

Neural Control and Coordination

1. **Assertion (A):** Associative area are neither sensory nor motor.
Reason (R): Associative area is a type of memory bank where information's get stored.

 - (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
2. **Assertion (A):** $\text{Na}^+ - \text{K}^+$ pump always remains open/active except depolarization.
Reason (R): $\text{Na}^+ - \text{K}^+$ pump always try to maintain. Resting stage or undisturbed stage.

 - (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
3. **Assertion (A):** Human's brain having highly folded structure in gray matter as gyri & sulci.
Reason (R): Gyri & sulci are also present in cerebellum.

 - (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
4. **Assertion (A):** Chemical synapse always show unidirectional flow of nerve impulse act as one way valve.
Reason (R): Chemical energy in the form of neuro transmitter transmits from pre synaptic membrane to post synaptic membrane.

 - (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
5. **Assertion (A):** Medulla ablongata causes reflex actions like vomiting, Coughing and sneezing.
Reason (R): Medulla has many nerve cells which control autonomic reflexes.

 - (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
6. **Assertion (A):** Number of Neuron's always remains constant due to lack of centriole.
Reason (R): Neuron shows axoplasmic growth in which length of axon or neuron increases.

 - (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
7. **Assertion (A):** Schwann cells are present around myelinated & unmyelinated axon.
Reason (R): Schwann cell has functions of myelinogenes in PNS & function as packaging cell in autonomous neural system and somatic neural system.

 - (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
8. **Assertion (A):** Cerebellum is large, lobed and convoluted in active animals.
Reason (R): Cerebellum coordinates voluntary movements and helps in maintenance of posture and equilibrium.

 - (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false



9. **Assertion (A):** Active transport results in solute movement against a concentration gradient.

Reason (R): Active transport of Na^+ and K^+ is energized by ATP.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

10. **Assertion (A):** A neurotransmitter crosses the synapse and attaches to receptors on the post synaptic cell.

Reason (R): Depending on the neurotransmitter, it may excite or inhibit the post synaptic cell.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

11. **Assertion (A):** Transmission of a nerve impulse across a synapse is brought about by a neurotransmitter.

Reason (R): A neurotransmitter is necessary to transmit a nerve impulse across a synapse because there is a small gap, the synaptic cleft, between the two neurons at the synapse.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

12. **Assertion (A):** Stimulus is interpreted by the brain and not by sense organs.

Reason (R): Sense organs act as transducers, transforming the stimulus into impulse.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

13. **Assertion (A):** Tympanic membrane separates the external ear from the middle ear.

Reason (R): Tympanic membrane transmits vibrations (pressure waves in air) to the internal ear via ear ossicles of middle ear.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

14. **Assertion (A):** Cornea causes the maximum refraction of the light rays. This places the image approximately at the retina.

Reason (R): Cornea has a flat surface.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

15. **Assertion (A):** The receptor cells in the organ of Corti transmit impulses to the cerebral cortex to cause sensation of sound.

Reason (R): The organ of Corti is located in the utricle.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

16. **Assertion (A):** Medulla oblongata is very important for survival

Reason (R): Medulla oblongata regulates all involuntary activities.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false



17. **Assertion (A):** Cerebral hemisphere is second most developed part of the brain.

Reason (R): Cerebrum is the largest part of the body.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

18. **Assertion (A):** All spinal nerves are mixed type.

Reason (R): Dorsal root is motor type while ventral root is sensory type.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

19. **Assertion (A):** In humans surface of cerebellum is more thick & folded.

Reason (R): This increases the surface the surface area for intelligency.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

20. **Assertion (A):** Impulse transmission across a chemical synaps is always faster than that across electrical synaps.

Reason (R): Electrical synapses are rare in our body.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

21. **Assertion (A):** Velocity of impulse in myelinated nerve fibre is more than non myelinated nerve fibre

Reason (R): Myelinated nerve fibre is having Schwann cells covering but non myelinated nerve fibre do not consist Schwann cells.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

22. **Assertion (A):** A cerebellum is related with skillful voluntary movement and involuntary activity like body balance, equilibrium etc.

Reason (R): It is part of hind brain and it is situated behind the pons.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

23. **Assertion (A):** Withdrawal reflex is controlled by spinal cord.

Reason (R): Initially cerebrum is involved and require alertness for perform this reflex.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

24. **Assertion (A):** In emergency condition. Catecholamines are secreted by adrenal medulla.

Reason (R): Sympathetic nervous system is stimulated & it directly effect the adrenal medulla & prepare the animal in emergency condition

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false



25. Assertion (A): Amygdala body is a part of limbic system.

Reason (R): It controls the mood especially anger and rage.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

26. Assertion (A): Threshold stimulus is required for propagation of impulse

Reason (R): Threshold stimulus produce action potential therefore conduction of impulse occur.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

27. Assertion (A): Speed of nerve impulse is faster on medullated nerve fibres, than nonmedullated nerve fibres.

Reason (R): In medullated nerve fibres nerve impulses are conducted in a saltatory manner.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

28. Assertion (A): Neuron is the longest cell of human body.

Reason (R): It contain dendrites and axon.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

29. Assertion (A): Nerve impulse conduction is one way conduction.

Reason (R): Neurotransmitters are only present at axon terminals.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

30. Assertion (A): In a myelinated nerve fibre the impulse jumps from one node of Ranvier to the other.

Reason (R): Exchange of ions takes place only at node of Ranvier.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

31. Assertion (A): Minimum stimulus required to open Na^+ VGC as the result of which depolarization occurs, is called action potential.

