CLASS X CONTROL AND COORDINATION

MCQs

1. When a person is suffering from severe cold, he or she cannot -
a) Differentiate the taste of an apple form that of an ice cream.
b) Differentiate red light from green light.
c) Differentiate a hot object form a cold object.
d) Differentiate the smell of a perfume form that of an agarbatti

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3. The brain is lodged inside the cavity of skull known as:
a) Piamater. b)Duramater. c) Cranium. d) Meninges

4. Which one of the endocrine glands is known as master gland?
a) Pituitary. b) Adrenal
c) Thyroid. d) Parathyroid

5. The growth of tendrils in pea plants is due to
a) effect of light. b) effect of gravity
c) rapid cell division in tendrillar cells in contact with the support
d) rapid cell divisions in tendrillar cells that are away from the support

6. Dwarfism results by
a) Excess secretion of thyroxin
b) Less secretion of growth hormone
c) less secretion of adrenaline
d) Excess secretion of growth hormone.

7. The neurons that carry nerve impulse from spinal cord to effectors are called
a) Sensory neurons. b) motor neurons
c) Inteneurons. d) spinal neurons

8. Select the mismatched pair
a) Adrenaline - Pituitary gland
b) Testosterone - Testes
c) Estrogen Ovary
d) Thyroxin - Thyroid gland.

1. (d) 2. (d). 3. c) . 4. a) 5. d. 6. b) . 7. b. . 8.A

9. Which one of the following is a nastic movemen in plants?
a) Bending of plants towards light
b) Growing of roots towards gravity.
c) Droping of touch me not leaflets on touch
d) Movement of pollen tubes towards chemicals.

10. Visceral nervous system controls and integrates the function of -
a) Urinary bladder. b) Blood vessels. c) Heart. d) All of the above

11. Which of the following statements are true about the brain?

(i) The main thinking part of brain is hind brain.
(ii) Centers of hearing, smell, memory, sight, etc are located in fore brain.
(iii) Salivation, vomiting, blood pressure are controlled by the medulla in the hind brain.
(iv) Cerebellum does not control posture and balanc of the body.

a) (i) and (ii)
b) (ii) and (iii)
c) (i), (ii) and (iii)
d) (iii) and (iv)

12. The substance that result into the fall of mature leave and fruits from plants is due to :
a) auxin. b) gibberllin. c) ABA. d) cytokinin

13. Which of the following is NOT a function of the brain?
A) Thinking. B) Balancing
C) Pumping blood. D) Regulating respiration

14. Which of the following is NOT a function of the autonomic nervous system?
A. Beating of heart
B. Movement of hand to catch a ball
C. Peristaltic movement of food in the intestine
D. Dilation of pupil

15. Which of the following hormones is secreted by the pancreas?
A. Insulin. B. Thyroxine. C. Adrenaline. D. Growth hormone

16. The electrical impulses in the human body are transmitted by:
A. Blood. B. Muscles. C. Neurons. D. Bones

9. C. 10. d) 11. b. 12. c) 13. C). 14. : B. 15. : A. 16. C.

17. Which of the following endocrine glands is located in the brain?
A. Adrenal. B. Pancreas. C. Pituitary. D. Thyroid

18. Adrenaline hormone is secreted in large amounts when a person is:
A. Sleeping. B. Eating. C. Relaxed. D. Frightened or angry

19. The plant hormone responsible for cell elongation is:
A. Auxin. B. Cytokinin. C. Gibberellin. D. Ethylene

20. Reflex actions are controlled by:
A. Brain. B. Spinal cord. C. Cerebellum. D. Cerebrum

21. Which of the following is not a plant hormone?
A. Insulin. B. Gibberellin. C. Cytokinin. D. Ethylene

22. Movement of sunflowers towards sunlight is an example of:
A. Geotropism. B. Hydrotropism. C.photonasty. D. Phototropism

23. Which part of the brain is responsible for maintaining posture and balance of the body?
A. Cerebrum. B. Cerebellum. C. Medulla. D. Thalamus

24. Which plant hormone promotes dormancy in seeds and buds?
(a) Auxin. (b) Gibberellin. (c) Cytokinin. (d) Abscisic acid

25. Which part of the brain controls voluntary actions?
A) Medulla b) Cerebellum c) Cerebrum d) Spinal cord

17. C. 18. D. 19. : A. 20. B. 21. A. 22: D. 23. : B. 24. d. 25. C.

Assertion & Reason Type Questions

Directions: Each of the following questions consists of two statements, one is Assertion (A) and the other is Reason (R). Give answer:
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.

