CHAPTER

21

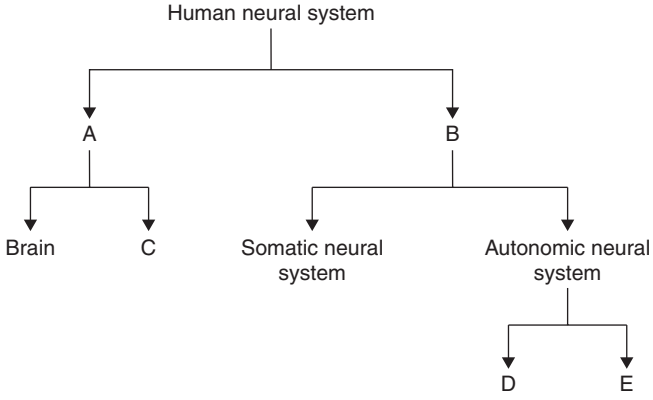
Neural Control and Co-ordination

PRACTICE QUESTIONS

Human Neural System

1. Select the incorrect statement:
(a) Coordination is the process through which two or more organ interact and complement the function of one another.
(b) Neural system provides on organized network of point to point connection for quick coordination.
(c) Neural organization is complex in lower invertebrates.
(d) Vertebrates have more developed neural system.

2.



Identify A, B, C, D and E:
(a) A–Central Nervous System (CNS), B–Peripheral Nervous System (PNS), C–Spinal cord, D–Sympathetic Neural System, E–Parasympathetic Neural System
(b) A–Peripheral Nervous System (PNS), B–Parasympathetic Neural System, C–Central Nervous System (CNS), D–Sympathetic Neural System, E–Spinal cord
(c) A–Parasympathetic Neural System, B–Spinal cord, C–Central Nervous System (CNS), D–Sympathetic Neural System, E–Peripheral Nervous System (PNS)
(d) A–Central Nervous System (CNS), B–Spinal cord, C–Peripheral Nervous System (PNS), D–Sympathetic Neural System, E–Parasympathetic Neural System

3. Somatic neural system transmits impulse to
(a) Skeletal muscles (b) Involuntary organs
(c) Smooth muscles (d) All of these

4. Which of the following lacks a neural system?
(a) Hydra (b) Silver fish
(c) Spongia (Sponges) (d) Ophiura

5. Nervous system of hydra is composed of
(a) Ganglia chain
(b) Vertical ganglion chain interconnected by commissure
(c) Network of nerves
(d) Brain

6. Nissl's granules are found in all except
(a) Cyton (b) Dendrites
(c) Axon (d) Cell body

7. Which of the following system relays impulse from CNS to skeletal muscles?
(a) Somatic neural system
(b) Sympathetic neural system
(c) Parasympathetic neural system
(d) Autonomic neural system

8. Dendrites transmit impulse ____ cell body and axon transmits impulse ____ cell body.
(a) towards, away from (b) away, towards
(c) towards, towards (d) away, away

9. Bipolar axons are found in
(a) Retina of eye (b) Cerebral cortex
(c) Mesencephalon (d) Embryonic stage

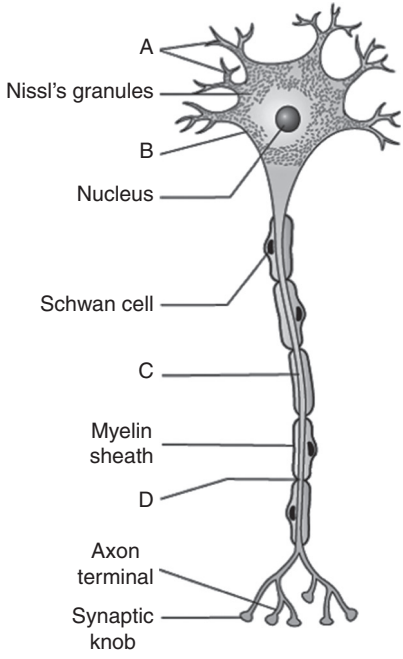
10. Unipolar axons are found in
(a) Respiratory epithelium (b) Retina
(c) Embryo (d) Cerebral cortex

11. Schwann cell is absent in
(a) Myelinated neuron (b) Non myelinated
(c) Astrocytes (d) Both (b) and (c)

12. Neuron can
(a) Detect stimuli (b) Receive stimuli
(c) Transmit stimuli (d) All of these

13. Neuron is a _____ structure composed of three major parts cell body _____ and axon.
(a) Macroscopic, dendrites
(b) Microscopic, dendrites
(c) Microscopic, cyton
(d) Microscopic, soma

14. Question A and B is related to digram given below.



Structure of a neuron

A) Which part do not contain Nissl's granule?
(a) A (b) B (c) C (d) All of these
B) Which path of transmission is correct?
(a) A → B → C (b) B → A → C
(c) C → B → A (d) B → A → B → C

15. Match the Column:

Column I		**Column II**
A. Unipolar	–	1. Cell body with one axon only, found usually in the embryonic stage.
B. Bipolar	–	2. Cell body with one axon and two or more dendrites, found in cerebral cortex.
C. Multipolar	–	3. Cell body with one axon and one dendrite, found in retina of eye.

