NEURAL CONTROL AND COORDINATION

1. Which one is correct about the physiology of eye?
   a) The pressure within the eye (the intraocular pressure) is about 1.5 mm Hg (0.2 kPa)
   b) When light is shone in one eye both pupils constrict
   c) The pupils dilate when the eye is focused on a near object
   d) The aqueous humour is an ultrafiltrate of plasma
2. Part of ear where sound is transduced is
   a) Tympanic membrane
   b) Malleus, incus and stapes
   c) Semi-circular canal
   d) Cochlea
3. You are watching a horror movie and you notice your heart is beating fast and mouth is dry. It is because of
   a) Fight and flight response
   b) Autonomic nervous system
   c) Sympathetic nervous system
   d) Both (a) and (c)
4. When the stimulus reaches the end of one neuron, it is conducted to the adjacent neuron through the secretions of
   a) Acetaldehyde
   b) Acetylcholine
   c) Acetylcholine esterase
   d) Acetyl Co-A
5. The reflex pathway comprises
   a) One afferent neuron
   b) One efferent neuron
   c) One afferent and one efferent neuron
   d) One afferent and one receptor neuron
6. The highly specialized cells called neurons can
   a) Detect stimuli
   b) Receive stimuli
   c) Transmit stimuli
   d) All of the above
7. If a motor nerve has a conduction velocity of 10 ms^{-1} , how long will it take an action potential to reach a muscle 0.75 m from the spinal cord?
   a) 75 m
   b) 1.07 m
   c) 14 m
   d) 1.4 m
8. Which of the following statements are correct about the midbrain?
   I. Located between the thalamus/hypothalamus
   II. Has a canal named cerebral aqueduct passes through
   III. Dorsal part consists of 4 lobes
   Choose the correct option
   a) I and II
   b) II and III
   c) I and III
   d) I, II and III
9. Presynaptic neuron and a post-synaptic neuron may or may not be separated by a gap called
   a) Synaptic knob
   b) Neuroreceptor gap
   c) Synapse
   d) Synaptic cleft
10. The band of fibre which joins corpora quadrigemina to cerebellum is called
    a) Pons Varolii
    b) Valve of Vieussens
    c) Corpus callosum
    d) Corpus striatum
11. What kind of neural organization can be seen in lower vertebrates?
    a) Simple neural system
    b) Complex neural system
    c) Highly developed neural system
    d) Very poor neural system
12. The movement of the nerve impulse across synaptic cleft is primarily
    a) A chemical event
    b) A physical event
    c) An electrical event
    d) A biological event

13. During the conduction of nerve impulse, the repolarization occurs with the
    a) Influx of K^+ ions
    b) Influx of Na^+ ions
    c) Efflux of K^+ ions
    d) Efflux of Mg^{2+} ions
14. How many pairs of spinal nerve are found in human?
    a) 32 b) 31 c) 30 d) 33
15. Which of the following are the properties of neural system?
    a) Conductivity and elasticity
    b) Excitability and elasticity
    c) Flexibility and excitability
    d) Excitability and conductivity
16. Which part of brain controls intellectual ability?
    a) Frontal lobe b) Parietal lobe c) Temporal lobe d) Occipital lobe
17. Which of these processes occur during repolarisation of nerve fibre?
    I. Open Na^+ channel
    II. Closed Na^+ channel
    III. Closed K^+ channel
    IV. Open K^+ channel
    a) II and IV b) I and III c) II and III d) I and II
18. The middle layer of human eye, choroid contains ...A... and looks ...B... in colour
    Choose the correct option for A, B
    a) A-blood vessels, B-bluish
    b) A-connective tissue, B-redish
    c) A-bipolar cells, B-blackish
    d) A-muscle fibre, B-brownish
19. Which pair of systems jointly coordinate and integrate all the activities of the organs, so that they function in a synchronized fashion?
    a) Neural and respiratory
    b) Neural and digestive system
    c) Neural and endocrine system
    d) Neural and circulatory system
20. Photoreceptor cells that contains the light sensitive proteins are called
    a) Rhodopigments b) Photopigments c) Conopigments d) None of these
21. The specific region of hypothalamus, responsible for physiological sweat secretion is
    a) Para-ventricular nucleus
    b) Supra-optic nucleus
    c) Median eminence
    d) Pars distalis
22. A 22 years student goes to his ophthalamologist. He has problem in reading books because he is not be able to contract his
    a) Suspensory ligament
    b) Pupil
    c) Iris
    d) Ciliary muscles
23. The accumulation of protein called amyloid β – peptide in human brain causes
    a) Addison's disease
    b) Huntington's disease
    c) Alzheimer's disease
    d) Motor-neuron disease
24. A structure of neuron comprises of
    a) Cell body, synaptic knob, ganglia
    b) Synaptic vesicles, ganglia, dendrites
    c) Cell body, dendrites, ganglia
    d) Cell body, dendrites, axon
25. The process of response to a peripheral nervous stimulation, that occurs involuntarily is called
    a) Reflactory potential b) Action potential c) Reflex action d) Activation potential
26. The adult human eyeball is nearly a ..... structure
    a) Oval b) Circular c) Opaque d) Spherical
27. The sympathetic and parasympathetic neural system combines to form
    a) Somatic neural system
    b) Autonomic neural system
    c) Central neural system
    d) Peripheral neural system
28. Choose the correct non-protein amino acid from the given option.
    a) Hydroxyproline
    b) Hydroxylysine

c) Cystine d) γ-amino butyric acid

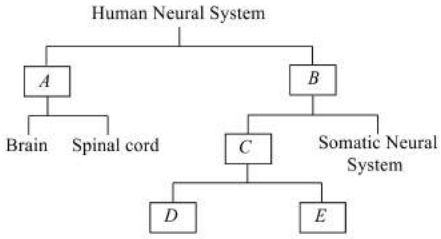
29. In a man, abducens nerve is injured. Which one of the following function will be affected?
a) Movement of the eye ball b) Swallowing
c) Movement of the tongue d) Movement of the neck

30. Which of the following parts of a neuron is covered by fatty sheath?
a) Axon b) Cyton c) Dendrite d) Node of Ranvier

31. The system that transmits impulses from CNS to skeletal muscles is
a) Sympathetic neural system b) Parasympathetic neural system
c) Somatic neural system d) Autonomic neural system

32. The pressure on either sides of the ear drum gets equalized by
a) Pinna b) Eustachian tube c) Cochlea d) Labyrinth

33. The diagram given below is the functional organization of the human nervous system. identify A, B, C, D and E in the figure



a) A-PNS, B-CNS, C-ANS, D-Sympathetic nervous system, E-Parasympathetic nervous system
b) A-ANS, B-CNS, C-PNS, D-Sympathetic nervous system, E-Parasympathetic nervous system
c) A-CNS, B-PNS, C-ANS, D-Sympathetic nervous system, E-Parasympathetic nervous system
d) A-ANS, B-PNS, C-ANS, D-Sympathetic nervous system, E-Parasympathetic nervous system

34. In the resting state of the neural membrane, diffusion due to concentration gradients, if allowed would drive
a) K^+ into the cell b) $K^+$and Na^+ out of the cell
c) Na^+ into the cell d) Na^+ out of the cell

35. Which is a part of spinal cord?
a) Central canal b) Ventricle c) Ventral canal d) Enterocoel

36. Mark the following statements as true/false and choose the correct option from the codes given below
I. Neuroglial cells are the packing and supporting cells found in the brain and spinal cord
II. Oligodendrocytes is a category of glial cells that forms myelin sheaths around the axon
III. Microglia provides mechanical support to the neurons
IV. Astrocytes communicate with one another through potassium channels

Codes

	I	II	III	IV
a)	True	True	False	False
b)	False	True	True	False
c)	False	False	True	True
d)	True	False	True	False

37. For quick coordination, our neural system is organized through
a) Organ to organ connections b) Cell to cell connections
c) Point to point connections d) Point to cell connections

38. Saltatory conduction occurs in
a) Myelinated nerves fibres b) Non-myelinated nerve fibres
c) Liver cells d) All of the above

39. Action of lysozyme is
a) Physiological b) Anatomical c) Morphological d) None of these

40. The process through which two or more organs interact and complement the functions of one another, is called

a) Coordination
b) Homeostasis
c) Chemical integration
d) Transmission of impulse

41. Skeletal muscles are controlled by
a) Sympathetic nerves
b) Parasympathetic nerves
c) Somatic nerves
d) Autonomic nerves

42. Yellow spot of eye is known for
a) Complex blood vascular system
b) High pigmentation
c) Preponderance of cones
d) Possession of abdundant rods

43. Middle ear of humans contains ossicles, *i. e.*,
a) Malleus
b) Incus
c) Stapes
d) All of these

44. Mechanism of neural coordination involves
a) Transmission of nerve impulse
b) Impulse conduction across a synapse
c) Physiology of reflex action
d) All of the above

