CHAPTER 7

Control and Coordination

1. OBJECTIVE QUESTIONS

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

   Ans : (b) help in retention of chlorophyll

2. Brain stem is formed by the union of:
   (a) optic lobes
   (b) cerebellum with optic lobes
   (c) corpora striata
   (d) none of the above

   Ans : (d) none of the above

3. The pineal body is considered as:
   (a) an endocrine gland
   (b) an organ concerned with voluntary actions
   (c) an organ concerned with vision
   (d) a vestige of third eye and endocrine gland

   Ans : (d) a vestige of third eye and endocrine gland

4. Autonomic nervous system control
   (a) reflex action (b) sense organs
   (c) internal organs (d) skeletal muscle

   Ans : (c) internal organs

5. Which of the following acts both as Endocrine (ductless) and Exocrine (with duct) gland?
   (a) pancreas (b) liver
   (c) adrenal (d) kidney

   Ans : (a) pancreas

6. Which part of the human brain controls body temperature?
   (a) Pituitary (b) Diencephalon
   (c) Hypothalamus (d) None of these

   Ans : (c) Hypothalamus

   Hypothalamus controls and regulates temperature of body, urge of eating, drinking, sleeping, etc.

7. Coordination via the nervous system tends to differ from that produced by the endocrine system because the nervous system:
   (a) is quick, precise and localized
   (b) is slower and more pervasive
   (c) does not require conscious activity
   (d) has long-lasting effects

   Ans : (a) is quick, precise and localized

8. Growth of pollen tube towards ovule during fertilisation is an example of
   (a) phototropism (b) geotropism
   (c) chemotropism (d) hydrotropism

   Ans : (c) chemotropism

   Growth of pollen tube towards ovule during fertilisation is an example of chemotropism.

9. Which part of the human brain is most well-developed?
   (a) Forebrain (b) Hindbrain
   (c) Diencephalon (d) None of these

   Ans : (a) Forebrain

   Forebrain or cerebrum is the most well-developed part of the human brain.

10. An action potential traveling along an axon:
    (a) moves rapidly in both directions.
    (b) moves faster than a neurotransmitter.
    (c) is slowed by myelin.
    (d) travels through the blood.

    Ans : (b) moves faster than a neurotransmitter.

11. Which of the following comments applies to the brains of most animals?
    (a) Within the brain, neurons exchange information with one another.
    (b) Brains usually lie as near as possible to the important sensory structures in an animal.
    (c) Brains send action potentials to the hindmost portion of the animal by means of major nerves.

(d) All of the above

Ans : (d) All of the above

12. Female sex hormone is termed as

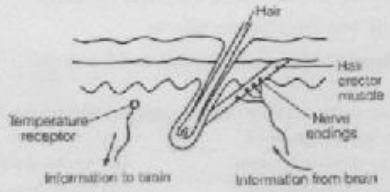
(a) androgen (b) insulin

(c) oestrogen (d) None of these

Ans : (c) oestrogen

Oestrogen is a female sex hormone.

13. The given diagram shows some of the features of human skin.



which part of the brain coordinates the information labelled in the diagram?

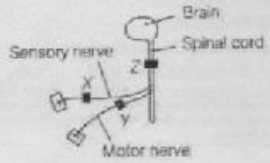
(a) Medulla (b) Hypothalamus

(c) Cerebrum (d) Cerebellum

Ans : (b) Hypothalamus

Hypothalamus is responsible for the regulation of body temperature and osmotic pressure in blood. It uses the negative feedback control mechanism. The hypothalamus acts like a thermostat by sending the changes in body temperature. It sends out signals to different body parts with mechanisms to control and adjust the temperature.

14. The diagram shows the central nervous system, which has been blocked in three different places by a drug used as an anaesthetic.



Three men had on anaesthetic block at X, Y or Z. One of the men can move his leg in response to a pinprick, but does not feel it. Where is the anaesthetic block in this man?

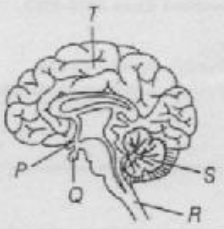
(a) At X (b) At Y

(c) At Z (d) No block

Ans : (c) At Z

Response to a pin prick is a reflex action, but the pain is felt by brain. Hence the block at Z stops feeling in the brain.

15. Observe the figure given below. In the figure, some parts are labelled as P, Q, R, S and T. Given below are functions associated with these parts.