(a) A–1, B–3, C–2 (b) A–2, B–1, C–3
(c) A–3, B–2, C–1 (d) A–1, B–2, C–3

16. Myelinated nerve fibre is found in
(a) Spinal nerve (b) Cranial nerve
(c) Both (a) and (b) (d) None of these

17. Unmyelinated nerve fibres are commonly found in
(a) ANS (b) Somatic neural system
(c) Both (a) and (b) (d) None of these

Central Nervous System

18. The outermost of the 3 cranial meninges is
(a) Arachnoid (b) Dura (c) Pia (d) Sclera

19. Brain stem is formed by
(a) Fore brain (b) Mid brain (c) Hind brain (d) Both (b) and (c)

20. Right and left cerebral hemispheres are connected via
(a) Corpus striatum (b) Corpus callosum
(c) Thalamus (d) Hippocampus

21. Forebrain consist of
(a) Cerebrum (b) Thalamus (c) Hypothalamus (d) All of these

22. The cerebrum is made up of how many cerebral hemisphere?
(a) 1 (b) 2 (c) 3 (d) 4

23. Select the incorrect statement:
(a) Cerebral cortex, greyish in appearance thrown into prominent folds known as sulci and gyri.
(b) Concentrated neuron cell body gives grey color to the cerebral cortex.
(c) Fibres of the tract, covered with myelin sheath, constitute inner part of cerebral hemisphere.
(d) Cerebrum is wrapped around the structure called medulla.

24. Cerebral cortex contains
(a) Sensory area (b) Motor area
(c) Large association area (d) All of these

25. The association area in cerebral cortex is responsible for
(a) Inter sensory association (b) Memory
(c) Communication (d) All of these

26. The major coordinating centre for sensory and motor signaling is
(a) Thalamus (b) Hypothalamus (c) Medulla (d) Pons

27. Hypothalamus contain the brain centre which controls the
(a) Body temperature (b) Urge for eating
(c) Urge for drinking (d) All of these

28. Which of the following is true about hypothalamus?
(a) Situated at the base of thalamus
(b) Contains neurosecretory cell
(c) It contains the centre for thermoregulation
(d) All of these

29. Limbic system consists of
(a) Amygdala (b) Hippocampus (c) Both (a) and (b) (d) None of these

30. The part of brain located between the thalamus, hypothalamus of fore brain and pons is known as
(a) Mid-brain (b) Hind-brain (c) Limbic system (d) All of these

31. Which of the following is true about midbrain?
(a) A canal called cerebral aqueduct passes through the mid-brain.
(b) The dorsal portion of mid-brain consists of four round swelling called corpora quadrigemina.
(c) It forms the part of brain stem.
(d) All the above

32. The hind-brain consists of
(a) Pons (b) Medulla oblongata
(c) Cerebellum (d) All of these

33. Hypothalamus controls
(a) Body's thermostat (b) Respiration
(c) Gastric secretions (d) All of these

34. Limbic system controls
(a) Sexual behaviour (b) Motivation
(c) Affection (d) All of these

35. Corpora quadrigemina are present on _____ portion of Mesencephalon (midbrain).
(a) Anterior (b) Dorsal (c) Ventral (d) Lateral

36. Which of the following is false about hind-brain?
(a) Pons, a part of it consist of fibre tracts that interconnects different regions of brain.
(b) The cerebellum part of it has very convoluted surface to accommodate many neurons.
(c) Medulla of this part is connected to the spinal cord.
(d) The hind-brain is known for regular excitement, pleasure, rag and fear.

37. Medulla contains the centre for
(a) Respiration (b) Cardiovascular reflex
(c) Gastric Secretion (d) All of these

38. Which of the following consists of fibre tracts interconnecting the different regions of brain?
(a) Cerebellum (b) Pons varoli (c) Medulla (d) All of these

39. Which of the following helps in the regulation of respiration?
(a) Medulla (b) Cerebral cortex (c) Pons (d) Both (a) and (c)

40. Reflex action is under
(a) CNS (b) Spiral cord
(c) Peripheral Nervous Stimulation (d) Voluntary response

41. The dorsal nerve root ganglion is
(a) Bipolar (b) Unipolar (c) Pseudounipolar (d) Multipolar

42. In spiral cord of humans, the grey matter is _____ shaped.
(a) Circular (b) Irregular (c) Butterfly (d) None of these

43. White matter is _____ in brain and _____ in spiral cord (in case of humans)
(a) Outside, inside (b) In, out (c) In, in (d) Out, out

44. Resting axonal membrane is
(a) Unpolarized (b) Unpolarized and more permeable to K^+
(c) Polarized and more permeable to Na^+ (d) Polarized and more permeable to K^+

45. Na/K pumps transports
(a) $3Na^+$ out for $2K^+$ in (b) $3Na^+$ in for $2K^+$ out
(c) $2Na^+$ out for $3K^+$ in (d) $2Na^+$ in for $3K^+$ out

46. Which of the following is true about neural membrane?
(a) Different type of ion channels present.
(b) Ion channels are selectively permeable.
(c) Impermeable to negatively charged protein present in axoplasm.
(d) All the above

47. Axoplasm have (polarized)
(a) High K^+ ion (b) Low Na^+ ion
(c) Negatively charged proteins (d) All of these

48. The electrical potential difference across the resting plasma membrane is called as
(a) Spike potential (b) Action potential
(c) Resting potential (d) All of these

49. Depolarization occurs due to
(a) Influx of Na^+ (b) Eflux of Na^+ (c) Influx of K^+ (d) Eflux of K^+

50. The correct sequence for depolarization and repolarization is
(A) Stimulus applied at a site on polarized membrane
(B) Increase the permeability for Na^+
(C) Generation of A.P.(Action Potential)
(D) Increase the permeability for K^+
(E) Restoration of membrane potential
(a) $A \rightarrow B \rightarrow C \rightarrow D \rightarrow E$ (b) $B \rightarrow A \rightarrow C \rightarrow D \rightarrow E$
(c) $A \rightarrow D \rightarrow C \rightarrow B \rightarrow E$ (d) $A \rightarrow B \rightarrow D \rightarrow C \rightarrow E$

51. Unidirectional transmission of the nerve impulse is maintained by
(a) Interneurons (b) Myelin sheath
(c) Synapse (d) Membrane polarity