45. Which converts short time memory into long time remembrance?
a) Reticular system
b) Hippocampus
c) Thalamus
d) Medulla oblongata

46. During the transmission of nerve impulse through a nerve fibre, the potential on the inner side of the plasma membrane has which type of electric charge?
a) First negative, then positive and again back to negative
b) First positive, then negative and continue to be negative
c) First negative, then positive and continue to be positive
d) First positive, then negative and again back to positive

47. Read the following statements.
I.Preganglionic nerve fibres of III, VII, IX and X cranial nerves are a part of the parasympathetic nervous system
II.V,VII, IX and X cranial nerves are mixed nerves.
III.Trochlear nerves are the largest cranial nerves.
IV.Abducens nerves are motor nerves and originate from the Gasserian ganglia.
Which of the above statements are correct?
a) I and IV
b) I and II
c) II and III
d) I and III

48. There are two types of photoreceptor cells, *i. e.*, ...A... and ...B... . These cells contains photopigments Here, A and B refers to
a) A-rods; B-cones
b) A-cones; B-rhodopsin
c) A-rhodopsin; B-rods
d) A-rods; B-fovea

49. Which is not a reflex action?
a) Salivation
b) Eye opening and closing
c) Response to pinching pin in a frog leg
d) Sweating

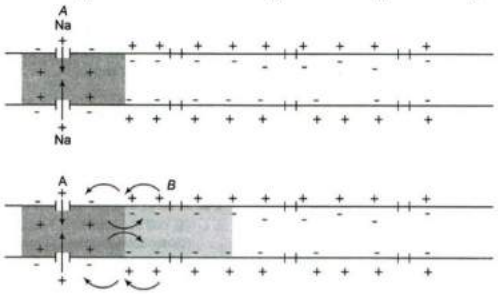
50. A nerve impulse is transmitted from one neuron to another through the junctions called
a) Neuromuscular junction
b) Neuroreceptor junction
c) Neurosynaptic junction
d) Neuroglandular junction

51. The afferent nerve fibres transmit impulses
a) From tissues/organs to the CNS
b) From the CNS to the smooth muscles
c) From the CNS to the concerned peripheral tissues/organs
d) From the CNS to the involuntary organs

52. Which of the damaged cells cannot be repaired?
a) Liver cells
b) Brain cells
c) Bone cells
d) Epidermal cells

53. The system that transmits impulse from the CNS to the involuntary organs and smooth muscles of the body
a) Sympathetic neural system
b) Parasympathetic neural system
c) Somatic neural system
d) Autonomic neural system

54. Given is the diagrammatic representation of impulse conduction through an axon (at points A and B). View the diagram and arrange the steps of impulse conduction



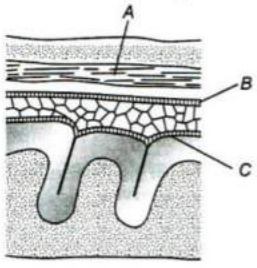
I. The polarity of the membrane at site A is reversed and depolarized, *i. e.*, the outer surface becomes negatively charged and the innerside becomes positively charged, generating nerve impulse
II. A stimulus causes disturbance to the membrane at site of A nerve fibre resulting in leakage of Na^+ ions inside the nerve fibre
III. On the outer surface, current flows from site B to site A to complete the circuit of current flow. Hence, the polarity at the site is reversed, and an action potential is generated at site B. The impulse (action potential) generated at site A arrives at site B. The sequence is repeated along the length of the axon and consequently the impulse is conducted
IV. Immediately ahead, the axon (*e. g.*, site B) membrane has a positive charge on the outer surface and a negative charge on its inner surface. As a result, a current flows on the inner surface from site A to site B
The correct option is
a) I → II → IV → III
b) II → I → III → IV
c) II → I → IV → III
d) I → IV → III → II

55. Identify the basic functions of neural system
a) Receiving sensory input from internal and external environment by nerves
b) Processing the input information
c) Responding to stimuli
d) All of the above

56. How many laminae are present in the grey matter of spinal cord?
a) Four
b) Six
c) Eight
d) Ten

57. Number of cranial nerves in frog
a) 10 pairs
b) 9 pairs
c) 12 pairs
d) None of these

58. Given is the diagram of human brain showing meninges. Identify *A* and *C*



a) A-Piamater, B-Arachnoid membrane, C-Duramater
b) A-Duramater, B-Arachnoid membrane, C-Piamater
c) A-Arachnoid membrane, B-Piamater, C-Duramater
d) A-Arachnoid membrane, B-Duramater, C-Piamater

59. Reflex action is controlled by
a) Sympathetic nervous system
b) Autonomous nervous system
c) Spinal cord
d) Peripheral nervous system

60. Vitreous chamber, which is filled by vitreous humor is the space

a) Behind the lens
b) In front of lens
c) between choroid and retina
d) between choroid and sclera

61. Organ of Corti is found in
a) Heart
b) Kidneys
c) Inner ear
d) Nasal chamber

62. During repolarisation of nerve
a) K^+ gate close and Na^+gate opens
b) Na^+channels are close and K^+ channels are opens
c) Both gates remain open
d) Both $K^+$and Na^+ gates are close

63. Choose the incorrect options regarding white matter of the brain
I. White matter of the brain is white in colour
II. White matter of the brain is white in colour but sometimes it is found to be grey
III. White matter of the brain is mostly formed by medullated nerve fibres
IV. White matter of the brain is formed of cell bodies of nerve fibres
a) I and III
b) II and IV
c) I and IV
d) II and III

64. Which of the following neuron is also called excitor neuron?
a) Afferent neuron
b) Efferent neuron
c) Interneuron
d) Both (b) and (c)

65. Brain and spinal cord, combinely form the
a) CNS
b) PNS
c) Both (a) and (b)
d) Neural system

66. Nerve cells are the part of
a) Epithelial tissue
b) Connective tissue
c) Muscles tissue
d) Nervous tissue

67. Spinal cord is protected by
a) Trachea
b) Aorta
c) Sternum
d) Vertebral column

68. A person is wearing spectacles with concave lenses for correcting vision. While not using the glasses, the image of a distant object in his case will be formed?
a) On the blind spot
b) Behind the retina
c) In front of retina
d) On the yellow spot

69. On the basis of nature of nerve fibres, the nerves are
a) Medullated and non-medullated nerves
b) Myelinated and non-myelinated nerves
c) Sensory, motor and mixed nerves
d) Sensory and motor nerves

70. Which of the following system provides the fastest means of communication within the body?
a) Endocrine system
b) Nervous system
c) Circulatory system
d) Digestive system

71. The correct sequence of meetings of brain from outside to inside is
a) duramater → arachnoid → piamater
b) arachnoid → duramater → piamater
c) piamater → duramater → arachnoid
d) duramater → piamater → arachnoid

72. Which of the following features show antagonism over a particular organ?

	Organs	**Sympathetic Nervous System**	**Parasym pathetic Nervous System**
a)	Gastric glands	Stimulates secretion of gastric juice	Reduces bile secretion, increases release of sugar
b)	Intestinal glands	Decreases secretion of intestinal juice	Promotes secretion of intestinal juice

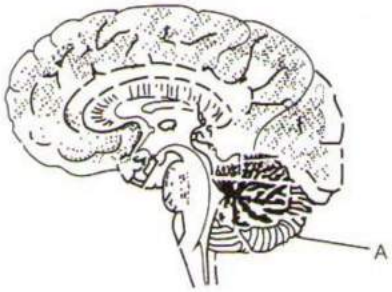
c)

Pancreas	Promotes bile secretion	Increases storage of sugar as glycogen

d)

Salivary glands	Stimulates secretion of saliva	Inhibits secretion of saliva

73. The cutaneous plexus and the papillary plexus consists
    a) A network of nerves to provide dermal sensation
    b) A network of arteries to provide dermal supply
    c) Specialized cells for cutaneous sensations
    d) Gland cells that release cutaneous secretions
74. The velocity of action potential propagation
    a) Is independent of an axon's diameter
    b) Depends on the thickness of the myelin around the axon
    c) Will be unaffected if the axon becomes demyelinated
    d) Is fastest in non-myelinated axons
75. Anterior choroid plexus is present on the
    a) Floor of diencephalon
    b) Cerebral hemispheres
    c) Roof of diencephalon
    d) Roof of medulla oblongata
76. Retina of eye is analogous to which part of camera?
    a) Shutter b) Lens c) Glass d) Film
77. In the given diagram, what does 'A' represents?



