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Biology Grade 12 — Chapter 5

Nervous System of Man

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Independent practice MCQs from the supplied Class 12 Biology notes pack. Total: 50 questions.

A. Important / Main Topics

1. A cell that responds to a stimulus is called a:

(A) Receptor cell
(B) Effector
(C) Neuron
(D) Synapse

Correct Answer: A

Explanation: A cell that responds to a stimulus is called a receptor cell.

2. Receptors are:

(A) Effectors
(B) Transducers
(C) Synapses
(D) Neurotransmitters

Correct Answer: B

Explanation: Receptor cells are transducers; they convert energy from one form such as light, heat or sound into energy in an electrical impulse.

3. The basic structural and functional unit of the nervous system is the:

(A) Nephron
(B) Alveolus
(C) Neuron
(D) Villus

Correct Answer: C

Explanation: Neurons are the basic structural and functional unit of the nervous system.

4. The cell body of a neuron contains:

(A) Only a nucleus
(B) Only mitochondria
(C) Only ribosomes
(D) A nucleus and organelles

Correct Answer: D

Explanation: The cell body of a neuron contains A nucleus and organelles.

5. The short, branched extensions of a neuron that receive stimuli are called:

(A) Dendrites
(B) Axons
(C) Synapses
(D) Terminals

Correct Answer: A

Explanation: Dendrites are short and thin, often highly branched cytoplasmic extensions that receive stimuli.

6. The long, thick nerve fibre that conducts impulses away from the cell body is the:

(A) Dendrite
(B) Axon
(C) Synapse
(D) Ganglion

Correct Answer: B

Explanation: An axon is comparatively a long and thick nerve fibre which conducts action potentials away from the cell body.

7. Which type of neuron carries sensory information to the central nervous system?

(A) Motor neuron
(B) Interneuron
(C) Sensory neuron
(D) Effector neuron

Correct Answer: C

Explanation: Sensory neurons convert signals received from the environment into corresponding stimuli and carry sensory information to the brain and spinal cord.

8. Which type of neuron transmits information from the brain to the effector?

(A) Sensory neuron
(B) Interneuron
(C) Receptor neuron
(D) Motor neuron

Correct Answer: D

Explanation: Motor neurons transmit information from the brain to the effector (muscles or gland) of the body.

9. The two examples of effectors are:

(A) Muscles and glands
(B) Neurons and synapses
(C) Receptors and transducers
(D) Axons and dendrites

Correct Answer: A

Explanation: The two examples of effectors are muscles and glands.

10. The immediate, automatic, and involuntary response to a stimulus is called:

(A) Synaptic transmission
(B) Reflex action
(C) Nerve impulse
(D) Depolarization

Correct Answer: B

Explanation: Reflex action is an immediate, automatic and involuntary response to external and internal environmental changes.

11. A typical reflex arc includes how many fundamental parts?

(A) Three
(B) Four
(C) Five
(D) Six

Correct Answer: C

Explanation: Five — this correctly answers the question.

12. The resting membrane potential is:

(A) +50 mV
(B) 0 mV
(C) +70 mV
(D) −70 mV

Correct Answer: D

Explanation: The resting membrane potential is expressed as −70 mV.

13. The active membrane potential is:

(A) +50 mV

(B) −70 mV
(C) 0 mV
(D) −50 mV

Correct Answer: A

Explanation: During depolarization, the membrane potential changes from −70 mV to +50 mV.

14. The junction between two neurons is called a:

(A) Node of Ranvier
(B) Synapse
(C) Ganglion
(D) Tract

Correct Answer: B

Explanation: The junction between axon terminal of one neuron and the dendrite of another neuron is called a synapse.

15. Which neurotransmitter is excitatory in the peripheral nervous system?

(A) GABA
(B) Glycine
(C) Acetylcholine
(D) Dopamine

Correct Answer: C

Explanation: Acetylcholine is an excitatory neurotransmitter of peripheral nervous system.

16. What is the function of the myelin sheath?

(A) To slow down nerve impulses
(B) To produce neurotransmitters
(C) To receive stimuli
(D) To insulate the axon and speed up impulse transmission

Correct Answer: D

Explanation: The myelin sheath acts as an insulating sheath and prevents loss of energy, and saltatory conduction speeds up impulse transmission.

17. What is saltatory conduction?

(A) Jumping of action potential from one node of Ranvier to another
(B) Continuous conduction along the axon
(C) Transmission across a synapse
(D) Movement of ions across the membrane

Correct Answer: A

Explanation: Saltatory conduction is the rapid transmission of a nerve impulse along an axon, resulting from the action potential jumping from one node of Ranvier to another.

18. What is the function of the sodium-potassium pump?

(A) To produce neurotransmitters
(B) To maintain resting membrane potential
(C) To receive stimuli
(D) To conduct impulses

Correct Answer: B

Explanation: To maintain resting membrane potential — this correctly answers the question.