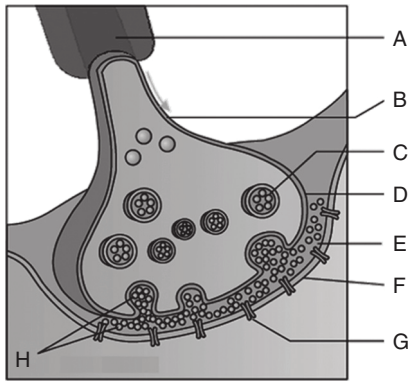
52. Select the total number of true statements from the following.
1) There are two types of synapses, namely electrical synapses and chemical synapses.
2) Electrical synapses are rare in our system.
3) At chemical synapse, the membranes of pre- and post-synaptic neuron are in very close proximity.
4) Transmission of an impulse across electrical synapses is very similar to impulse conduction along a single axon.
5) At a chemical synapse, the membrane of the pre- and post-synaptic neurons are separated by a fluid-filled space called synaptic cleft.
(a) 2 (b) 3 (c) 4 (d) 5

53. Chemicals called _____ are involved in the transmission of impulses at chemical synapse.
(a) Neurohormones (b) Neurotransmitters
(c) Receptors (d) Interferon

54. Which element ion helps in releasing Ach at synaptic cleft?
(a) Na^+ (b) K^+ (c) Ca^{+2} (d) PO_4^{3-}

55. The new potential developed on post-synaptic membrane is
(a) Excitatory always
(b) Inhibitory always
(c) May be excitatory or inhibitory
(d) Neither excitatory nor inhibitory

56. Identify A to H in the given figure.



(a) A—Neurotransmitters, B—Pre-synaptic membrane, C—Receptors, D—Axon, E—Synaptic vesicles, F—Axon terminal, G—Synaptic cleft, H—Post-synaptic membrane
(b) A—Axon, B—Axon terminal, C—Synaptic vesicles, D—Pre-synaptic membrane, E—Synaptic cleft, F—Post-synaptic membrane, G—receptors, H—Neurotransmitters
(c) A—Receptors, B—Post-synaptic membrane, C—Pre-synaptic membrane, D—Axon terminal, E—Neurotransmitters, F—Synaptic cleft, G—Synaptic vesicles, H—Axon
(d) A—Axon terminal, B—Neurotransmitters, C—Synaptic vesicles, D—Axon, E—Pre-synaptic membrane, F—Post-synaptic membrane, G—Synaptic vesicles, H—Synaptic cleft

57. Reflex action
(a) Occurs involuntarily
(b) Requires the involvement of CNS
(c) Protective
(d) All of these

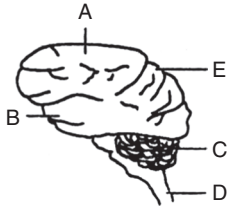
58. Smallest reflex consists of
(a) Afferent neuron (Receptor)
(b) Efferent neuron (effector or excitor)
(c) Both (a) and (b)
(d) None of these

59. In reflex action, the reflex arc is formed by
(a) Muscle, receptor, brain
(b) Brain, spinal cord, muscle
(c) Receptor, spinal cord, muscle
(d) Receptor, muscle, spinal cord

60. Which of the following are due to reflex action?
(a) Vomiting
(b) Sneezing
(c) Coughing
(d) All of these

61. Which of the following are example of reflexes?
(a) Knee-jerk reflex
(b) Corneal reflex
(c) Papillary reflex
(d) All of these

62. In the diagram of the lateral view of the human brain, the parts are indicated by alphabets. Choose the answer in which these alphabets have been correctly matched with the parts which they indicate?



(a) A–Temporal lobe, B–Parietal lobe, C–Cerebellum, D–Medulla oblongata, E–Frontal lobe
(b) A–Frontal lobe, B–Temporal lobe, C–Cerebrum, D–Medulla oblongata, E–Occipital lobe
(c) A–Temporal lobe, B–Parietal lobe, C–Cerebrum, D–Medulla oblongata, E–Frontal lobe
(d) A–Frontal lobe, B–Temporal lobe, C–Cerebellum, D–Medulla oblongata, E–Occipital lobe

63. The site for processing of vision, hearing, speech, memory, intelligence, emotions and thoughts is
(a) Brain (b) Hear
(c) Lungs (d) Kidney

64. Eyes are located in
(a) Eye orbits (b) Depression in sphenoid bone
(c) Both (a) and (b) (d) None of these

65. Choroid is blue due to _____
(a) Lack of O_2 in tissues (b) Due to pigment
(c) Excess of blood vessels (d) None of these

66. Choroid thickens anteriorly to form
(a) Iris (b) Ciliary body
(c) Suspensory ligaments (d) None of these

67. The diameter of pupil is regulated by
(a) Lens (b) Ciliary muscles
(c) Muscles of iris (d) All of these

68. Cells located in retina are
(a) Photoreceptor cells (b) Bipolar cell
(c) Ganglion cells (d) All of these

69. Layers in the wall of eyeballs from inside outwards are
(a) Retina, choroid, sclerotic (b) Sclerotic, choroid, retina
(c) Choroid, retina, sclerotic (d) Choroid, sclerotic, retina

70. Which layer of an eyeball wall contains abundant blood vessels?
(a) Lens (b) Retina (c) Choroid (d) Sclerotic

71. Iris is a part of
(a) Choroid only (b) Retina only
(c) Sclera and choroid (d) Choroid and retina

72. The size of aperture of the pupil of one eye is controlled by
(a) Iris (b) Retina (c) Cornea (d) Conjunctiva

73. Eye lens of a man is
(a) Biconcave (b) Biconvex (c) Concave (d) Convex

74. Cornea is a transparent part of
(a) Choroid (b) Sclera (c) Conjunctiva (d) Retina

75. The second layer of the eyeball is called
(a) Choroid (b) Retina (c) Cornea (d) Sclera

76. The iris of the eye is an extension of
(a) Cornea (b) Sclerotic (c) Retina (d) Choroid

77. The suspensory ligament (Zonule of Zinn) is a part of
(a) Tongue (b) Brain (c) Heart (d) Eye

78. The choroid layer is thin over the _____ of the eye ball
(a) Anterior two-third (b) Posterior two-third
(c) Lateral two-third (d) Posterior one-third

79. Find out the incorrect statement:
(a) Lens is a transparent and crystalline structure.
(b) Iris is pigmented and opaque layer.
(c) The aperture surrounded by iris is called pupil.
(d) Twilight vision is the function of cones.