    a) Pons Varolii b) Cerebellum c) Medulla oblongata d) Midbrain
78. ..... is not involved in knee-jerk reflex
    a) Muscle spindle b) Motor neuron c) Brain d) Interneurons
79. $Na^+ - K^+$ pump is found in membranes of many cells, like nerve cells. It works against electrochemical gradient and involve of ATP used
    a) 3 ions of Na^+ are pumped out and $2K^+$ are taken in
    b) 3 ions of Na^+ are taken in and $2K^+$ are pumped out
    c) 2 ions of Na^+ are thrown out and $3K^+$ are absorbed
    d) 3 ions of K^+ are absorbed, $3Na^+$ are pumped out
80. Synaptic knob is bulb-like structure which is present
    a) At the end of axon terminal
    b) At the node of Ranvier
    c) In the cell body
    d) At the end of dendrites
81. Autonomic nervous system affects
    a) Reflex actions b) Sensory organs c) Internal organs d) None of these
82. The function of Na^+ and K^+ pump is to move
    a) Na^+ in and K^+ out b) Na^+ out and K^+ in c) Na^+ out and Cl^- in d) Cl^- out and Na^+ in
83. The PNS comprises of

a) Brain
b) Spinal cord
c) Both (a) and (b)
d) All the nerves of the body associated with the CNS

84. Read the following statements carefully and select the correct option
I. The medulla is connected to the spinal cord
II. Medulla contains controlling centres for respiration, cardiovascular reflexes and gastric secretion
III. Cerebellum has very convoluted surface in order to provide the additional space for more neurons
a) Only I
b) I and II
c) Only III
d) I, II and III

85. The respiratory rhythm centre is present in the
a) Cerebrum
b) Cerebellum
c) Hypothalamus
d) Medulla oblongata

86. Which of the following is the correct function of endocrine system with reference to chemical coordination?
a) Provides neural integration through hormones
b) Provides chemical integration through hormones
c) Provides an organized network of point to point connections for a quick coordination
d) None of the above

87. Consider the statements as True/False
I. The axoplasm inside the axon contains high concentration of K^+ and negatively charged proteins
II. The axoplam inside the axon contains low concentration of Na^+
III. The fluid outside the axon contains a low concentration of K^+
IV. The fluid outside the axon contains a high concentration of Na^+ and negatively charged proteins
The correct option is
a) I-True, II-False, III-False, IV-True
b) I-True, II- True, III-False, IV- False
c) I-True, II- True, III- True, IV- False
d) I- False, II- True, III-False, IV- False

88. Maintenance of the ionic gradients across the resting membrane is done by the
a) Active transport of ions
b) Passive transport of ions
c) Active transport of proteins
d) Passive transport of proteins

89. How many pairs of cranial nerves are found in humans?
a) 10 pairs
b) 11 pairs
c) 12 pairs
d) 13 pairs

90. Which part of the brain is involved in loss of control when a person drinks alcohol?
a) Cerebellum
b) Cerebrum
c) Medulla oblongata
d) Pons Varolii

91. Ependymal cells
a) Ciliated cells
b) Type of epithelial cells
c) Lines the cavities of the central nervous system
d) All of the above

92. In the blind spot, where the optic nerves leave the eyes
a) Rods and cones are absent
b) Only cones are present
c) Only rods are present
d) Special neurons are present

93. Association areas of the brain are
a) Always sensory areas
b) Always motor areas
c) Neither sensory nor motor areas
d) None of the above

94. Study of structure, functions and disease of the nervous system is called
a) Nervology
b) Endocrinology
c) Neurology
d) Endoneurology

95. Which of the following statements are correct for RAS?
I. It screens sensory information
II. It is important in overall activation and arousal
III. It is concerned with involuntary movements
IV. It is the seat of learning, memory, reasoning and creative ability
a) I and II
b) II and III
c) II and IV
d) I and IV

96. Which is not a part of hindbrain?

a) Thalamus b) Cerebellum c) Pons Varolii d) Medulla

97. Which of the following statements are correct for iris?
I. The ciliary body extends forward to form iris
II. It is pigmented and opaque structure
III. It is the visible coloured portion of the eye
Choose the correct option
a) I and II b) I and III c) II and III d) I, II and III

98. Brain depends on blood for the supply of
a) Oxygen and glucose b) Oxygen and electrolytes
c) Oxygen and ATP d) ATP and glucose

99. In the axon of motor nerve fibre, the nerve impulse travels
a) Towards cell body b) Away from cell body
c) Away from synapse d) In both directions

100. Rods and cones are present in
a) Iris b) Cornea c) Sclerotic d) Retina

101. Synaptic vesicle is found in
a) Pre-synaptic neuron b) Post-synaptic neuron
c) Synaptic cleft d) None of these

102. Which one of the following is an example of negative feedback loop in humans?
a) Constriction of skin blood vessels and contraction of skeletal muscles when it is too cold
b) Secretion of tears after falling of sand particles into the eyes
c) Salivation of mouth at the sight of delicious food
d) Secretion of sweat glands and constriction of skin blood vessels when it is too hot

103. The brain can be divided into
a) Telencephalon, Rhombencephalon, Diencenphalon
b) Mesencephalon, Telencephalon, Diencenphalon
c) Prosencephalon, Mesencephalon, Rhombencephalon
d) Diencenphalon, Prosencephalon, Rhombencephalon

104. Under prolonged starvation, brain receives energy from
a) Carbohydrates b) Fats c) Proteins d) Acetoacetate

105. Coiled portion of the labyrinth is called
a) Cochlea b) Ear drum c) Pinna d) Ear canal

106. Pneumotaxic centre is present in
a) Cerebrum b) Cerebellum c) Medulla oblongata d) Pons Varolii

107. Sympathetic nervous system induces
a) Heat beat b) Secretion of semen
c) Secretion of saliva d) Secretion of digestive juices

108. Which of the following is correct in case of chemical synapses?
I. The membranes of the pre and postsynaptic neurons are separated by a gap called synaptic cleft
II. Chemicals called neurotransmitters are involved in the transmission of impulses
III. Impulse transmission in chemical synapse is faster than that across an electrical synapse
IV. Chemical synapses are rare in our system
a) I, II and IV b) II and III c) I and II d) I, II, III and IV

109. What used to be described as Nissl's granules in a nerve cell are now identified as?
a) Ribosomes b) Mitochondria c) Cell metabolities d) Fat granules

110. Which of the following is known as the site of information processing and control?
a) CNS b) PNS c) Both (a) and (b) d) Neurons

111. Injury to vagus nerve in human is not likely to affect
a) Tongue movements
b) Gastrointestinal movements
c) Pancreatic secretion
d) Cardiac movements

112. The human neural system comprises
a) PNS only
b) CNS only
c) Both (a) and (b)
d) None of these

113. Association areas are regions found in
a) Cerebrum
b) Cerebral cortex
c) Cerebellum
d) Diencephalon

114. A neuron is a ..... structure
a) Microscopic
b) Symmetrical
c) Non-microscopic
d) Glant

115. Photoreceptor cells of human eye are
a) Rods
b) Cones
c) Both (a) and (b)
d) Ganglion cells

116. Parkinsonism is related with
a) Brain
b) Spinal cord
c) Cranial nerves
d) Spinal nerves

117. Protein found in eye lens is
a) Crystalline
b) Collagen
c) Opsin
d) Rhodopsin

118. One of the examples of the action of the autonomous nervous system is
a) Knee-jerk response
b) Papillary reflex
c) Swallowing of food
d) Peristalsis of the intestines

119. The nervous tissue forms the nervous system in animals. Which of the following is correct about its origin?
a) Merodermal
b) Ectodermal
c) Endodermal
d) None of these

120. Which part of the human brain is largest?
a) Cerebellum
b) Thalamus
c) Cerebrum
d) Medulla oblongata

121. A transparent crystalline structure which is held in place by ligaments attached to the ciliary body, is called the
a) Ciliary body
b) Lens
c) Iris
d) Pupil

122. The most appropriate definition for neuroglial cells are that they are
a) Non-sensory supporting cells
b) Secretory cells
c) Sensory cells
d) Sensory and supporting cells

123. Brain controls the
a) Voluntary movements
b) Balance of the body
c) Functioning of vital involuntary organs
d) All of the above

124. Myelin sheath is derived from
a) Neuroglial cells
b) Schwann cells
c) Nerve cells
d) All of these

125. The forebrain consists of
a) Cerebrum
b) Thalamus
c) Hypothalamus
d) All of these

126. In humans, pneumotaxic centre is present in
a) Thalamus
b) Pons region of brain
c) Right hemisphere
d) Left hemisphere

127. Hypothalamus controls
I. urge for eating and drinking
II. thermoregulation
III. hormones production that regulates the secretion of pituitary gland
IV. creative thinking and consciousness
a) I and III are correct
b) II and III are correct
c) I and II are correct
d) I, II and III are correct

128. Which centre is stimulated during increase in body temperature?
a) Anterior hypothalamus
b) Posterior hypothalamus
c) Limbic system
d) Red nucleus

129. Give movements are controlled by
I. Gastrointestinal movement

II. Pancreatic movement
III. Tongue movement
Select the correct option
a) I and II are controlled by vagus nerve
b) I and III are controlled by vagus nerve
c) Only I is controlled by vagus nerve
d) Only II is controlled by vagus nerve