19. What happens during depolarization?

(A) Na□ ions rush out of the cell
(B) K□ ions rush into the cell
(C) Na□ ions rush into the cell
(D) Ca²□ ions rush out of the cell

Correct Answer: C

Explanation: Na□ ions rush into the cell — this correctly answers the question.

20. What happens during repolarization?

(A) Na□ ions rush into the cell
(B) Ca^{2}□ ions rush into the cell
(C) Cl□ ions rush into the cell
(D) K□ ions rush out of the cell

Correct Answer: D

Explanation: K□ ions rush out of the cell — this correctly answers the question.

21. What is a threshold stimulus?

(A) A stimulus capable of producing action potential
(B) A stimulus that does not produce any response
(C) A stimulus that blocks action potential
(D) A stimulus that only affects the synapse

Correct Answer: A

Explanation: If a stimulus is capable to produce action potential in neuron, it is called threshold stimulus.

22. What is the function of neurotransmitters?

(A) To insulate the axon
(B) To transmit signals across a synapse
(C) To produce myelin
(D) To maintain resting potential

Correct Answer: B

Explanation: Neurotransmitters are chemical messengers that transmit signals across a synapse from one neuron to another.

23. What is the function of acetylcholinesterase?

(A) To synthesize acetylcholine
(B) To produce dopamine
(C) To break down acetylcholine
(D) To transmit nerve impulses

Correct Answer: C

Explanation: Acetylcholine is hydrolyzed by acetylcholinesterase after it has acted on the postsynaptic membrane.

24. Which part of the brain controls equilibrium and coordination?

(A) Cerebrum
(B) Medulla
(C) Thalamus
(D) Cerebellum

Correct Answer: D

Explanation: Cerebellum — this correctly answers the question.

25. Which part of the brain controls heartbeat, blood pressure, and respiration?

(A) Medulla
(B) Cerebrum
(C) Cerebellum
(D) Thalamus

Correct Answer: A

Explanation: The medulla controls the automatic functions of the body, such as heartbeat, blood pressure, respiration, swallowing etc.

B. Less Important / Secondary Topics

26. Which part of the brain is the largest?

(A) Cerebrum

(B) Cerebellum
(C) Medulla
(D) Pons

Correct Answer: A

Explanation: Cerebrum is the largest part of the human brain.

27. How many pairs of cranial nerves are there?

(A) 10
(B) 12
(C) 31
(D) 8

Correct Answer: B

Explanation: There are twelve cranial nerve pairs.

28. How many pairs of spinal nerves are there?

(A) 12
(B) 8
(C) 31
(D) 5

Correct Answer: C

Explanation: There are 31 pairs of spinal nerves, one on each side of the vertebral column.

29. The somatic nervous system is involved in:

(A) Unconscious activities
(B) Reflex actions only
(C) Hormone secretion
(D) Conscious activities

Correct Answer: D

Explanation: The somatic nervous system consists of cranial and spinal nerve fibres that connect the CNS to the skin and skeletal muscles; it is involved in conscious activities.

30. The autonomic nervous system is concerned with:

(A) Unconscious activities
(B) Conscious activities
(C) Voluntary movements
(D) Sensory perception

Correct Answer: A

Explanation: The autonomic nervous system is concerned with unconscious activities.

31. Which division of the autonomic nervous system prepares the body for fight or flight?

(A) Parasympathetic
(B) Sympathetic
(C) Somatic
(D) Central

Correct Answer: B

Explanation: The sympathetic division controls various autonomic functions during the state of emergency and prepares the body for fight or flight response.

32. Which division of the autonomic nervous system returns the body to normal after danger?

(A) Sympathetic
(B) Somatic
(C) Parasympathetic
(D) Central

Correct Answer: C

Explanation: Parasympathetic — this correctly answers the question.

33. What is the function of olfactory receptors?

(A) Detect light
(B) Detect sound
(C) Detect pressure
(D) Detect chemicals (smell)

Correct Answer: D

Explanation: The smell or olfactory receptors are chemoreceptors, stimulated by chemicals dissolved in liquids.

34. What is the function of taste receptors?

(A) Detect chemicals (taste)
(B) Detect light
(C) Detect sound
(D) Detect pressure

Correct Answer: A

Explanation: Taste receptors are chemoreceptors located in taste buds on the surface of the tongue.

35. Which type of receptors detect pain?

(A) Mechanoreceptors
(B) Nociceptors
(C) Thermoreceptors
(D) Photoreceptors

Correct Answer: B

Explanation: Nociceptors — this correctly answers the question.

36. A patient has a condition that causes demyelination of neurons. Which of the following would be the most likely consequence?