80. Aqueous humor is present
(a) In front of the retina (b) In front of cornea
(c) Behind the conjunctiva (d) In front of lens

81. Retinal cells involved in colour vision are
(a) Cones (b) Rods (c) Neurons (d) Neuroglial cells

82. Which of the following is not a basic colour in trichromatic vision?
(a) Red (b) Yellow (c) Green (d) Blue

83. Anterior chamber of the eye is the space between
(a) Cornea and lens (b) Cornea and iris (c) Lens and retina (d) Lens and iris

84. Which of the following passes from lens to blindspot?
(a) Eustachian canal (b) Canal of Schlemm
(c) Hyaloid canal (d) Semicircular canal

85. Colour vision in man is
(a) Trichromatic (b) Bichromatic (c) Monochromatic (d) Achromatic

86. Quantum of light entering the eye through the pupil is dependent on
(a) Ciliary body (b) Lens (c) Retina (d) Iris

87. Rhodopsin is a constituent of
(a) Choroid (b) Sclera (c) Cornea (d) None

88. In nocturnal birds, the retina mostly contains
(a) Cones (b) Rods
(c) Both in equal numbers (d) None of these

89. Macula lutea is located
(a) In the middle of retina (b) Below lens
(c) Below pupil (d) At posterior polylateral to blind spot

90. Photopic vision is associated with
(a) Rods (b) Cones (c) Both (a) and (b) (d) None of these

91. Retina is the most sensitive at
(a) Optic disc (b) Periphery (c) Macula lutea (d) Fovea centralis

92. The aperture controlling light passage in the eye is
(a) Pupil (b) Sclerotic (c) Blindspot (d) Iris

93. The space between cornea and lens is
(a) Aqueous chamber (b) Vitreous chamber
(c) Canal of Schlemm (d) Fovea centralis

94. Cones are sensitive to
(a) Dim light only (b) Bright light only
(c) Both dim and bright light (d) None of these

95. Colour is perceived by
(a) Rods in retina (b) Cones in retina
(c) Corneal-lens complex (d) Lens

96. Rhodopsin (visual purple) of the eye will require
(a) Guava (b) Carrot (c) Mango (d) Wheat

97. Area of the most acute vision in the eye where sharp and bright image formed is
(a) Yellow spot (b) Blindspot (c) Pupil (d) Lens

98. An area of the retina which does not have rods or cones are
(a) Red spot (b) Blue spot (c) Blind spot (d) Black spot

99. Vitamin A combines with a protein in the retina to produce
(a) Glaucoma (b) Night blindness
(c) Rhodopsin (d) Colour blindness

100. The fovea is a _____ portion of the _____
(a) Thick-out, sclera (b) Thin-out, choroid
(c) Thin-out, retina (d) Thick-out, retina

101. When all three types of cones are stimulated equally, a sensation of _____ light is produced?
(a) Black (b) White
(c) Blue (d) Green

102. Select the incorrect matching:

	Part		Function
(a)	Optic nerve	–	Carry impulse to visual cortex
(b)	Cones	–	Colour vision
(c)	Cornea and lens	–	Focusing of light on retina
(d)	Pupil	–	Generate action potential

103. Vitreous chamber is filled with
(a) Transparent sol called vitreous humour
(b) Transparent gel called vitreous humour
(c) Opaque sol called vitreous humour
(d) Opaque gel called vitreous humour

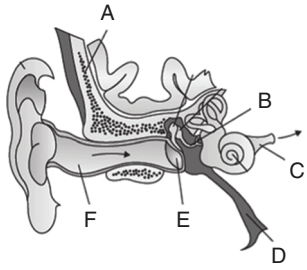
104. Select the incorrect statement from the following:
(a) Rhodopsin is also known as visual purple.
(b) Rods contain a purplish-red protein, which in turn contains the derivative of Vitamin A.
(c) In human eye three type of cones are present.
(d) At fovea of retina, the resolution (visual acuity) is minimum.

105. The location at which Optic nerve leaves the eye balls is
(a) Slightly below the posterior pole of eye ball
(b) Slightly above the posterior pole of eye ball
(c) Anterior pole of eye ball
(d) Macula lutea

106. Arrange the following steps of mechanism of vision in order.
(1) Light induces dissociation of the retinal from opsin.
(2) Change in the structure of opsin.
(3) Change in membrane permeability.
(4) Potential differences are generated in photoreceptor cells.
(5) Generation of AP is ganglion cell through bipolar cells.
(6) AP is transmitted via optic nerve to visual cortex.
(7) At visual cortex, nerve impulses are analysed and the image formed on retina is recognized based on the earlier memory and experience.
(8) Focusing of visible light on retina.
(a) 8,1,2,3,4,5,6,7
(b) 8,1,7,2,6,3,5,4
(c) 1,2,3,4,5,6,7,8
(d) 8,7,6,5,4,3,2,1