Parts of brain	Functions
P	Master hormone producers
Q	Controls body temperature
R	Controls unconscious activities
S	Helps to control balance
T	In conscious behaviour

which part of the brain is matched with incorrect function?

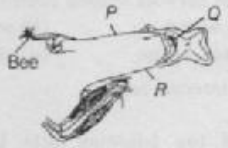
(a) P and S (b) P, Q and T

(c) R and T (d) P, R and T

Ans : (b) P, Q and T

Part P (hypothalamus) controls body temperature. Part Q (pituitary) is the master hormone producer. Part T helps in memory storage and conscious behaviour.

16. The diagram shows a reflex arc in which a bee sting causes the arm to be moved quickly.



If the relay neurone is damaged, how will the transmission of nerve impulses in the reflex arc be affected?

(a) Impulses cannot pass from $P - Q$

(b) Impulses cannot pass from $P - R$

(c) Impulses cannot pass from $Q - P$

(d) Impulses cannot pass from $R - Q$

Ans : (b) Impulses cannot pass from $P - R$

P is the sensory neurone, Q is relay neurone and R is motor neurone. If Q damaged, then nerve impulse cannot pass from P to R.

17. Adrenaline hormone is secreted in the body during emergency situations. What would be the effects of

increased concentration of adrenaline on body?

	Concentration of glycogen in the liver	Concentration of glucose in the blood
(a)	Decrease	Increase
(b)	Increase	Increase
(c)	No effect	Decrease
(d)	Increase	No effect

Ans : (a)

Adrenaline is secreted by body during fight or flight response. It increases the blood glucose level. This happens by increasing the rate of breakdown of glycogen to glucose in the liver and muscles.

18. A child is frightened by a loud noise and shouts for help. In which order, the different types of neurons involved will act?

(a) Motor neurone ⟶ Relay neurone ⟶ Sensory neurone

(b) Motor neurone ⟶ Sensory neurone ⟶ Relay neurone

(c) Sensory neurone ⟶ Motor neurone ⟶ Relay neurone

(d) Sensory neurone ⟶ Relay neurone ⟶ Motor neurone

Ans : (d) Sensory neurone ⟶ Relay neurone ⟶ Motor neurone

The sensory neurone transmits impulses produced by a stimulus detected by the sensory organ to the spinal cord. The relay neurone helps to transfer these impulses to the motor neurone.

The motor neurone transmits the impulses in receives to an appropriate effector. This produces the required response to the stimulus.

19. Following are certain reflex actions occurring in our body.

1. Moving to the side of road when a speeding car approaches.
2. Closing of eyes in response to a sudden bright light.
3. Shouting when we are suddenly disturbed or get scared
4. Withdrawing hands on touching a hot surface.

The reflex arc given below, will be occurring for,

5. Receptors (sense organs) $\xrightarrow{\text{Sensory neurons}}$ Spinal cord $\xrightarrow{\text{Motor neurons}}$ Targets/effectors

(a) 1 and 2 (b) 1, 2 and 3

(c) 1, 2, 3 and 4 (d) 2 and 4

Ans : (c) 1, 2, 3 and 4

The reflex arc occurring is common to all these responses. The stimulus is received by sense organs and sent through sensory neurons to spinal cord. The information is processed and forwarded *via* motor neurone to effector organs.