130. Which one is correct regarding the ear and hearing?
a) The range of human hearing is from 20 Hz to 20 kHz
b) Conductive hearing loss would be evident if a person had a similar degree of hearing loss for air conduction and bone conduction
c) The ear is most sensitive to frequencies between about 100 Hz and 300 Hz
d) The endolymph of the scala media is similar in composition to plasma

131. Given below the hormones present in human body
I. Cortisone
II. Acetylcholine
III. Epinephrine
Choose the correct option regarding these hormones
a) I and II are neurotransmitter
b) I and III are neurotransmitter
c) II and III are neurotransmitter
d) All are neurotransmitter

132. In dark adaptation,
a) Only cones are involved
b) Only rods are involved
c) Both (a) and (b)
d) Neither rods nor cones are involved

133. Dreaming occurs in
a) α-sleep
b) REM sleep
c) Deep sleep
d) Slow wave sleep

134. Node of Ranvier is found in
a) Muscle bundles
b) Dendrite
c) Right auricle
d) Axon

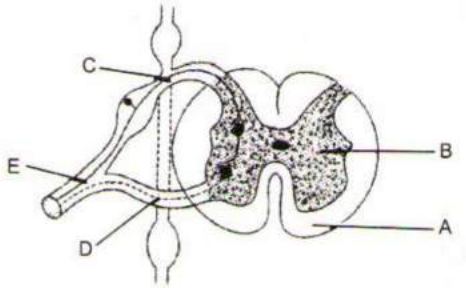
135. Aqueous and vitreous humour are divided by
a) Lens
b) Iris
c) Retina
d) Optic nerve

136. Cerebellum is concerned with the
a) Contraction of voluntary muscles
b) Coordinating and regulation muscles tone
c) Maintaining posture orientation and equilibrium of body
d) All of the above

137. Unidirectional transmission of a nerve impulse through nerve fibre is due to the fact that
a) Nerve fibre is insulated by a medullary sheath
b) Sodium pump starts operating only at the cyton and then continues into the nerve fibre
c) Neurotransmitters are released by dendrites and not by axon endings
d) Neurotransmitters are released by the axon endings and not by dendrites

138. The TV cranial nerve is
a) Oculomotor
b) Trochlear
c) Olfactory
d) Facial

139. In a cross-section of the spinal cord A, B, C, D and E represents



a) A-White matter, B-Grey matter, C-Dorsal matter, D-Ventral root, E-Spinal nerve
b) A-White matter, B-Grey matter, C-Ventral root, D-Dorsal root, E-Spinal nerve
c) A-Grey matter, B-White matter, C-Ventral matter, D-Dorsal root, E-Spinal matter
d) A-Grey matter, B-White matter, C-Dorsal root, D-Ventral root, E-Spinal nerve

140. By which nervous system and of what type, the blood is supplied into visceral organs?
a) Sympathetic nervous system, voluntary
b) Sympathetic nervous system, involuntary
c) Parasympathetic nervous system, involuntary
d) Both SNS and PNS, involuntary

141. Light falls on retina and its amount is regulated by
a) Iris b) Ciliary muscles c) Cornea d) Lens

142. Blind spot is called to because of
a) The presence of photoreceptor cells b) Presence of optic nerves
c) The absence of photoreceptor cells d) None of the above

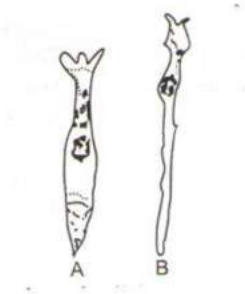
143. If dorsal nerve of spinal cord is broken down then
a) No impulse is transmitted b) Impulse is transmitted but slowly
c) Impulse is transmitted fast d) No effect on impulse

144. Arrange the given structures in the correct sequence of pathway of light from outside to inside the eyeball of human eye
I. Lens
II. Aqueous humour
III. Vitreous humour
IV. Cornea
Choose the correct sequence
a) IV, II, I, III b) I, II, III, IV c) IV, III, II, I d) I, IV, II, III

145. Which of the following is not correct for rods?
I. Twilight vision is the function of the rods
II. It is responsible for daylight vision sometimes
III. The rods contain a protein called rhodopsin
IV. Rods are photoreceptor cells
Choose the correct option
a) Only I b) Only II c) I and III d) II and III

146. Three major components of human eyeball are
a) Lens, aqueous humor and vitreous humor b) Lens, iris and optic nerve
c) Cornea, lens and optic nerve d) Cornea, lens and iris

147. Examine the diagram of the two cell types A and B given below and select the correct option.



a) Cell-A is the rod cell found evenly all over retina
b) Cell-A is the cone cell more concentrated in the fovea centralis
c) Cell-B is concerned with colour vision in bright light
d) Cell-A is sensitive to low light intensities

148. Which of the following is not correctly matched?
a) Rhinencephalon-Olfactory
b) Hypothalamus-Pituitary
c) Cerebellum-Balance
d) Medulla oblongata-Temperature regulation

149. When we do physical exercises, the energy demand is increased for
a) Increasing the chemical coordination
b) Providing the chemical integration
c) Integrating all the activities of the organs
d) Maintaining an increased muscular activity

150. Choose the correct statements about Nissl's granules from the codes given below
I. There are regular masses of ribosomes
II. There are irregular masses of ribosomes and ER
III. There are granular bodies
IV. They synthesise proteins in the cell
codes
a) Only I
b) I and III
c) I and IV
d) II, III and IV

151. Olfactory lobes of man are
a) Fused and hollow
b) Fused and solid
c) Free and hollow
d) Solid

152. Ampulla of Lorenzini are thermoreceptors which are found in
a) Fishes
b) Man
c) Reptiles
d) Bats

153. Vertebrate brain differentiates from
a) Endoderm
b) Mesoderm
c) Ectoderm
d) Blastoderm

154. The choroid layer of human eye is
a) Thin over the posterior 2/3 of eyeball
b) Thick over the posterior 4/3 of eyeball
c) Coloured over the anterior 2/3 of eyeball
d) Opaque structure over the anterior 4/3 of eyeball

155. Which of the following is correct for pupil of human eye?
I. It is the aperture surrounded by the iris
II. The diameter of pupil is regulated by muscle fibres of iris
III. It is a transparent crystalline structure attached to the ciliary body
The correct option is
a) Only I
b) Only III
c) I and II
d) I, II and III

156. Which cranial nerve gives out a number of branches?
a) Optic
b) Facial
c) Vagus
d) Trigeminal

157. The ...A... receives signal from a sensory organ and transmits the impulse *via* a dorsal nerve root into the CNS (at the level of spinal cord) while the ...B... carries signals from ...C... to the ...D...
Choose the correct option for *A*, *B*, *C* and *D* to complete the given statement
a) A-efferent neuron, B-afferent neuron, C-CNS, D-effector
b) A-afferent neuron, B-efferent neuron, C-effector, D-CNS

c) A-afferent neuron, B-efferent neuron, C-CNS, D-effector
d) A-efferent neuron, B-afferent neuron, C-effector, D-CNS

158. Which one of the following cranial nerves is carrying the nerve fibres originating from the Edinger-Westphal nucleus?
a) Oculomotor b) Trochlear c) Abducens d) Vagus

159. When we do physical exercises, the energy demand is
a) Increased b) Decreased c) Not effected d) Both (a) and (b)

160. Which part of human brain is concerned with the regulation of body temperature?
a) Medulla oblongata b) Cerebellum c) Cerebrum d) Hypothalamus

161. Identify the correct sequence of organs/regions in the organisation of human ear as an auditory mechanoreceptor organ.
a) Pinna—Cochlea—Tympanic membrane canal—Malleus—Stapes—Incus—Auditory nerve
b) Pinna—Tympanic membrane— Auditory canal—Incus —Malleus— Stapes—Cochlea—Auditory nerve
c) Pinna—Malleus—Incus—stapes—Auditory canal—Tympanic membrane—Cochlea—Auditory nerve
d) Pinna—Tympanic membrane—Auditory canal—Cochlea—Malleus—Incus—Stapes-Auditory nerve

162. Thalamus is a structure wrapped by cerebrum, is
a) A major centre for motor signaling
b) A major coordinating centre for sensory and motor signaling
c) A major coordinating centre for sensory signal only
d) Not a nervous part of a brain

163. When different cones of human eye are stimulated equally, a sensation of ..... light is produced
a) Red b) White c) Green d) Blue

164. Ultra violet radiation from sun causes which of the following disorder of eyes?
a) Cataract
b) Glaucoma
c) Dilation of pupil
d) Some defect of retina

165. Which of the following statements are correct about the cortex of cerebum? Choose the correct codes given below
I. It consists of grey matter
II. It shows prominent folds
III. It consists of white matter
IV. It contains motor areas, sensory areas and association areas
Codes
a) Only I b) I and II c) I, II and IV d) I, III and IV

166. The vestibular apparatus of human ear is composed of
a) Oval window
b) Otolith organs
c) Three semicircular canals
d) Both (b) and (c)

167. Which one of the following is the correct difference between rod cells and cone cells of retina?

a)