107. Ear performs which of the following sensory functions?
(A) Vision
(B) Olfaction
(C) Hearing
(D) Maintenance of body balance
(a) A, B, C
(b) B and C Only
(c) C and D Only
(d) C Only

108. Identify A to F in the given figure.



(a) A–Cochlear nerve, B–Incus, C–Eustachian tube, D–Cochlea, E–External auditory canal, F–Tympanic membrane
(b) A–External auditory canal, B–Eustachian tube, C–Temporal bone, D–Steps in oval window, E–Tympanic membrane, F–Cochlear nerve
(c) A–Cochlea, B–Tympanic membrane, C–Incus, D–Cochlear nerve, E–Eustachian tube, F–External auditory canal
(d) A–Temporal bone, B–Steps in oval window, C–Cochlear nerve, D–Eustachian tube, E–Tympanic membrane, F–External auditory canal

109. Anatomically the ear can be divided into how many major sections?
(a) 1 (b) 2 (c) 3 (d) 4

110. Ear is divided into
(a) Outer ear (b) Middle ear (c) Inner ear (d) All of these

111. Tympanic membrane consists of
(a) Skin on outside (b) Connective tissue in middle part
(c) Mucus membrane on inside (d) All of these

112. The _____ is attached to the tympanic membrane and the _____ is attached to the oval window of the cochlea.
(a) Malleus, Incus (b) Incus, Stapes (c) Malleus, Stapes (d) Stapes, Malleus

113. Select the incorrect statement:
(a) Eustachian tube connects the middle ear cavity with the pharynx.
(b) The eustachian tube helps in equalizing the pressure on either sides of ear drum.
(c) Oval window is a part of cochlea.
(d) The ear ossicle decreases the efficiency of transmission of sound waves to the inner ear.

114. Select the correct matching:
(a) Inner ear ossicle → Malleus, incus and stapes
(b) Scala media → Filled with perilymph
(c) Fluid filled inner ear → Labyrinth
(d) Bony labyrinth → Surrounded by tympanic membrane

115. Inner ear contains all except
(a) Reissner's membrane (b) Basilar membrane
(c) Cochlea (d) Stapes

116. Select the total number of true statement from the following:
(1) Scala vestibuli ends at the oval window.
(2) Scala tympani terminates at round window.
(3) Vestibular apparatus is located above cochlea.
(4) Otolith organ consists of saccule and utricle.
(a) 1 (b) 2 (c) 3 (d) 4

117. Vestibular apparatus consists of
(a) Three semicircular canal (b) Saccule
(c) Utricle (d) All of these

118. Specific receptors of the vestibular apparatus responsible for the maintenance of balance of the body and posture is
(a) Macula (b) Crista (c) Organ of corti (d) Both (a) and (b)

119. Each semicircular canal lies in a different plane at _____ angle to each other.
(a) 45^o (b) 60^o (c) 90^o (d) 120^o

120. In man the receptors stimulated by sound waves are
(a) Organ of corti (b) Semicircular canal
(c) Utriculus (d) Sacculus

121. Scala vestibuli is connected with
(a) Scala media (b) Fenestra ovalis
(c) Scala tympani (d) Fenestra rotundus

122. The cochlea of mammalian internal ear is concerned with
(a) Hearing
(b) Balance of body posture
(c) Both (a) and (b)
(d) Perception changes of atmospheric pressure

123. Identify the correct sequence of organs/regions in the organization of human ear as an auditory mechanoreceptor organ.
(a) Pinna–Cochlea–Tympanic membrane–Auditory canal–Malleus–Stapes–Incus–Auditory nerve
(b) Pinna–Auditory canal–Tympanic membrane–Malleus–Incus–Stapes–Cochlea–Auditory nerve
(c) Pinna–Tympanic membrane–Auditory canal–Incus–Malleus–Stapes–Cochlea–Auditory nerve
(d) Pinna–Malleus–Incus–Stapes–Auditory canal–Tympanic membrane–Cochlea–Auditory nerve

124. Internal ear is filled with
(a) Perilymph (b) Endolymph (c) Lymph (d) Both (a) and (b)

125. Reissner's membrane is found in
(a) Cochlea of mammal (b) Eye of mammal
(c) Heart of mammal (d) Nasal duct of mammal

126. In the internal ear, the organ of Corti which bears hair cells is located in
(a) Sacculus (b) Scala media (c) Scala tympani (d) Scala vestibuli

127. Equilibrium of the body is maintained by
(a) Sacculus and cochlea (b) Semicircular canals and utriculus
(c) Eustachian tube (d) Ear ossicles

128. Which of the following senses is affected if the tectorial membrane is removed from human?
(a) Balance (b) Hearing (c) Vision (d) Smell

129. Malleus (hammer shape), incus (anvil shape) and stapes (stirrup shape) are present in
(a) Internal ear of frog (b) Middle ear of human
(c) Eye of rabbit (d) Eye of frog

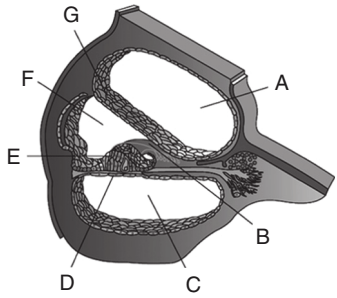
130. The waxy substance that coats the surface of auditory canal is produced by
(a) Harderian glands (b) Meibomian glands
(c) Zeis glands (d) Ceruminous glands (sebaceous gland)

131. Macula in man are present in
(a) Semicircular canals (b) Utriculus
(c) Sacculus (d) Both utriculus and sacculus

132. Which of the following parts in your body is concerned with the sense of balance?
(a) Eustachian tube (b) Cochlea
(c) Eardrum (d) Semicircular canals