Q1. Assertion (A): A neuron transmits message in both directions.
Reason (R): Neuron is specialised for conducting information via electrical impulses from one part of body to another.

Q2. Assertion (A): Cerebellum controls the coordination of body movement and posture.
Reason (R): Medulla oblongata controls and regulates the centre for coughing, sneezing and vomiting.

Q3. Assertion (A): Movement of leaves of sensitive plant is different from movement of a shoot towards light.
Reason (R): Sensitive plant shows seismonastic movements which are due to turgidity of cells whereas the movement of shoot is a tropic movement.

Q4. Assertion (A): Adrenaline makes the heartbeat faster, resulting in supply of more oxygen to our muscles.
Reason (R): Adrenaline is secreted directly into the blood and carried to different parts of the body.

Q5. Assertion (A): Amount and timing of hormones released are regulated by feedback mechanisms.
Reason (R): Hypersecretion or hyposecretion of any hormone can lead to different disorders.

Q6. Assertion (A): Insulin regulates blood sugar level.
Reason (R): Insufficient secretion of insulin will cause diabetes.

Q7. Assertion (A): Animals can react to stimuli in different ways.
Reason (R): All animals have a nervous system and an endocrine system involving hormones.

Q8. Assertion(A): The effect of auxin hormone on the growth of root is exactly opposite to that on a stem.
Reason (R): Auxin hormone increases the rate of growth in root and decreases the rate of growth in stem.

Q9. Assertion (A): A receptor is a specialized group of cells in a sense organ that perceive a particular type of stimulus.
Reason (R): Different sense organs have different receptors for detecting stimuli.

Q10. Assertion(A): Cyton region of nerve fibre collects information for the brain.
Reason (R): Nerve fibres can either have or lack myelin sheath.

Q11. Assertion (A): A nerve impulse is an electrochemical event.
Reason (R): In a nerve impulse there are changes in the resting potential which spreads down the nerve fibre.
Q12. Assertion(A): The brain is also known as the central nervous system.

Reason (R): Central nervous system controls and regulates the voluntary actions.
Q13. Assertion(A): The spinal nerves are 31 pairs.
Reason (R): Spinal nerves only have sensory neurons in them

Answer1: (d) Assertion is false because neurons are unidirectional, I.e., electrical impulses enter from one end and leave through the other.
Answer2: (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
Answer3: (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
Answe4r: (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
Answer5: (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
Answer6: (a). Answer: 7. (a). Answer: 8. c.
Answer: 9. (b). Answer: 10. (d)
Answer: 11. (a). Answer: 12. (d). Answer:13. ©

Q. A cheetah, on seeing a prey, moves towards him at a very high speed. What causes the movement of his muscles? How does the chemistry of cellular components of muscles change during this event? .

A. A cheetah on seeing a prey generates a nerve impulse which reaches the muscles and the muscle fibre moves.
The muscle cell will then move by changing their shape so that muscle cells shorten. Muscle cells have special proteins that change both shape and their arrangement in the cell in response to nervous electrical impulses. When this happens new arrangements of these proteins give the muscle cells a shorter form.

CASE STUDY : 1
If the body design in the squirrel relied only on electrical impulses via nerve cells, the range of tissues instructed to prepare for the coming activity would be limited. On the other hand, if a chemical signal were to be sent as well, it would reach all cells of the body and provide the wide-ranging changes needed. This is done in many animals, including human beings, using a hormone called adrenaline that is secreted from the adrenal glands.

i) which is the target organ for the adrenaline hormone?
ii) Which hormone is released by the thyroid gland?
iii) What is the function of thyroxine hormone?
iv) Name the hormone released by the ovary?

V) Name the three hormonal glands located in the brain?

Ans(i) : Heart is the target organ for the adrenaline hormone which increases the heartbeat rate.
Ans:ii. Thyroxine is released by thyroid gland.
Ans iii: It regulates carbohydrate, protein and fat metabolism in the body and promote the best balance for growth.
Ans iv. : Estrogen and progesterone
Ans:v. Pineal, pituitary and hypothalamus

CASE STUDY : 2
Some plants like the pea plant climb up other plants or fences by means of tendrils. These tendrils are sensitive to touch. When they come in contact with any support, the part of the tendril in contact with the object does not grow as rapidly as the part of the tendril away from the object. This causes the tendril to circle around the object and thus cling to it. More commonly, plants respond to stimuli slowly by growing in a particular direction. Because this growth is directional, it appears as if the plant is moving.

i) How many type of tropism are shown by plants? Name them.
ii) The touch me not plant is an example of which tropism?
iii) give one example of chemotropism?
iv) Name the plants hormone which promotes cell division?
v) Name the plant hormone which inhibits growth?