Feature	Rod cell	Cone cell
Visual acuity	High	Low

b)

Visual pigment contained	Iodopsin	Rhodopsin

c)

Overall function	Vision in poor light	Colour vision and

d)

Distribution	More concentrated in	Evenly distributed all

		detailed vision in bright light

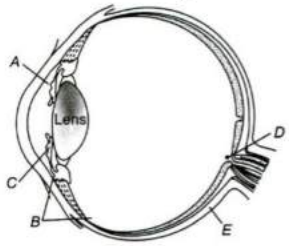
	centre of retina	over retina

168. Human tears contains an enzyme
a) Lysozyme b) Rennin c) Protease d) Peptidase

169. Which of the following statements are correct for a nerve cell?
I. Each neuron has a cell body
II. Each neuron has a single axon
III. Each neuron has a variable number of dendrites
IV. Neurons are the functional units of nervous system
Select the correct option
a) I and IV b) I, II and III c) All are incorrect d) All are correct

170. Structurally what are olfactory nerve cells?
a) Multipolar neurons b) Unipolar neurons
c) Neurochemically specialized neurons d) Bipolar neurons

171. Given is the diagram of human eye. Identify *A* and *E*



a) Aqueous chamber → Ciliary body → Iris → Blindspot → Sclera
b) Aqueous chamber → Ciliary body → Sclera → Blindspot → Iris
c) Aqueous chamber → Ciliary body → Blindspot → Iris → Sclera
d) Ciliary body → Aqueous chamber → Blindspot → Iris → Sclera

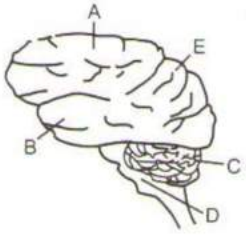
172. Which of the following is cochlear duct?
a) Scala vestibule b) Scala tympani c) Scala media d) None of these

173. Pneumotaxic centre is present in the
a) Pons varoli b) Cerebellum
c) Corpora quadrigemina d) Corpus stratum

174. Which of the following is the part of midbrain of rabbit?
a) Diencephalon b) Cerebrum
c) Corpora quadrigemina d) None of these

175. Arbor vitae is composed of
a) Grey matter b) Neurogleal cells c) White matter d) All of these

176. In the diagram of the lateral view of the human brain, parts are indicated by alphabets. Choose the answer in which these alphabets have been correctly matched with the part 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-Parietal lobe

177. Medulla oblongata is originated from
a) Ectoderm b) Mesoderm c) Endoderm d) Ectomesoderm

178. The forebrain develops into
a) Diencephalon and pons
b) Diencephalon and medulla
c) Diencephalon and cerebrum
d) Diencephalon and cerebellum

179. Which of the following statement is correct for Iter?
a) It form a branching tree like core of white matter, called arbor vital
b) It is a very narrow cavity, the cerebral aqueduct, extends through the forebrain
c) It is a very narrow cavity, the cerebral aqueduct, extends through the midbrain
d) It connects the pons varolii and cerebellum

180. 'Adaptation' of eyes in dark is due to
a) Depletion of vision pigment in rod
b) Depletion of vision pigment in cones
c) Repletion of vision pigment in rods
d) Repletion of vision pigment in cones

181. Which of the following statements is correct regarding receptors in the skin?
a) All skin receptors are encapsulated
b) The receptive fields of touch receptors are uniform in area
c) The nociceptors of the skin are bare nerve endings
d) All sensory information from the skin reaches the brain *via* the dorsal column pathway

182. Nerve impulse travels faster in
a) Medullated nerve fibre
b) Non- medullated nerve fibre
c) Both (a) and (b)
d) None of the above

183. If an organism has more rods, it will
a) Active during day
b) Possess colour vision
c) Active during night
d) Both (a) and (a) are possible

184. The cell body of neuron contains of
a) Cytoplasm b) Cell organelles c) Granular bodies d) All of these

185. Connection between axon and dendrite is
a) Synapse b) Synapsis c) Desmosome d) Tight junction

186. On postsynaptic membrane, the new potential developed is
a) Always inhibitory
b) Always excitatory
c) May be excitatory or inhibitory
d) Neither excitatory nor inhibitory

187. The cranial nerve that goes to the external rectus muscle is
a) II b) III c) VII d) VI

188. Number of spinal nerves in rabbit is
a) 27 pairs b) 31 pairs c) 37 pairs d) 47 pairs

189. The supporting and nutritive cells found in the brain are

a) Ependymal cells b) Microglia c) Astrocytes d) Oligodendrocytes

190. Which of the following substances leads to the inhibition of central nervous system?
a) Glycine b) GABA c) Norepinephrine d) Both (a) and (b)

191. Which part of human ear is concerned with hearing?
a) Reissner's membrane and basilar membrane
b) Reissner's membrane and tectorial membrane
c) Ampulla
d) Basilar membrane and tectorial membrane

192. Fovea in the eye is a central pit in the yellowish pigmented spot called
a) Blind spot b) Retina c) Cornea d) Macula lutea

193. Which foramen is paired in mammalian brain?
a) Foramen of Luschka b) Foramen of Magendie
c) Foramen of Monro d) Inter-ventricular foramen

194. Dendrites transmit impulses towards the
a) Cell body b) Axon c) Both (a) and (b) d) None of these

195. Centre for thinking and learning is present in which part of brain?
a) Cerebrum b) Cerebellum c) Dienceohalon d) Medulla oblongata

196. The reflex arc, which is made of two neurons is known as
a) Monosynaptic reflex arc b) Disynaptic reflex arc
c) Polysynaptic reflex arc d) Asynaptic reflex arc

197. Bipolar neurons are found in the
a) Embryonic stage b) Cerebral cortex c) Cerebellum d) Retina of eye

198. During the conduction of a nerve impulse, the action potential results from the movement of
a) K^+ions from extracellular fluid to intracellular fluid
b) Na^+ ions from intracellular fluid to extracellular fluid
c) K^+ ions from intracellular fluid to extracellular fluid
d) Na^+ ions from extracellular fluid to intracellular fluid

199. Bipolar neurons occur in
a) Vertebrate embryos b) Retina of eye
c) Brain and spinal cord d) Skeletal muscles

200. Which one of the following statements is correct?
a) Neurons regulate endocrine activity, but not *vice versa*
b) Endocrine glands regulate neural activity and nervous system regulates endocrine glands
c) Neither hormones control neural activity nor the neurons control endocrine activity
d) Endocrine glands regulate neural activity but not *vice versa*

201. 9^{th} pair of cranial nerve in frog is
a) Hypoglossal b) Glossopharyngeal c) Vagus d) Trigeminal

202. Cerebellum of brain is responsible for
a) The maintenance of equilibrium and posture
b) Olfactory functions
c) Controlling optic functions
d) All of the above

203. The point in eye of mammals from which optic nerves and blood vessels leave the eye ball is
a) Yellow spot b) Blind spot c) Pars optica d) None of these

204. Cornea transplant in humans is almost never rejected. This is because
a) Its cells are least penetrable by bacteria b) It has no blood supply

c) It is composed of enucleated cells
d) It is a non-living layer

205. In the following abnormalities of the eye, which one is serious condition that leads to blindness?
a) Presbyopia b) Myopia c) Hypermetropia d) Glaucoma

206. Synaptic knob possesses
a) Granular vesicles b) Nissl's vesicles c) Synaptic vesicles d) None of these

207. Which of the following poet is involved in interpreting an input, storing input information and initiating a response in the light of similar past experiences?
a) Motor area b) Sensory area c) Association area d) Pons Varolii

208. Which of the following is not related to the autonomic nervous system?
a) Peristalsis
b) Digestion
c) Excretion
d) Memory and learning

209. The wall of the eyeball is composed of ..... layers
a) One b) Two c) Three d) Four

210. The total amount of cerebrospinal fluid in humans is
a) 1 L b) 2 L c) 80-150 mL d) 400-500 mL

211. Give the correct term for each of the following and choose the correct option from the codes given below
A. Axon or dendron, covered with one or two sheaths
B. Bundles of nerve fibres within the centralnervous system
C. Masses of neurons that lie in the peripheral nervous system
D. Masses of neurons clustered inside the central nervous system
Codes
a) A-Nerve fibre, B-Tracts, C-Ganglia, D-Nuclei
b) A-Tracts, B-Nerve fibre, C-Ganglia, D-Nuclei
c) A-Ganglia, B-Nuclei, C-Tracts, D-Nerve fibre
d) A-Ganglia, B-Tracts, C-Nerve fibre, D-Nuclei

212. The amount of CSF in the cranial cavity is
a) 500 mL b) 140 mL c) 1 L d) 1.5 mL

213. Inside the skull, the brain is covered by
a) Arachnoid b) Cranial meninges c) Piamater d) Duramater

214. The rods contains a purplish-red protein called
a) Opsin b) Rhodopsin c) Photopsin d) Iodopsin

215. Which of the following prevents internal reflection of light within the eye?
a) Cornea b) Choroid c) Sclera d) Conjunctiva