133. The fluid present in the semicircular canals of the internal ear of human is
(a) Endolymph (b) Perilymph (c) Lymph (d) Coelomic fluid

134. Identify A, B, C, D, E, F and G in the given figure.



(a) A–Scala vestibuli, B–Tectorial membrane, C–Scala tympani, D–Basilar membrane, E–Organ of corti, F–Scala media, G–Reissner's membrane
(b) A–Scala tympani, B–Reissner's membrane, C–Scala vestibuli, D–Basilar membrane, E–Scala media, F–Organ of corti, G–Tectorial membrane
(c) A–Reissner's membrane, B–Tectorial membrane, C–Scala media, D–Organ of corti, E–Scala vestibuli, F–Scala tympani, G–Basilar membrane
(d) A–Tectorial membrane, B–Scala tympani, C–Reissner's membrane, D–Basilar membrane, E–Scala vestibuli, F–Scala vestibuli, G–Organ of corti

135. Which one of the following is not a part of ear?
(a) Eustachian tube (b) Cone cell
(c) Utriculus (d) Sacculus

136. The base of semicircular canals is swollen and is called _____ which contain a projecting ridges called _____ which ahs hair cells.
(a) Papilla, macula ampullaris (b) Ampulla, crista ampullaris
(c) Ampulla, macula ampullaris (d) Macula, crista ampullaris

137. Otolith organ consist of
(a) Saccule (b) Utricle
(c) Semicircular canal (d) Both (a) and (c)

138. Select the correct statement:
(a) Neural system co-ordinates and integrates functions as well as metabolic and homeostatic activities of all organs
(b) Chemical involved in the transmission of impulse at chemical synapses are always proteins
(c) The electrical potential difference across the resting neural membrane is called the action potential
(d) Organ of Corti influenced by gravity and movement and helps in maintaining balance of the body and posture

ASSERTION AND REASON QUESTIONS

*Read the **assertion** and **reason** carefully to mark the correct option out of the options given below:*

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

139. **Assertion:** The sensation of different colours are produced by various combinations of five types of cones found in our eyes.
Reason: Cones are responsible for vision in dim light.

140. **Assertion:** Nerve impulse can never be transmitted from dendrite or cell body of one neuron to the axon of the next neuron, across a synapse.
Reason: This happens because of the synaptic delay at each synapse.

141. **Assertion:** After hearing a sound, the nerve impulse passes from neurons to the brain.
Reason: The neurons which pass nerve impulses from the body organ to the brain is called afferent neuron.

142. **Assertion:** Cerebrospinal fluid is present throughout the central nervous system.
Reason: CSF has no function.

143. **Assertion:** The cerebellum has very convoluted surface.
Reason: It provides additional space for many more neurons.

144. **Assertion:** Some areas of the brain and spinal cord look white.
Reason: This is because cell bodies of neurons are situated in those areas.

145. **Assertion:** Motor neuron terminates on a motor end plate at the neuromuscular junction.
Reason: Motor endplate acts as receptor for detecting changes in the muscle fibres.

146. **Assertion:** Crista and macula are the specific receptors of vestibular apparatus responsible for the maintenance of balance of the body and posture.
Reason: Cochlea helps in hearing.

147. **Assertion:** Spinal cord has a column of both grey and white matter.
Reason: Grey matter forms the central spinal canal.

148. **Assertion:** All motor neurons are efferent neurons.
Reason: Motor neurons conduct nerve impulses from the spinal cord to the brain.

149. **Assertion:** The chemical stored in the synaptic vesicles are termed as neurotransmitters.
Reason: Synaptic vesicles release these chemicals in the synaptic cleft.

150. **Assertion:** Medulla oblongata causes reflex actions like vomiting, coughing and sneezing.
Reason: It has many nerve cells which controls autonomic reflexes.

151. **Assertion:** Transmission of the nerve impulse across a synapse is accomplished by neurotransmitters.
Reason: Transmission across a synapse usually requires neurotransmitters because there is small space, i.e., synaptic cleft, that separates one neuron from another.

152. **Assertion:** The place in retina from which the optic nerve leaves is known as blind spot.
Reason: Because this place is devoid of photoreceptor cells.

153. **Assertion:** Cornea transplants are successful.
Reason: Cornea is avascular and so there is no reaction of immune system.

154. **Assertion:** Owl can see at night.
Reason: They possess a large number of rods and few cones in their retina.

155. **Assertion:** Vitamin – A deficiency produce night blindness.
Reason: Vitamin – A forms retinal, a component of visual pigments in rods and cones.

156. **Assertion:** Surface of cerebrum is highly folded.
Reason: To increase the area for having more neurons.

157. **Assertion:** Person fails to hear by destroying temporal lobe.
Reason: Temporal lobe having auditory area.

158. **Assertion:** Conditioned reflex requires previous experience.
Reason: It is controlled by cerebrum initially.

159. **Assertion:** In a myelinated nerve fibre the impulse jumps from one node of Ranvier to the other.
Reason: Exchange of ions takes place only at node of Ranvier.

160. **Assertion:** No image is formed at the exit of optic nerve.
Reason: It lacks the receptor cells and is insensitive to light.

161. **Assertion:** Unmyelinated fibres are without myelin sheath.
Reason: Schwann cells are absent in unmyelinated fibres.

162. **Assertion:** Ionic gradient is present across the resting membrane in nerve fibre.
Reason: It is due to active transport of ion by sodium and potassium pump.

163. **Assertion:** Hypothalamus is called thermostat of body.
Reason: Hypothalamus contain centre for thermoregulation.

164. **Assertion:** Cerebral cortex is referred as the white matter.
Reason: It is due to its whitish appearance.

165. **Assertion:** We can equalise pressure on either side of ear drum.
Reason: Eustachian tube connects inner ear with pharynx.