20. In comparison with other cells, nerve cells show a higher degree of:

(a) Metabolism (b) Growth

(c) Contractility (d) Irritability

Ans : (d) Irritability

21. The photoreceptor cells of the eye are located in the:

(a) Sclera (b) Iris

(c) Retina (d) Optic nerve

Ans : (c) Retina

22. Which of the following receptors is incorrectly paired with what is senses?

(a) Chemoreceptors-chemicals

(b) Photoreceptors-pain

(c) Thermoreceptors-heat

(d) Nociceptors-pain

Ans : (b) Photoreceptors-pain

23. The role of the axon is to

(a) integrate signals from the dendrites

(b) release neurotransmitter

(c) conduct the action potential to the synaptic terminal

(d) synthesize cellular components

Ans : (c) conduct the action potential to the synaptic terminal

24. The major hormones involved in the maintenance of blood glucose levels are produced by the:

(a) Liver (b) Pancreas

(c) Spleen (d) Gall bladder

Ans : (b) Pancreas

25. Breathing rate in mammals is controlled by a part of the brain called the:

(a) Thalamus (b) Hypothalamus

(c) Medulla oblongata (d) Cerebellum

Ans : (c) Medulla oblongata

26. The natural plant hormones were first isolated from:

(a) cotton fruits, spinach leaves, rice plant

(b) avena coleoptile, spinach leaves, fungus Gibberella

(c) corn germ oil, human urine

(d) human urine, rice plant

Ans : (b) avena coleoptile, spinach leaves, fungus Gibberella

27. A high concentration of synthetic auxins is generally used for:

(a) weed control

(b) enhancing root initiation

(c) controlling of cell enlargement

(d) preventing the growth of the lateral buds

Ans : (a) weed control

28. In reflex action, the reflex arc is formed by:

(a) brain ⟶ spinal cord ⟶ muscles

(b) receptor ⟶ spinal cord ⟶ muscles
(c) muscles ⟶ receptor ⟶ brain
(d) muscles ⟶ spinal cord ⟶ receptor
Ans : (b) receptor ⟶ spinal cord ⟶ muscles

29. Which controls the balance of human body?
(a) cerebrum (b) cerebellum
(c) optic lobes (d) spinal cord
Ans : (b) cerebellum

30. In our body, calcium and phosphorus ions are controlled by:
(a) thyroid gland (b) pituitary gland
(c) adrenal gland (d) parathyroid gland
Ans : (c) adrenal gland

31. Hormone from thyroid gland is:
(a) thyroxine (b) thyrodine
(c) parathyroxin (d) thyroprotein
Ans : (a) thyroxine

2. FILL IN THE BLANK

1. A feedback mechanism regulates the action of the ..... .
Ans : hormones

2. ..... hormone is applied to cuttings to induce root initiation in horticulture.
Ans : Auxin

3. ..... movements are growth movements of plants in response to a stimulus from a specific direction.
Ans : Tropic

4. Receptors are structures which are able to detect ..... .
Ans : stimuli

5. Neurons that carry information to an effector are called ..... neurons.
Ans : motor

6. A hormone is a chemical secreted by an .....
Ans : endocrine gland

7. The initial depolarization of the nerve cell membrane.
Ans : sodium

8. The ..... of the neuron secretes the neurotransmitter substance.
Ans : axon

9. Touch me not shows ..... movement.
Ans : nastic

10. Temporal lobe of cerebrum is region for ..... reception.
Ans : auditory

11. Motor nerves transmit response from ..... organs to ..... nervous system in the form of impulse.
Ans : sensory, central

12. ..... and ..... show thermonastic movements.
Ans : Tulips, crows

13. The functional junction between two neurons is called ..... .
Ans : synapse

14. The response of a plant to a stimulus of water is called .....
Ans : hydrotropism

15. Coordination in plants take place by means of chemical substance called ..... .
Ans : phytohormone

16. Endocrine glands secrete their secretion in ..... .
Ans : blood

17. Reflex are formed in spinal cord also sends information input to ..... .
Ans : brain

18. ..... coordinates the activity of picking up pencil for writing.
Ans : cerebellum

19. Positive geotropism of root is due to greater growth on ..... side as compared to ..... side.
Ans : upper, lower

20. Human growth hormone regulates the many body processes involved in ..... and .....
Ans : growth, development

21. The hormone which controls the development of male secondary sexual character is called ..... .
Ans : estosterone

22. A ..... mechanism regulates the action of hormones.
Ans : feed back

23. An axon terminal passes the electrical stimulus to a dendrite of next neuron through ..... reaction.
Ans : chemical

24. Hormones are carried by ..... to target organs where they perform a specific function.
Ans : blood stream

25. Sneezing is a ..... .
Ans : reflex action

26. The nervous system uses ..... to transmit messages.
Ans : electrical impulses

27. ..... performs control and coordination in plants.
Ans : Phytohormones

28. ..... promotes senescence and is found in high concentration in ripened fruits.
Ans : thylene

29. Apical dominance - Auxin; reversal of dwarfism .....
Ans : GA

30. If the dark period is interrupted by flashes of light ..... plant will not flower.
Ans : Short day

31. ..... hormone increases heartbeat rate when we get a fright.
Ans : Adrenalin

32. Short day plants come to flower ..... a critical photoperiod.
Ans : Below

33. ..... is the irreversible increase in size, volume or weight of an organ or organism.
Ans : Growth