Ans:i. Generally there are 6 type of tropism namely phototropism, gravitropism, chemotropism, thigmotropism, thermotropism and hydrotropism
Ans. ii: it is an example of thigmotropism.
Ans: iii. growth of pollen tubes to wheels is one example of chemotropism.
Ans: iv. Cytokinins promotes cell division in plants.
Ans: v. Abscisic acid

CASE STUDY : 3

We also think about our actions. Writing, talking, moving a chair, clapping at the end of a programme are examples of voluntary actions which are based on deciding what to do next. So, the brain also has to send messages to muscles. This is the second way in which the nervous system communicates with the muscles. The communication between the central nervous system and the other parts of the body is facilitated by the peripheral nervous system consisting of cranial nerves arising from the brain and spinal nerves arising from the spinal cord. The brain thus allows us to think and take actions based on that thinking.

i) what are the three major parts of the brain?
ii) what are the function of medulla?
iii) Which fluid is present in our brain?
iv) What is the function of hypothalamus?
v) What is the function of mid brain?

Ans: i. Forebrain, Midbrain and hindbrain.
Ans: ii. It controls all the involuntary action such as blood pressure, salivation, vomiting, etc.
Ans: iii. Cerebrospinal fluid.
Ans:iv. It regulates homeostasis, releases hormones.
Ans:v. The mid brain connects the forebrain and hindbrain.

Questions Answers -
1. Name the two sets of nerves that constitute the peripheral nervous system.

Q.2 Give a reason to explain why
(a) adrenaline helps in dealing emergency situations?
(b) secretions of growth hormone should be specific in the human body?

Q.3) Why do leaves drop off seasonally?

Ans1. Sympathetic nervous system and Parasympathetic nervous system.
Ans. 2) a. Adrenaline increases the heart beat and breathing rate which results in the supply of more oxygen to muscles. It reduces the blood to the digestive system and skin, as a result the blood is further diverted to skeletal muscles. All these responses together prepare the body to deal with the emergency situations.

b. If growth hormones is secreted in excess during childhood then it leads to gigantism while the less secretion of this hormone during childhood causes dwarfism.

Ans. 3. The leaves drop off seasonally as they stop producing auxins, which normally prevents the formatio of abscission zone that cuts off nutrients and water supply to leaves.

4. Name the plant hormone:
(a) which inhibits growth and causes wilting of leaves.
(b) which promotes cell division.

Ans.4) a. Abscisic acid.
b. Cytokinins.

Q.5. Taking the example of heart beat, justify the antagonistic action of the sympathetic and the parasympathetic nerves.

Q.6) Why is abscisic acid known as stress hormone in plants?

Q.7) Name the part of neuron
(a) where information is acquired.
(b) through which information travels as an electri impulse.

Ans.5. Sympathetic system increases contraction and rhythm and parasympathetic system decreases contraction and rhythm with respect to heart beat.
Ans.6) Abscisic acid in a plant hormone which inhibits growth. Its effects include wilting of leaves.
Ans. 7) a. Dendrite. b. Axon

Q.8) How does the plant shoot bends, when the plant is placed in a room having only one open window?

Ans. 8) When the plant is placed in such a room that has

9. Write the function of hormone "thyroxine" produced in our body.

Ans9. It controls overall metabolic rate of the body.

10. Name the hormones secreted by pancreas.

Ans 10. Insulin and Glucagon.

11. Give reason why endocrine glands release theft secretions into the blood?

Ans.11. Endocrine glands are ductless glands and their products have to act at a distant site.

12. A person suffered a head injury, due to which he faces breathing problem. No problem was detected with his respiratory system. What could be the cause of this problem?

Ans12. . As the problem is caused due to head injury, it could be related to "Pons" a part of Hind brain responsible for regulation of respiration.

13. In a family of normal sized members, there are two exceptions, one member is dwarf and one is tall like "Khali". What could be the cause of it?

Ans 13vv. In case of dwarfs, there is a deficiency of growth hormone from Pituitary gland and in case of giants excess or growth hormone is produced during childhood.

14. Why do you blink your eyes as bright light focused on you?

Ans.14. We blink in order to protect the eye from bright light which otherwise would damage the retina.

15. Name two activities which are regulated by plant pigments.

Ans.15. 1) some specialized pigments, phytochromes are responsible of the response to photoperiodic stimulus.
2) The control and co ordination in plants with its environment is regulated by phytohormoens & phytochromes together.