166. **Assertion:** Impulse transmission across an electrical synapse is always faster than that across a chemical synapse.
Reason: At electrical synapses, the membranes of pre- and post-synaptic neurons are in very close proximity.

PREVIOUS YEAR QUESTIONS

1. Select the answer with correct matching of the structure, its location and function.

[A: Structure, B: Location, C: Function]

[AIPMT MAINS 2010]

Structure	Location	Function
(a) Eustachian tube	Anterior part of internal ear	Equalizes air pressure on either sides of tympanic membrane.
(b) Cerebellum	Mid-brain	Controls respiration and gastric secretions.
(c) Hypothalamus	Fore-brain	Controls body temperature, urge for eating and drinking.
(d) Blind spot	Near the place where optic nerve leaves the eye	Rods and cones are present but inactive here.

2. The nerve centres which control the body temperature and the urge for eating are contained in
[AIPMT PRE 2010]

(a) Hypothalamus (b) Pons
(c) Cerebellum (d) Thalamus

3. The purplish red pigment rhodopsin contained in the rods type of photoreceptor cells of the human eyes is a derivative of
[AIPMT PRE 2011]

(a) Vitamin C (b) Vitamin D
(c) Vitamin A (d) Vitamin B

4. When a neuron is in a resting state, i.e., not conducting any impulse, the axonal membrane is
[AIPMT PRE 2011]

(a) Equally permeable to both Na^+ and K^+ ions.
(b) Impermeable to both Na^+ and K^+ ions.
(c) Comparatively more permeable to K^+ ions and nearly impermeable to Na^+ ions.
(d) Comparatively more permeable to Na^+ ions and nearly impermeable to K^+ ions.

5. The human hind-brain comprises three parts, one of which is

[AIPMT PRE 2012]

(a) Spinal cord
(b) Corpus callosum
(c) Cerebellum
(d) Hypothalamus

6. Which part of the human ear plays no role in hearing as such but is otherwise very much required?

[AIPMT PRE 2012]

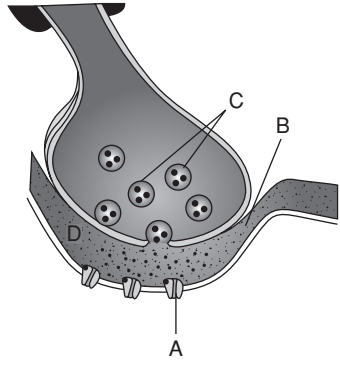
(a) Eustachian tube
(b) Organ of Corti
(c) Vestibular apparatus
(d) Ear ossicles

7. A person entering an empty room suddenly finds a snake right in front of the opening of door. Which one of the following is likely to happen in his neuro-hormonal control system?

[AIPMT PRE 2012]

(a) Sympathetic nervous system is activated releasing epinephrine and norepinephrin efrom adrenal medulla.
(b) Neurotransmitters diffuse rapidly across the cleft and transmit a nerve impulse.
(c) Hypothalamus activates the parasympathetic division of brain.
(d) Sympathetic nervous system is activated releasing epinephrine and the system is activated releasing epinephrine and norepinephrine from adrenal cortex.

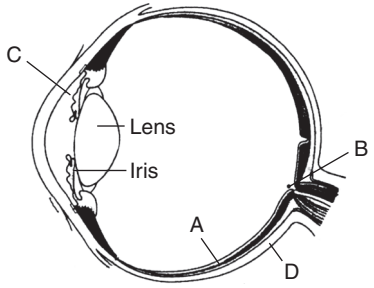
8. A diagram showing axon terminal and synapse is given. Identify correctly at least two of A to D.



[AIPMT 2013]

(a) A – Receptor C – Synaptic vesicles
(b) B – Synaptic connections D – K^+
(c) A – Neurotransmitter B – Synaptic cleft
(d) C – Neurotransmitter D – Ca^{++}

9. The parts A, B, C and D of the human eye are shown in the diagram. Select the option which gives the correct identification along with its function/characteristics.



[AIPMT 2013]

(a) A – Retina – Contains photoreceptors rods and cones
(b) B – Blind spot – Has only a few rods and cones
(c) C – Aqueous chamber – Reflects the light which does not pass through the lens
(d) D – Choroid – Its anterior part forms ciliary body

10. Injury localized to the hypothalamus would most likely disrupt the

[AIPMT 2014]

(a) Short-term memory
(b) Coordination during locomotion
(c) Executive functions, such as decision making
(d) Regulation of body temperature

11. Which one of the following statements is not correct?

[AIPMT 2014]

(a) Retinal is the light absorbing portion of visual photo pigments.
(b) In retina the rods have the photopigment rhodopsin while cones have three different photopigments.
(c) Retinal is a derivative of Vitamin C.
(d) Rhodopsin is the purplish red protein present in rods only.

12. Which of the following regions of the brain is incorrectly paired with its function?

[AIPMT 2015]

(a) Medulla oblongata – Homeostatic control
(b) Cerebellum – Language comprehension
(c) Corpus callosum – Communication between the left and right cerebral cortices
(d) Cerebrum – Calculation and contemplation

13. A gymnast is able to balance his body upside down even in the total darkness because of

[AIPMT 2015]

(a) Cochlea
(b) Vestibular apparatus
(c) Tectorial membrane
(d) Organ of corti

14. In mammalian eye, the 'fovea' is the centre of the visual field, where

[RE-AIPMT 2015]

(a) The optic nerve leaves the eye
(b) Only rods are present
(c) More rods than cones are found
(d) High density of cones occur, but has no rods

15. Destruction of the anterior horn cells of the spinal cord would result in loss of [RE-AIPMT 2015]
(a) Voluntary motor impulse (b) Commissural impulses
(c) Integrating impulses (d) Sensory impulses