3. TRUE/FALSE

1. The central nervous system consists of the brain and spinal cord.
Ans : True

2. From a functional perspective, the nervous system provides slow, long-term coordination.
Ans : False

3. All animals have complex nervous systems.
Ans : False

4. One-celled organisms can respond to stimuli.
Ans : True

5. The human brain is the largest of all animals.
Ans : False

6. The main thinking part of brain is hind brain.
Ans : False

7. Functioning of various organs in uniformity is called coordination.
Ans : True

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

9. Thyroxine regulatres the blood-sugar.
Ans : False

10. Motor neurons carry signals from receptors to spinal cord.
Ans : False

11. Brain is the structural and functional unit of nervous system.
Ans : False

12. Centres of hearing, smell, memory, sight, etc., are located in fore brain.
Ans : True

13. Feeling hunger is a reflex action.
Ans : False

14. Brains can work 24 hours a day with no rest.
Ans : False

15. Immediate response to stimulus is shown as Mimosa pudica.
Ans : True

16. Sensory neurons carry signals from spinal cord to muscles.
Ans : False

17. Portions of your brain are responsible for specific functions.
Ans : True

18. The nervous system is closely associated with every system in your body.
Ans : True

19. Involuntary actions like salivation, vomiting, blood pressure are controlled by the medulla in the hind brain.
Ans : True

20. Cerebellum does not control posture and balance of the body.
Ans : False

21. A neuron transmits electrical impulses not only to another neuron but also to muscle and gland cells.
Ans : True

22. 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.
Ans : True

23. Apical dominance is the function of Auxin.
Ans : True

24. Sugarcane is short day plant.
Ans : True

25. Photoperiodism was first studied by Garner and Allard.
Ans : True

26. Auxin 'b' isolated from corn germ oil.
Ans : True

27. Growth inhibitors are Ethylene and ABA.
Ans : True

28. Blue light effective in phototropism.
Ans : True

29. Mimosa plant showing seismonfastic movement.
Ans : True

30. Bending of Tentacles in Drosera is Thigmonasty.
Ans : True

31. Only the vertebrates have a nervous system.
Ans : False

32. The propagation of a nerve impulse is due to changes in the permeability of the nerve cell membrane that allows for a voltage difference across the membrane.
Ans : True

33. Rise in sugar level in blood stops secretion of insulin by pancreas.
Ans : True

34. Growth hormone is secreted by adrenal gland.
Ans : False

35. Fore-brain is centre of intelligence, control of movements, hearing, smell and sight.
Ans : True

36. Stems are positively geotropic while roots are negatively geotropic.
Ans : False

37. Sudden action in response to something in the environment is called reflex action.
Ans : True

38. Cytokinins are present in greater concentration in young fruits and seeds.
Ans : True

39. Junction between two neurons is called synapse.
Ans : True

40. Spinal cord originates from Cerebellum.
Ans : False

4. MATCHING QUESTIONS

DIRECTION : Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in column I have to be matched with statements (p, q, r, s) in column II.

1.

Column I		Column II	
(A)	Parthenocarpy	(p)	Photoperiodism
(B)	Apical dominance	(q)	Development of seed less fruit
(C)	Extreme cold treatment	(r)	Vernalization
(D)	Response to length of the day	(s)	Auxin

Ans : A-q, B-s, C-r, D-p

2.

Column I		Column II	
(A)	Auxin	(p)	GA_3
(B)	Gibberellin	(q)	IAA
(C)	Cytokinin	(r)	ABA
(D)	Dormin	(s)	Zeatin

Ans : A-q, B-p, C-s, D-r

3.

Column I		Column II	
(A)	Cerebrum	(p)	controls the pituitary
(B)	Cerebellum	(q)	controls vision and hearing
(C)	Hypothalamus	(r)	controls the rate of heart beat
(D)	Midbrain	(s)	seat of intelligence
		(t)	maintains body posture

Ans : A-t, B-t, C-p, D-q

4.

Column I		Column II	
(A)	Hypothalamus	(p)	relaxin
(B)	Anterior pituitary	(q)	estrogen
(C)	Testis	(r)	FSH and LH
(D)	Ovary	(s)	testosterone
		(t)	gonadotropin releasing hormone

Ans : A-t, B-r, C-s, D-q

5.