216. Parkinson's disease (characterized by tremors and progressive rigidity of limbs) is caused by degeneration of brain neurons that are involved in movement and control. Identify the neurotransmitter responsible for this.
a) Acetycholine b) Norepiephrine c) Dopamine d) GABA

217. Aqueous chamber which is filled by aqueous humour is the space
a) Behind the lens
b) Between sclera and retina
c) Between cornea and lens
d) Between choroid and sclera

218. Human ear can be divided into
a) Outer ear b) Middle ear c) Inner ear d) All of these

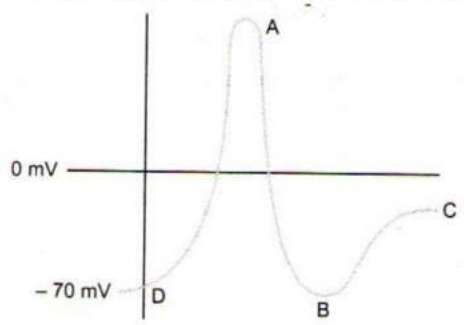
219. Which is an example of conditioned reflex?
a) Your keeping took up a stone then dog run away
b) Eye closed when anything enter into it
c) Hand took up when piercing with needle
d) Digestive food goes forward in alimentary canal

220. Glucose and oxygen are required by brain for constant supply of energy to control the functions of our body organs.
What will be the consequences if brain is deprived of oxygen and glucose?
I. Brain deprived of oxygen for just 5 minutes will get permanently damaged
II. Glucose is important in the nerve impulse conduction
III. One side of brain is unable to know, what the other side is doing, when it is deprived of oxygen
IV. Mental confusion will results if brain is deprived of glucose
a) I and II b) III and IV c) I and IV d) II and IV

221. The potential difference across the membrane of nerve fibre when it does not shown any physiological activity is called resting potential. It is about
a) -60 mV b) -80 mV c) +60 mV d) +90 mV

222. Which is the visible coloured portion of the eye?
a) Pupil b) Lens c) Iris d) Ciliary body

223. Refer the figure to answer the question.



Identify the region where all Na^+ channels are reactivated but closed and all K^+ channels are closed.
a) D b) C c) B d) A

224. The anterior portion of sclera is called
a) Iris b) Cornea c) Ciliary body d) Pupil

225. Arachnoid membrane is
a) Outer meninx b) Neurilemma c) Middle meninx d) Inner meninx

226. Cells of Schwann are associated with
a) Nervous tissue b) Skeletal muscle c) Cardiac muscle d) Connective tissue

227. Reflex action involves
a) Spinal cord b) Cerebellum c) Medulla oblongata d) Optic fibre

228. In humans, tympanic membrane is composed of connective tissues which is covered with
a) Skin outside and with mucus membrane inside b) Mucus membrane only
c) Mucus membrane outside and with skin inside d) Skin only

229. At blind spot
a) Optic nerves leave the eye and retinal blood vessels enter it
b) Retinal blood vessels leave the eye and optic nerves enter it
c) There is no involvement of optic nerves at all
d) There is no involvement of retinal blood vessels at all

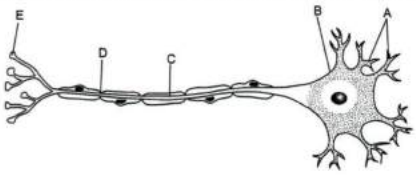
230. Wax gland present in the human ear canal is called
a) Sebaceous gland b) Mucous gland c) Ceruminous gland d) Sweat gland

231. Yellow spot is found in
a) Muscles b) Nerves c) Kidney d) Eyes

232. Function of ear ossicles in human is
a) To equalise the pressure on either sides of ear drum
b) Collects the vibrations in the air which produce sound

c) To increase the efficiency of transmission of sound waves to the inner ear
d) All of the above

233. Select the correct option to represent A to E in the given structure of a neuron



a) A-Dendrites, B-Cell body, C-Axon, D-Node of Ranvier, E-Synaptic knob
b) A- Axon, B-Myelin sheath, C-Schwann cell, D-Node of Ranvier, E-Axon terminal
c) A-Dendrites, B-Cell body, C-Schwann cell, D-Node of Ranvier, E-Synaptic knob
d) A-Axon, B-Cell body, C-Dendrites, D-Node of Ranvier, E-Axon terminal

234. Sclera of human eye is composed of
a) Blood vessels b) Ganglion cells c) Photoreceptor cells d) Connective tissue

235. The nerve centres which control the body temperature and the urge for eating are controlled by
a) Hypothalamus b) Pons c) Cerebellum d) Thalamus

236. Involuntary activities of the body are controlled by
a) Autonomic nervous system b) Somatic nervous system
c) Both (a) and (b) d) None of the above

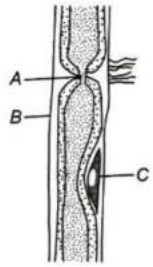
237. The cavity in the region of diencephalon in the brain of rabbit is called
a) Iter b) Third ventricle c) Lateral ventricle d) Foramen of Monro

238. Which one is correct about the focusing of the eye?
a) Hypermetropia (hyperopia) may be corrected by a diverging lens
b) The focus of the eye is controlled exclusively by the parasympathetic innervation of the ciliary body
c) The lens is the chief refractive element of the eye
d) When the eye focuses on a distant object, the ciliary muscle contracts

239. The part of the brain where the centre for hunger and thirst is located is
a) Cerebrum b) Hypothalamus c) Cerebellum d) Medulla oblongata

240. Given below are different components of reflex are
I. Effector organ
II. Interneuron
III. Motor neuron
IV. Sensory neuron
V. Sensory receptor
Arrange these in correct order of action potential that follows a sensory receptor stimulation
a) V, IV, III, II, I b) V, IV, II, III, I c) V, III, IV, I, II d) V, II, IV, III, I

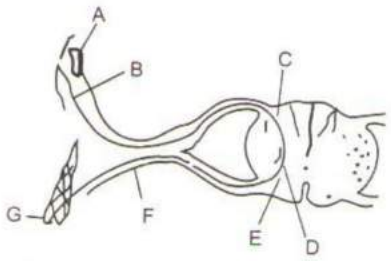
241. Given below the diagram of an axon. Label *A* to *C* correctly



a) A-Endoneurium, B-Neurolemma, C-Nucleus
b) A-Neurolemma, B-Endoneurium, C-Schwann cell
c) A-Node of Ranvier, B-Neurolemma, C-Schwann cell
d) A-Neurolemma, B-Node of Ranvier, C-Schwann cell

242. Internal ear is filled with
a) Perilymph b) Endolymph c) Lymph d) Both (a) and (b)
243. At the posterior pole of the eye lateral to the blind spot, there is a yellowish pigmented spot called
a) Corpus luteum b) Fovea c) Macula quadrigenina d) Macula lutea
244. The electrical potential difference between outside and inside of a nerve axon before excitation is known as
a) Resting potential b) Action potential c) Spike potential d) Reaction potential
245. Which of the following statement is incorrect?
a) CNS is the site of information processing and control
b) CNS includes brain and spinal cord
c) PNS comprises of all the nerves of the body associated with CNS
d) The nerve fibre of DNS are of two types, *i.e.,* afferent and efferent fibres
246. Taste area lies in the
a) Frontal lobe b) Occipital lobe c) Parietal lobe d) Temporal lobe
247. Functions of association areas in cerebral cortex includes
a) Intersensory associations b) Memory
c) Communication d) All of the above
248. In which of the following, Nissl's granules are found in?
a) Liver cells b) Nerve cells
c) Intestinal cells d) Uriniferous tubules
249. The purplish red pigment rhodopsin contained in the rods type of photoreceptor cells of the human eyes is a derivative of
a) Vitamin-C b) Vitamin-D c) Vitamin-A d) Vitamin-B
250. The functions of the organs/organ system in our body must be coordinated to maintain ..... Complete the given statement with reference to NCERT textbook
a) Muscular activity b) Homeostasis c) Respiration d) Neural coordination
251. Cerebral hemispheres of rat are connected by
a) Corpus luteum b) Corpus callosum
c) Corpus albicans d) Corpus spongiosum
252. Multipolar neurons are found in the
a) Retina of eye b) Cerebral cortex c) Embryonic stage d) None of these
253. The system, responsible for providing an organized network of point to point connections for a quick coordination, is called
a) Endocrine system b) Circulatory system c) Digestive system d) Neural system
254. The ..... nerve fibres are enveloped with Schwann cells, which form a myelin sheath around the axon
a) Myelinated b) Non-myelinatd c) Afferent d) Efferent
255. The black pigment layer in human eye, that reduces internal reflection is located in
a) Iris b) Retina c) Cornea d) Sclerotic
256. Which of the following is not an organ of central nervous system?
a) Brain b) Cranial nerves c) Spinal cord d) None of these
257. Dilatation of pupil takes place by
a) Sympathetic nervous system b) Parasympathetic nervous system
c) Central nervous system d) Both (a) and (b)
258. Ina myelinated neuron, two adjacent myelin sheaths are separated by gaps called
a) Nodes of Ranvier b) Synaptic cleft c) Schwann cells d) Synaptic knob
259. Which brain structure in rabbit is directly related to vision?
a) Corpus albicans b) Hippocampal lobe
c) Corpus callosum d) Corpora quadrigemina

