) axon

Ans. (b) axonal end

19. Posture and balance of the body is controlled by
(a) cerebrum (b) cerebellum
(c) medulla (d) pons

Ans. (b) cerebellum

20. Spinal cord originates from
(a) cerebrum (b) medulla
(c) pons (d) cerebellum

Ans. (b) medulla

21. The movement of shoot toward light is
(a) geotropism (b) hydrotropism
(c) chemotropism (d) phototropism

Ans. (d) phototropism

22. The main function of abscisic acid in plants is to

(a) increase the length of cells
(b) promote cell division
(c) inhibit growth
(d) promote growth of stem

Ans. (c) inhibit growth

23. Which of the following is not associated with growth of plant ?

(a) Auxin (b) Gibberellins
(c) Cytokinins (d) Abscisic acid

Ans. (d) Abscisic acid

24. Iodine is necessary for the synthesis of which hormone?

(a) Adrenaline (b) Thyroxin
(c) Auxin (d) Insulin

Ans. (b) Thyroxin

25. 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

Ans. (c) amount of water in cells

26. The growth of pollen tubes towards ovules is due to

(a) hydrotropism (b) chemotropism
(c) geotropism (d) phototropism

Ans. (b) chemotropism

27. The movement of sunflower in accordance with the path of sun is due to

(a) phototropism (b) geotropism
(c) chemotropism (d) hydrotropism

Ans. (a) phototropism

28. Which of the following statements about 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 transmit electrical impulses not only to another neuron but to muscle an gland cells.

Ans. (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.

29. Involuntary actions in the body are controlled by

(a) medulla in fore brain
(b) medulla in mid brain
(c) medulla in hind brain
(d) medulla in spinal brain

Ans. (c) medulla in hind brain

30. Which of the following is not an involuntary action ?

(a) Vomiting (b) Salivation
(c) Heart beat (d) Chewing

Ans. (d) Chewing

31. 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
Ans. (c) differentiate the smell of a perfume from that of an *agarbatti.*

32. 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
Ans. (b) Less secretion of growth hormone

33. 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 goitre
(d) his sugar level in blood was high
Ans. (d) his sugar level in blood was high

34. The hormone which increases the fertility in males is called
(a) oestrogen (b) testosterone
(c) insulin (d) growth hormone
Ans. (b) testosterone

35. Which of the following endocrine glands is unpaired ?
(a) Adrenal (b) Testes
(c) Pituitary` (d) Ovary
Ans. (c) Pituitary

36. Junction between two neurons is called
(a) cell junction
(b) neuro muscular junction
(c) neural joint
(d) synapse
Ans. (d) synapse