	Column I (Animal)		Column II (Respiratory Organ)
(A)	Cyton	(p)	The body of the nerve cell that contains the organelles.
(B)	Dendrite	(q)	Receives the stimuli sent from another nerve or the outside environment.
(C)	Axon	(r)	The long, thin section of the nerve cell where the impulse is transmitted across.
(D)	Myelin sheath	(s)	A fatty substance that covers the axon of the nerve cell and speeds.

Ans : A-p, B-q, C-r, D-s

DIRECTION : Match the word in Column A with its related information in Column B.

6.

	Column I		Column II
1.	Dendrite	(a)	the impulse is converted into a chemical signal for onward transmission.
2.	Axon	(b)	blood pressure and vomiting
3.	Nerve endings	(c)	where information is acquired
4.	Fore brain	(d)	walking in a straight line
5.	Cerebellum	(e)	through which information travels as an electrical impulse
6.	Medulla	(f)	hearing and sight

Ans : 1-(c), 2-(a), 3-(e), 4-(f), 5-(d), 6-(b)

5. ASSERTION AND REASON

DIRECTION : In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

(e) Both Assertion and Reason are false.

1. **Assertion :** Suppression of growth of anxiliary buds is called apical dominance.
Reason : It is due to effect of downward movement of Auxin from apical region towards the lower side.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

2. **Assertion :** Phototropism is a directional growth movement.
Reason : It occurs in the direction of light.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
Phototropism is the movement or bending of light towards light. Hence, it is known as directional growth movement.

3. **Assertion :** Plants lack the nervous system, but they do coordinate.
Reason : It is so because of hormones.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
Plants lack the nervous system, but coordinate *via* the hormones.

4. **Assertion :** Reflex actions are automatic and repid responses to stimuli.
Reason : These actions are controlled by brain.
Ans : (c) Assertion (A) is true but reason (R) is false.
Reflex actions are automatic and rapid response to stimuli. These actions are controlled by spinal cord, not by brain.

5. **Assertion :** Olfactory receptors detect taste.
Reason : Olfactory receptors are present in cerebellum.
Ans : (e) Both Assertion and Reason are false.
Gustatory receptors detect taste, while olfactory receptors detect smell. Both Assertion and Reason are false.

6. **Assertion :** Cytokinins are present in highest concentration in fruits and seeds.
Reason : Cytokinins are responsible for promoting cell division.
Ans : (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
Cytokinins are the hormones, which promote cell division. Highest concentrations of cytokinins occurs in fruit and seeds, i.e., areas of rapid cell division.

7. **Assertion :** Abscisic acid is responsible for wilting of leaves.
Reason : It is a growth inhibitor.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
Abscisic acid is responsible for wilting of leaves

because it is a growth inhibitor.

8. **Assertion :** Medulla oblongata causes reflex actions like vomiting, coughing and sneezing.
Reason : It has many nerve cells which control autonomic reflexes.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

9. **Assertion :** Transmission of the nerve impulse across a synapse is accomplished by neurotransmitters.
Reason : Transmission of the nerve impulse across a synapse is accomplished by neurotransmitters.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

10. **Assertion :** A person has lost most of its intelligence memory and judgement.
Reason : A person has operated a tumour located in the cerebrum.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

11. **Assertion :** Males have more stature than females during puberty.
Reason : This is because of presence of thyroxin in the blood of females.
Ans : (c) Assertion (A) is true but reason (R) is false.
Males has more stature than females because of action of male sex hormone called testosterone, which is secreted by testis in males. Testosterone controls the development of secondary sexual characters in males. Thyroxin increases the metabolic rate of the body and maintains BMR.

12. **Assertion :** Phototropism is caused by auxin.
Reason : When light is coming from one side of the plant, auxin diffuses towards the shady side of the shoot.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
Auxin promotes phototropism. When light is coming from one side of the plant, auxin diffuses towards the shady side of the shoot. This concentration of auxin stimulates the cells to grow longer on the side fo the shoot which is away from light. Thus, the plant appears to bend towards light while growing.

13. **Assertion :** Gibberellins induce internodal growth in dwarf plant varieties.
Reason : Gibberellins when applied to normal plants, it increases the length of the plant.
Ans : (c) Assertion (A) is true but reason (R) is false.
Gibberellin induces internodal growth and overcome the phenotypic expression of dwarfism in certain plants. It has little or no effect when they are applied to the normal plant.