260. The following diagram indicates the reflex arc. Identify the parts labeled as A, B, C, D, E ,F and G and choose the correct option.



a) A-Sense organ, B-Sensory nerve, C-Dorsal horn, D-Interneuron, E-Ventral horn, F-Motor nerve, G-Effector
b) A-Sense organ, B-Sensory nerve, C-Ventral horn, D-Interneuron, E-Dorsal horn, F-Motor nerve, G-Effector
c) A-Sense organ, B-Motor nerve, C-Dorsal horn, D-Interneuron, E-Ventral nerve, F-Sensory nerve, F-Effector
d) A-Effector, B-Motor nerve, C-Ventral horn, D-Interneuron, E-Dorsal horn, F-Sensory nerve, G-Sense organ

261. The gaps between two adjacent myelin sheaths is called
a) Synapse b) Synaptic gap c) Nodes of Ranvier d) Sheath gap

262. Sympathetic nerve accelerates heart beat due to
a) Adrenaline b) Nor-adrenaline c) Insulin d) Glucagon

263. Which of the following does not act as a neurotransmitter?
a) Acetylcholine b) Glutamic acid c) Epinephrine d) tyrosine

264. Odd nerve is
a) Optic b) Oculomotor c) Olfactory d) Auditory

265. Axons can be
a) Non-myelinated b) Myelinated c) Either (a) or (b) d) None of these

266. Schwann cells, form a myelin sheath around the
a) Dendrite b) Cell body c) Nucleus d) Axon

267. Which of the following nerves is purely motor nerve?
a) Vagus b) Facial c) Abducens d) Trigeminal

268. Choroid plexus functions to produce
a) Lymph b) Endolymph
c) Cerebrospinal fluid d) All of these

269. Along with hypothalamus, limbic system is involved in the
I. thermoregulation
II. regulation of sexual behavior
III. expression of emotional reactions (*e. g.*, excitement, pleasure, rage and fear)
IV. motivation
Choose the correct option
a) All except I b) Only I c) I, III and IV d) I, III and IV

270. Alzheimer's disease in human is associated with the deficiency of
a) Dopamine b) Glutamic acid
c) Acetylcholine d) Gamma Amino Butyric Acid (GABA)

271. Which of the following is a neuroglial cell?
a) Astrocytes b) Oligodendrocytes c) Microgila d) All of these

272. Outer ear of humans consists of
a) Pinna b) External auditory meatus
c) Both (a) and (b) d) Labyrinth

273. In eye donation, which one of the following parts of donor's eye is utilized?
a) Retina b) Cornea c) Lens d) Iris

274. At the neuromuscular function
a) The muscle membrane possesses muscluriae receptors
b) The motor nerve endings secrete norepinephrine
c) Curare leads to prolongation of neuromuscular transmission
d) The motor nerve endings secrete acetylcholine

275. Lipofucsin granules are found in
a) Nerve cell b) Cardiac muscle c) Red muscle d) Cartilage

276. Brain stem is formed by
a) Midbrain and forebrain b) Forebrain and hindbrain
c) Midbrain and hindbrain d) All of the above

277. Corti's organs is present in
a) Reissner's membrane b) Scala vestibuli
c) Basilar membrane d) Middle lamella

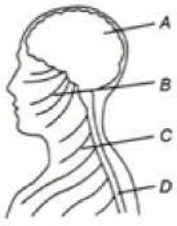
278. In parasympathetic nervous system, which of following is released?
a) Epinephrine b) Norepinephrine c) Serotonin d) Acetycholine

279. Following are the steps of mechanism of vision in random order
I. Neural impulses are analysed and image formed on retina is recognised by visual cortex
II. Membrane permeability changes
III. Ganglion cells are excited
IV. Bipolar cells are depolarized
V. Action potential (impulse) is transmitted by optic nerves to visual cortex
VI. Potential differences are generated in the photoreceptor cells
VII. Light energy causes a change in shape of rhodopsin, leading to the dissociation of retinal (an aldehyde of vitamin-A) from opsin (a protein)
VIII. Structure of opsin is changed
Choose the correct sequence
a) I, II, III, IV, V, VI, VII, VIII b) VIII, VII, VI, V, IV, III, II, I
c) I, IV, III, II, VII, VIII, VI, V d) VII, VIII, II, VI, IV, III, V, I

280. Nerve cells do not divide because they do not have
a) Nucleus b) Centrosome c) Golgi body d) Mitochondria

281. Arbor vitae is part of
a) Cerebrum b) Cerebellum c) Midbrain d) Forebrain

282. In the given diagram, identify the components of CNS from the codes given below



Codes
a) B and C b) B and D c) C and D d) A and D

283. Vitreous humour is
a) Colloid b) Watery fluid
c) Mucoid connective tissue d) All of the above

284. Sense of smell is perceived by
a) Pituitary b) Hypothalamus c) Olfactory lobe d) Cerebrum

285. In the central nervous system
a) White matter contains many nerve cell bodies
b) The myelin sheaths are formed by Schwann cells
c) The neurons are protected from changes in plasma composition
d) The cerebrospinal fluid (CSF) is an ultrafiltrate of plasma

286. Meissner's corpuscles occur in
a) Brain b) Nerve cells c) Skin d) Tongue

287. The wall of the human eyeball is composed of
a) Sclerotic, choroid and retinal layer b) Sclera, cornea and choroid
c) Sclera, cornea and ciliary body d) Sclera, choroid and iris

288. Thermoregulatory centre of human body is associated with
a) Cerebrum b) Cerebellum c) Hypothalamus d) Medulla oblongata

289. The axons transmit nerve impulses from the cell body to a
a) Synapse b) Dendrite of the same cell
c) Axon of another cell d) All of these

290. Grey matter of the brain is
I. present outside the white matter
II. matter containing medullated nerve fibres
III. grey in colour
IV. matter containing cell bodies
Which of the statements mentioned above are correct?
a) Only I b) Only II c) I, III and IV d) II, III and IV

291. In the central nervous system, myelinated fibres form the ..., while the non-myelinated fibre cells form the .....
a) Grey matter, white matter b) White matter, grey matter
c) Ependymal cells, neurosecretory cells d) Neurosecretory cells, ependymal cells

292. Pneumotaxic centre which can moderate the functions of the respiratory rhythm centre is present at
a) Pons region of brain b) Thalamus
c) Spinal cord d) Right cerebral hemisphere

293. Which of the following cranial nerves is present in rabbit but absent in frog?
a) Glossopharyngeal b) Hypoglossal c) Olfactory d) Optic

294. Hypothalamus does not control
a) Hunger and satiety b) Thermoregulation c) Osmoregulation d) Emotions

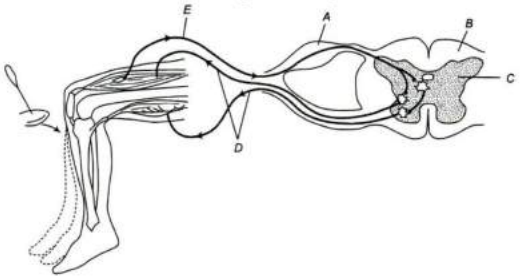
295. Arrange the following events in a correct order that lead to the formation of an auditory impulse in human ears from the codes given below
I. Vibration is transferred from the malleus to the incus and then to stapes
II. Basiliar membrane moves up and down
III. Nerve impulse is transmitted by cochlear nerve to auditory cortex of brain for impulse analysis and recognition
IV. Sound waves pass through ear canal
V. Stereocilia of hair cells of organ of Corti rub against tectorial membrane
VI. Sound waves causes ear drum to vibrate
VII. Nerve impulse is generated
VIII. Vibrations move from fluid of vestibular canal to the fluid tymapanic canal
IX. Membrane at oval window vibrates
Codes
a) IV, VI, I, IX, VIII, II, V, VII, III b) I, II, III, IV, V, VI, VII, VIII, IX

c) IX, VIII, VII, VI, V, IV, III, II, I
d) IV, VI, I, VIII, IX, II, V, VII, III

296. Which is the largest body cell?
a) Neurons b) RBCs c) Osteocytes d) Sperms

297. Which one of the following pairs of structures distinguishes a nerve cell from other types of cell?
a) Perikaryon and dendrites
b) Vacuoles and fibres
c) Flagellum and medullary sheath
d) Nucleus and mitochondria