Reason (R): Average value of RMP is +70 mV.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

32. Assertion (A): The imbalance in concentration of Fe^{+2} , Ca^{+2} , Mg^{+2} , Na^+ , K^+ and proteins generate action potential.

Reason (R): To maintain the unequal distribution of Na^+ and K^+ the neurons use electrical energy.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false



33. Assertion (A): A real and inverted image is obtained on the retina.

Reason (R): Maximum refraction of light is caused by aqueous humor and lens.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

34. Assertion (A): Blind spot of the retina of the eye is devoid of the ability of vision.

Reason (R): The photoreceptor rods & cone cells are absent in the blind spot.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

35. Assertion (A): Accommodation power is present in human eye.

Reason (R): It depends on the sliding of lens forward and backward.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

36. Assertion (A): Tympanic membrane separates the external ear from the middle ear.

Reason (R): Tympanic membrane transmits vibrations to the internal ear via ear ossicles of middle ear.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

37. Assertion (A): Vitamin-A deficiency produces night blindness

Reason (R): Photosensitive pigment rhodopsin is synthesised from vitamin A.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

38. Assertion (A): The auditory ossicles help in hearing.

Reason (R): Auditory ossicles maintain the balance of air pressure between two sides of the ear drum.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

39. Assertion (A): The cristae and maculae are the specific receptors of the vestibular apparatus.

Reason (R): Cristae and maculae maintain balance and body posture.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

40. ASSERTION (A): The axonal membrane of the neuron during resting stage is more permeable to sodium ions (Na^+) and nearly impermeable to potassium ions (K^+)

REASON (R): In resting state neurons does not conduct any impulse, so these don't require ATP to remain in a resting state.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

41. **Assertion (A):** When light strikes the retina, potential differences are generated in photoreceptors
Reason (R): Light induces dissociation of the retinal from opsin resulting in changes in the structure of the opsin which in turn causes membrane permeability changes.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false



Directions: In the following questions, a statement of assertion is followed by a statement of reason.

Mark the correct choice as:

- (a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- (b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- (c) If Assertion is true but Reason is false.
- (d) If both Assertion and Reason are false.

42. **Assertion :** The chemical stored in the synaptic vesicles are termed as neurotransmitters.

Reason : Synaptic vesicles release these chemicals in the synaptic cleft.

43. **Assertion:** Transmission of nerve impulse across a synapse is accomplished by neurotransmitters.

Reason : Transmission across a synapse usually requires neurotransmitters because there is a small space, i.e., synaptic cleft, that separates one neuron from another.

44. **Assertion :** The axonal membrane of the neuron is more permeable to sodium ion (Na^+) and nearly impermeable to potassium (K^+).

Reason : In a resting state, neuron conducts impulses.

45. **Assertion :** Medulla oblongata causes reflex actions like vomiting, coughing and sneezing.

Reason : It has many nerve cells which control autonomic reflexes.

46. **Assertion :** A cerebellum is related with skilful voluntary movement and involuntary activity like body balance, equilibrium, etc.

Reason : It is a part of hind brain and is situated behind the pons.

47. **Assertion:** When all the three types of cones are stimulated equally, a mosaic of red, green and blue lights is produced.

Reason: Twilight or scotopic vision is produced by cones.

48. **Assertion:** The inner ear contains three ossicles (malleus, incus and stapes) which are attached to one another in a chain-like fashion.

Reason: The stapes is attached to the tympanic membrane and the malleus is attached to the oval window of the cochlea.

49. **Assertion:** Vestibular apparatus helps us in maintaining balance of body and posture.

Reason: Due to the arrangement of semicircular canals of vestibular apparatus, movement of head in any direction will stimulate sensory cells to maintain dynamic equilibrium.

50. **Assertion:** The Eustachian tube helps in equalising the pressures on either sides of the ear drum.

Reason: The Eustachian tube connects the middle ear cavity with the pharynx.

51. **Assertion:** The resting membrane of the neuron exhibit polarity of charges.

Reason: The outer surface of the axonal membrane possesses a negative charge while its inner surface becomes positively charged.

52. **Assertion:** Nerve fibre can become excited through touch, smell, pressure and chemical changes and there is a change in polarity.

Reason: It is called action potential.

53. **Assertion:** Reflex arc comprises of at least one afferent neuron, one efferent neuron and a part of PNS.

Reason: The efferent neuron receives signal from a sensory organ and transmits the impulse via a ventral nerve root into the PNS.

54. **Assertion:** Neuroglial cells are known as the packing cells of brain.

Reason: A type of neuroglial cells forms the myelin sheath around axon.

ANSWER KEY																				
Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	1	1	2	1	1	1	1	1	2	2	1	1	2	3	3	3	4	3	4	2
Que.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	3	2	3	1	1	1	1	2	1	1	4	4	3	1	3	2	1	3	2	3
Que.	41																			
Ans.	1																			

42.	43.	44.	45.	46.	47.	48.	49.	50.	51.	52.	53.	54.				
B	A	D	A	B	D	D	A	A	C	B	D	A*				