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

Ans 16. . Smell of agarbatti is detected by olfactory receptors in the temporal lobe of fore-brain. It is first received by olfactory receptors in our nose.

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

Ans.17. Reflex arcs are formed in the spinal cord itself although the information also goes on to brain where the encounter remains the memory and make us aware of our action.

18. Which signal will get disrupted in case of a spinal cord injury?

Ans.18. (i) It disturbed all the involuntary actions. (ii) Reflex actions will be disrupted because reflexes are located in the spinal cord. Therefore, the quick response required to safe guard the body will not take place.

19. How does a touch me not plant respond on touching? What is this movement called?

Ans.19. Touch me not plant folds its leaflets touching. This type of movement is called Grov independent movement.

20. Why is the use of iodised salt advisable?

Ans 20. Iodine is necessary for the synthesis of thyroxine. Iodised salt prevents iodine deficiency and goitre.

21. How does the nervous tissue cause action in response to stimulus?

Ans 21. Nervous tissue transmits electrical impulses to muscles, causing contraction and movement in response to stimuli.

22. Differentiate between reflex action and walking.

Answer22. : Reflex action is an involuntary and immediate response to stimuli (e.g., pulling hand away from flame), while walking is a voluntary action controlled by the brain.

23bbWhat is the function of the medulla in the brain?
Answer: 23. The medulla controls involuntary functions such as heartbeat, breathing, and blood pressure.

24b. State two differences between sensory and motor neurons.

*Answer 24. Sensory neurons carry impulses from receptors to the CNS; motor neurons carry impulses from CNS to effectors.

Sensory neurons detect stimuli; motor neurons cause response.*

25. How do tendrils of a plant find support to climb?
Answer: 25. Tendrils show thigmotropism — they respond to touch by coiling around the support for climbing.

26. What are effectors? Give examples.
Answer: 26. Effectors are organs that act in response to nerve impulses. Examples: muscles and glands.

27. Nervous system is localized; hormones are systemic.

Ans 27. "Localized" means that the action of the nervous system is specific and targeted. Nerve signals (electrical impulses) travel along specific pathways (neurons) to reach precise destinations, like muscles, glands, or other neurons.

Each neuron has specific connections (synapses), which allow it to affect only certain target cells.
For example, if you touch something hot, a specific sensory neuron detects it, and a motor neuron sends a signal to a specific muscle to pull your hand away — this is a quick, direct, and localized

2. Hormones are Systemic
"Systemic" means that hormones affect the entire body or multiple organs/tissues.
For example, insulin is released by the pancreas into the blood and affects many cells in the body (muscle, fat, liver) to take up glucose — this is a broad, widespread effect.

Feature	Nervous System	Hormonal System (Endocrine)
Method of signal	Electrical impulses via neurons	Chemical messengers via blood
Speed	Very fast	Slower
Duration of response	Short	Longer-lasting
Specificity	Highly targeted (localized)	Broad effects (systemic)
Area affected	Specific muscles/organs	Multiple or entire

🔹 5. What is phototropism? Describe an experiment to demonstrate it.
Expected Points:

Phototropism: growth towards/away from light.
Experiment: plant in a box with a light source from one side.
Observation: stem bends towards light due to auxin distribution.

🔹 6. How does feedback mechanism regulate the timing and amount of hormone released?
Expected Points:

Feedback mechanism maintains homeostasis.
Example: Pancreas regulates insulin based on blood sugar.
If sugar level rises, insulin is released; if normal, insulin release stops.

🔹 7. Differentiate between voluntary, involuntary, and reflex actions with examples.
Expected Points:

Voluntary: under conscious control (e.g., walking).
Involuntary: not under conscious control (e.g., heartbeat).
Reflex: sudden response without thinking (e.g., pulling hand from flame).

🔹 8. Describe the function of any three parts of the human brain.
Expected Points:

Cerebrum: thinking, memory, sensory processing.

Cerebellum: balance, coordination.
Medulla: involuntary actions like breathing, heartbeat.

🔹 9. How does adrenaline help the body to cope with emergency situations?
Expected Points:

Secreted by adrenal glands during stress.

Increases heart rate, breathing, blood flow to muscles.

Prepares body for 'fight or flight' response.

🔹 10. Explain the role of auxins in bending of a plant stem towards light.
Expected Points:

Auxins promote cell elongation.

Light causes uneven distribution of auxins (more on shady side).

Cells on shady side elongate, causing stem to bend towards light