(A) Faster nerve impulse transmission
(B) Increased neurotransmitter release
(C) Slower nerve impulse transmission
(D) Increased synaptic delay

Correct Answer: C

Explanation: Slower nerve impulse transmission — this correctly answers the question.

37. A patient has a blockage of sodium channels in a nerve. Which of the following would be most affected?

(A) Repolarization
(B) Resting potential
(C) Synaptic transmission
(D) Depolarization

Correct Answer: D

Explanation: Depolarization is caused by the influx of Na□ ions through sodium channels; blockage would impair depolarization.

38. A patient has a condition that causes excessive neurotransmitter release at a synapse. Which of the following would most likely occur?

(A) Increased nerve impulse transmission
(B) Decreased nerve impulse transmission
(C) Decreased action potential generation
(D) Increased synaptic delay

Correct Answer: A

Explanation: Increased nerve impulse transmission — this correctly answers the question.

39. A patient has damage to the cerebellum. Which of the following would be most affected?

(A) Thinking and memory
(B) Balance and coordination

(C) Heart rate and breathing
(D) Vision

Correct Answer: B

Explanation: Balance and coordination — this correctly answers the question.

40. A patient has damage to the medulla oblongata. Which of the following would be most critical?

(A) Loss of vision
(B) Loss of hearing
(C) Loss of breathing and heartbeat control
(D) Loss of memory

Correct Answer: C

Explanation: The medulla controls automatic functions such as heartbeat, blood pressure, respiration, and swallowing.

41. A patient has a condition that affects the parasympathetic division. Which of the following would most likely occur?

(A) Decreased heart rate
(B) Increased blood pressure
(C) Increased breathing rate
(D) Increased heart rate

Correct Answer: D

Explanation: Increased heart rate — this correctly answers the question.

42. A patient has a condition that affects the sympathetic division. Which of the following would most likely occur during an emergency?

(A) Decreased ability to respond to stress
(B) Increased ability to respond to stress
(C) Increased digestion
(D) Decreased heart rate

Correct Answer: A

Explanation: The sympathetic division prepares the body for fight or flight; if affected, the body's ability to respond to stress would decrease.

43. Which of the following correctly describes the pathway of a reflex arc?

(A) Receptor → motor neuron → interneuron → sensory neuron → effector
(B) Receptor → sensory neuron → interneuron → motor neuron → effector
(C) Effector → motor neuron → interneuron → sensory neuron → receptor
(D) Receptor → interneuron → sensory neuron → motor neuron → effector

Correct Answer: B

Explanation: Receptor → sensory neuron → interneuron → motor neuron → effector — this correctly answers the question.

44. A patient has a condition that causes increased potassium leakage from neurons. Which of the following would most likely occur?

(A) Increased resting membrane potential
(B) Increased depolarization
(C) Decreased resting membrane potential
(D) Increased action potential frequency

Correct Answer: C

Explanation: Decreased resting membrane potential — this correctly answers the question.

45. Which of the following correctly describes the role of local circuits in saltatory conduction?

(A) They produce myelin
(B) They break down neurotransmitters
(C) They maintain resting potential
(D) They trigger depolarization of the next node

Correct Answer: D

Explanation: They trigger depolarization of the next node — this correctly answers the question.

46. A patient has a condition that causes increased synaptic delay. Which of the following would most likely occur?

(A) Slower nerve impulse transmission
(B) Faster nerve impulse transmission
(C) Increased neurotransmitter release
(D) Increased action potential frequency

Correct Answer: A

Explanation: Synaptic delay is the time taken for the impulse to cross the synapse; increased delay would slow down nerve impulse transmission.

47. Which of the following correctly describes the effect of a subthreshold stimulus?

(A) It produces an action potential
(B) It does not produce an action potential
(C) It increases the resting potential
(D) It decreases the threshold

Correct Answer: B

Explanation: If a stimulus is not capable to excite or fails to arise any response, it is called subthreshold stimulus.

48. A patient has a condition that affects the hippocampus. Which of the following would most likely be affected?

(A) Balance and coordination
(B) Heart rate
(C) Memory
(D) Vision

Correct Answer: C

Explanation: The hippocampus is important in converting short-term memory into long-term memory.

49. A patient has a condition that affects the amygdala. Which of the following would most likely be affected?

(A) Memory
(B) Heart rate
(C) Vision
(D) Emotions

Correct Answer: D

Explanation: Emotions — this correctly answers the question.

50. Which of the following correctly describes the role of the hypothalamus?

(A) It maintains homeostasis and controls the pituitary gland
(B) It controls balance and coordination
(C) It controls vision
(D) It controls hearing

Correct Answer: A

Explanation: The hypothalamus maintains homeostasis and controls the pituitary gland, serving as a link between the nervous and endocrine systems.