14. **Assertion :** Senescence is delayed by the application of cytokinin in plants.
Reason : Cytokinin prevents the breakdown of chlorophyll, proteins and nucleic acid.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

15. **Assertion :** In short day plant, day length should be less than critical day length.
Reason : Long night should be continuous.
Ans : (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

16. **Assertion :** Unlike cabbage, sunflower plant has long internode with leaves that are far apart.
Reason : Sunflower produces sufficient amounts of Gibberellins during its growing period.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

17. **Assertion :** Antheorozoids of Funaria show chemotropic movement.
Reason : This is a paratonic movement of locomotion.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

18. **Assertion :** Seismonastic movement shown by Mimosa pudica plant.
Reason : It is due to change in turgidity of cells of pulvinus.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

19. **Assertion :** Plant hormones are growth regulator.
Reason : Growth regulators promote or inhibit the growth.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
Plant hormones are chemical compound produced naturally in plants which control the growth and other physiological functions at a site far away from the place of secretion and required in very small amount. It can have promoting or inhibiting effect on a process and hence, it is a growth regulator.

20. **Assertion :** Auxins are in the grwoing tips of the plant.
Reason : Auxin concentration is highest at the tip of the root.
Ans : (c) Assertion (A) is true but reason (R) is false.
Auxin, a plant hormone is synthesized at the grwoing tips of the plant i.e. tip of coleoptiles, in buds and in growing tips of leaves and roots. The concentration of auxin found at the tip of the root is significantly lower than the concentration found at the top of coleoptiles.

21. **Assertion :** A receptor is a specialized group of cells

in a sense organ that perceive a particular type of stimulus.

Reason : Different sense organs have different receptors for detecting stimuli.

Ans : (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

22. Assertion : Abscisic acid is a stress hormone.

Reason : Stimulation of ABA occurs in adverse conditions.

Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Absicsic is a stress hormone as its production is stimulated by drought, water logging and other adverse (stressful) conditions.

23. Assertion : Units which make up the nervous system are called neurons.

Reason : Nerve impulses are carried by dendrites towards the cell body.

Ans : (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

Both the statements are true. Nervous system is the system of conducting tissues that receives the stimulus and transmits it to other parts of the body forming a network of nerves. It is involved in receiving information (sensation) and generating responses to that information (motor response). The units which make up the nervous system are called nerve cells or neurons. Nerve impulses are always transmitted across a synapse from the axon terminals of one neuron to the dendrite/cell body of the next neuron.

24. Assertion : Cyton region of nerve fibre collects information for the brain.

Reason : Nerve fibres can either have or lack myelin sheath.

Ans : (d) Assertion (A) is false but reason (R) is true.

25. Assertion : Animals can react to stimuli in different ways.

Reason : All animals have a nervous system and an endocrine system involving hormones.

Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

26. Assertion : The effect of auxin hormone on the growth of root is exactly opposite to that on a stem.

Reason : Auxin hormone increases the rate of growth in root and decreases the rate of growth in stem.

Ans : (c) Assertion (A) is true but reason (R) is false.

27. Assertion : Insulin regulates blood sugar level.

Reason : Insufficient secretion of insulin will cause diabetes.

Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

28. Assertion : Nerve impulse is a one way conduction.

Reason : Nerve impulse is transmitted from dendrite to axon terminals.

Ans : (c) Assertion (A) is true but reason (R) is false.

Nerve impulse are always transmitted across a synapse from the axon terminals of one neuron to the dendrite/cell body of the next neuron but never in the reverse direction. Since, the neurotransmitter is present only in the axon terminals and not in the dendrite or cell body, it cannot be released from the dendrite or cell body even if the impulse reaches there.

29. Assertion : Our body maintains blood sugar level.

Reason : Pancreas secretes insulin which helps to regualte blood sugar levels in the body.

Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Pancreas secretes insulin which helps to regulate blood sugar levels in the body. If the sugar level in blood rises, they are detected by the cells of the pancreas which respond by producing more insulin. As the blood sugar level falls, insulin secretion is reduced.

30. Assertion : Failure of secretion of growth hormone from an early age causes dwafrism in the patient.

Reason : Growth hormone stimulates the body growth and elongation of long bones.

Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Growth hormone is secreted by the anterior lobe of pitnitary gland. It stimulates body growth. The failure of secretion of growth hormone from an early age causes dwafrism while excessive secretion of this hormone from childhood leads to gigantism.