16. Photosensitive compound in human eye is made up of: [NEET - I, 2016]
(a) Guanosine and Retinol (b) Opsin and Retinal
(c) Opsin and Retinol (d) Transducin and Retinene

17. Choose the correct statement. [NEET - II, 2016]
(a) Meissner's corpuscles are thermoreceptors
(b) Photoreceptors in the human eye are depolarised during darkness and become hyperpolarized in response to the light stimulus
(c) Receptors do not produce graded potentials
(d) Nociceptors respond to changes in pressure

NCERT EXEMPLAR QUESTIONS

1. Chemicals which are released at the synaptic junction are called
(a) Hormones (b) Neurotransmitters
(c) Cerebrospinal fluid (d) Lymph

2. The potential difference across resting membrane is negatively charged. This is due to differential distribution of the following ions.
(a) Na^+ and K^+ ions (b) CO_3^{++} and Cl^- ions
(c) Ca^{++} and Mg^{++} ions (d) Ca^{++} and Cl^- ions

3. Resting membrane potential is maintained by
(a) Hormones (b) Neurotransmitters
(c) Ion pumps (d) None of these

4. The function of our visceral organs is controlled by
(a) Sympathetic and somatic neural system
(b) Sympathetic and parasympathetic neural system
(c) Central and somatic nervous system
(d) None of these

5. Which of the following is not involved in knee-jerk reflex?
(a) Muscle spindle (b) Motor neuron (c) Brain (d) Inter-neurons

6. An area in the brain which is associated with strong emotions is
(a) Cerebral cortex (b) Cerebellum
(c) Limbic system (d) Medulla

7. Mark the vitamin present in Rhodopsin
(a) Vitamin A (b) Vitamin B (c) Vitamin C (d) Vitamin D

8. Human eyeball consists of three layers and it encloses
(a) Lens, iris, optic nerve
(b) Lens, aqueous humour and vitreous humour

(c) Cornea, lens, iris
(d) Cornea, lens, optic nerve

9. Wax gland present in the ear canal is called
(a) Sweat gland (b) Prostate gland
(c) Cowper's gland (d) Sebaceous gland/ceruminous gland

10. The part of internal ear responsible for hearing is
(a) Cochlea (b) Semicircular canal
(c) Utriculus (d) Sacculus

11. The organ of Corti is a structure present in
(a) External ear (b) Middle ear
(c) Semicircular canal (d) Cochlea

12. While travelling to higher altitudes, people can feel pain in the ear and dizziness. Which part, among the following causes such complications?
(a) Cochlea, ear ossicles
(b) Tympanic membrane
(c) Eustachian tube, utricle, saccule and semicircular canals
(d) None of these

Answer Keys

Practice Questions

1. (c)	2. (a)	3. (a)	4. (c)	5. (c)	6. (c)	7. (a)	8. (a)	9. (a)	10. (c)
11. (c)	12. (d)	13. (b)	14. (i) (c) (ii) (a)		15. (a)	16. (c)	17. (c)	18. (b)	19. (d)
20. (b)	21. (d)	22. (b)	23. (d)	24. (d)	25. (d)	26. (a)	27. (d)	28. (d)	29. (c)
30. (a)	31. (d)	32. (d)	33. (a)	34. (d)	35. (b)	36. (d)	37. (d)	38. (b)	39. (d)
40. (c)	41. (c)	42. (c)	43. (b)	44. (d)	45. (a)	46. (d)	47. (d)	48. (c)	49. (a)
50. (a)	51. (c)	52. (c)	53. (b)	54. (c)	55. (c)	56. (b)	57. (d)	58. (c)	59. (c)
60. (d)	61. (d)	62. (d)	63. (a)	64. (c)	65. (c)	66. (b)	67. (d)	68. (d)	69. (a)
70. (c)	71. (a)	72. (a)	73. (b)	74. (b)	75. (a)	76. (d)	77. (d)	78. (b)	79. (d)
80. (d)	81. (a)	82. (b)	83. (b)	84. (c)	85. (a)	86. (d)	87. (d)	88. (b)	89. (d)
90. (b)	91. (d)	92. (a)	93. (a)	94. (b)	95. (b)	96. (b)	97. (a)	98. (c)	99. (c)
100. (c)	101. (b)	102. (d)	103. (b)	104. (d)	105. (b)	106. (a)	107. (c)	108. (d)	109. (c)
110. (d)	111. (d)	112. (c)	113. (d)	114. (c)	115. (d)	116. (d)	117. (d)	118. (d)	119. (c)
120. (a)	121. (c)	122. (a)	123. (b)	124. (d)	125. (a)	126. (b)	127. (b)	128. (b)	129. (b)
130. (d)	131. (d)	132. (d)	133. (a)	134. (a)	135. (b)	136. (b)	137. (d)	138. (a)	

Assertion and Reason Questions

139. (a)	140. (c)	141. (c)	142. (c)	143. (a)	144. (c)	145. (c)	146. (b)	147. (b)	148. (c)
149. (b)	150. (a)	151. (a)	152. (a)	153. (a)	154. (a)	155. (a)	156. (a)	157. (a)	158. (a)
159. (a)	160. (a)	161. (c)	162. (a)	163. (a)	164. (d)	165. (c)	166. (a)		

Previous Year Questions

1. (c)	2. (a)	3. (c)	4. (c)	5. (c)	6. (c)	7. (a)	8. (a)	9. (a)	10. (d)
11. (c)	12. (b)	13. (b)	14. (d)	15. (a)	16. (b)	17. (b)			

NCERT Exemplar Questions

1. (b)	2. (a)	3. (c)	4. (b)	5. (c)	6. (c)	7. (a)	8. (b)	9. (d)	10. (a)
11. (d)	12. (c)								