298. Identify the parts labelled as A and E and choose the correct option for the diagrammatic representation of reflex action showing knew-jerk reflex



a) A-Dorsal root ganglion, B-White matter, C-Gray matter, D-Afferent pathway, D-Efferent pathway
b) A-Dorsal root ganglion, B-White matter, C-Gray matter, D-Efferent pathway, D-Afferent pathway
c) A-Dorsal root ganglion, B-Gray matter, C-White matter, D-Efferent pathway, D-Afferent pathway
d) A-Ventral root ganglion, B-White matter, C-Gray matter, D-Efferent pathway, D-Afferent pathway

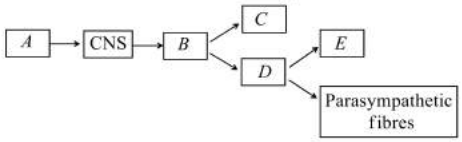
299. The medulla contains centres which control
a) Respiration
b) Cardiovascular reflexes
c) Gastric secretions
d) All of the above

300. Cranium is the protective covering of
a) Lungs b) Eye balls c) Brain d) Uterus

301. The number of cranial nerves in frog and man is
a) 10 and 12 b) 12 and 10 c) 10 and 8 d) 8 and 10

302. The chemical used by doctors to dilate pupil for examination is
a) Pilocarpine b) Atropine c) Actinomycin-D d) Acetylcholine

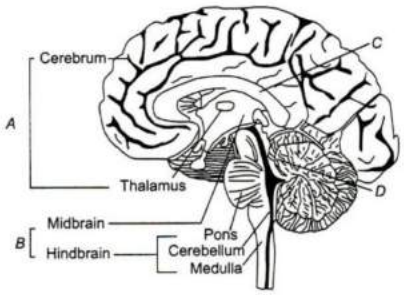
303. Select the correct arrangement of fibres $(A - E)$ in the diagram given below



a) A-Afferent, B-Efferent, C-Somatic motor, D-Autonomic, E-Sympathetic
b) A-Efferent, B-Afferent, C-Somatic motor, D-Autonomic, E-Sympathetic
c) A-Afferent, B-Efferent, C-Autonomic, D-Somatic motor, E-Sympathetic
d) A-Efferent, B-Afferent, C-Autonomic, D-Somatic motor, E-Sympathetic

304. Identify the wrong pair
a) Corpus luteum-Progesterone
b) Interstitial cells-Testosterone
c) Hypothalamus-FSH
d) Acrosome - Hyaluronidase

305. Given is the diagram of human brain
Identify A, B, C and D correctly



a) A-Forebrain, B-Brain stem C-Corpus callosum, D-Cerebral aqueduct
b) A-Forebrain, B-Brain stem C-Cerebral aqueduct, D-Corpus callosum
c) A-Forebrain, B-Brain stem C-Corpus callosum, D-Cerebral aqueduct
d) A-Forebrain, B-Brain stem C-Cerebral aqueduct, D-Corpus luteum

306. A synapse is formed by the membrane of
a) Presynaptic axon and a postsynaptic dendrite
b) Presynaptic dendrite and postsynaptic axon
c) Presynaptic dendrite and postsynaptic dendrite
d) None of the above

307. A neuron is said to be in resting state when,
I. it is not conducting any impulse
II. plasma membrane is electrically positive outside and negative inside
III. the nerve fibre is stimulated mechanically or electrically
IV. plasma membrane is negative outside and positive inside
The correct option is
a) III and IV
b) I and IV
c) II and III
d) I and II

308. Patients suffering from cholera are given a saline drip because
a) Na^+ ions help in stopping nerve impulses and hence, sensation of pain
b) Na^+ ions help in the retention of water in the body tissues
c) NaCl is an important component of energy supply
d) NaCl furnishes most of the fuel required for cellular activity

309. Which part of retina consists of only cones?
a) Fovea centralis
b) Optic nerve
c) Blind spot
d) Chiasmata

310. Following are some nerves. Categorise them as afferent, efferent and mixed nerves according to their nature and than choose the correct option from the codes given below
I. Trigeminal nerves
II. Occulomotor nerves
III. Olfactory nerves
IV. Auditory cranial nerves
V. Hypoglossal cranial nerves
VI. Spinal accessory cranial nerves
VII. Optic nerves
VIII. Abducens nerves
IX. Pathetic nerves
X. Glossopharyngeal nerves
XI. Vagus cranial nerves
XII. Spinal nerves
XIII. Facial nerves

Codes

	Afferent nerves	**Efferent nerves**	**Mixed nerves**
a)	III, VII, IV	II, IX, VIII, VI, V	I, XIII, X, XI, XII
b)	I, XIII, X, XI, XII	III, VII, IV	II, IX, VIII, VI, V
c)	II, IX, VIII, VI, V	I, XIII, X, XI, XII	III, VII, IV

d) III, VII, VIII XIII, XI, V, VI I, II, IV, IX, X, XII

311. The glands, which help on absorbing odoriferous substances to stimulate olfactory nerve are
a) Cerumenous glands b) Meibomian glands c) Bowman's glands d) Cowper's glands

312. Which of the following is motor nerve?
a) Accessory spinal b) Vagus c) Trigeminal d) Facial

313. True about electrical synapses
I. pre and postsynaptic neurons are in very close proximity
II. pre and postsynaptic neurons are separated by synaptic cleft
III. impulse transmission is very fast
IV. electrical synapses are common in our system
Select the correct option
a) I, II, III and IV b) I and III c) II and IV d) I and II

314. If frog's brain is crushed, even than its leg moves on pinpointing. It called as
a) Conditional reflex b) Simple reflex
c) Neurotransmitter function d) Autonomic nerve conditions

315. Which of the following statements is correct about the nodes of ranvier?
a) Axolemma is discontinuous
b) Myelin sheath is discontinuous
c) Both neurilemma and myelin sheath are discontinuous
d) Covered by myelin sheath

316. Inner part of cerebral cortex is referred as
a) White matter b) Grey matter
c) Both (a) and (b) d) Non-myelinated nerve fibres

317. Brains acts as the ...A... and ...B... system.
Here, A and B refer to
a) Command; control b) Voluntary; involuntary
c) Compound; voluntary d) Control; involuntary

318. Old age far sightedness is a defect of eye in which
a) Lens becomes opaque b) Eyeball becomes small
c) Eyeball becomes long d) Lens loses its elasticity

319. Muller's fibres occurs in
a) Heart b) Kidney c) Pancreas d) Retina

320. Memory is the responsibility of
a) Grey matter b) White matter c) Cerebrum d) Cerebellum

321. Intercellular communication in multicellular organism occurs through
a) Digestive system only
b) Respiratory system only
c) Nervous system only
d) Both nervous and endocrine system

322. Which of the following statements are is correct?
I. Dendrites are long fibre, with branched distal end
II. Axons are short fibres which arise from the cell body
III. Cell body of a neuron contains cytoplasm, nucleus with cell organelles and Nissl's granules
IV. The dendrites transmits nerve impulses away from the cell body to a synapse
The correct option is
a) Only III b) I and II c) I, II and III d) I, II and IV

323. The rods and cones of the retinal layer of eye are modified
a) Hairs b) Unipolar neurons

c) Bipolar neurons d) Multipolar neurons

324. The order of the three layers of cells in the retina of human eye from inside to outside is
a) Bipolar cells, photoreceptor cells, ganglion cells
b) Ganglion cells, rods, cones
c) Ganglion cells, bipolar cells, photoreceptor cells
d) Photoreceptor cells, ganglion cells, bipolar cells

325. Synaptic vesicles contains chemicals called
a) Synaptic fluid b) Neurotransmitters c) Vesicular fluid d) All of these

326. The neurons may be
a) Multipolar b) Bipolar c) Unipolar d) All of these

327. The outermost covering of brain is
a) Duramater b) Arachnoid c) Pigamater d) Choroid layer

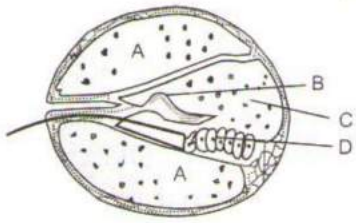
328. In humans, tympanic membrane (ear drum) separates lympanic cavity from
a) Pinna b) Auditory meatus c) Eustachian tube d) Cochlea

329. At their resting stage, the body cells exhibit a potential of -5 to -100 mV known as
a) Polarization b) Resting potential c) Repolarization d) Depolarization

330. Our paired eyes are located in sockets of the skull called
a) Orbits b) Cornea c) Iris d) Lens

331. The decoding and interpretation of visual information is carried out by which part of the brain?
a) Cerebellum b) Frontal lobe c) Parietal lobe d) Occipital lobe

332. Given below is a diagrammatic cross-section of a single loop of human cochlea.



Which one of the following options correctly represents the name of three different parts?
a) A-Tectorial membrane B-Perilymph
C-Secretory cells D-Endolymph
b) A-Endolymph B-Sensory hair cells
C-Serum D-Tectorial membrane
c) A-Sensory hair cells B-Endolymph
C-Tectorial membrane D-Perilymph
d) A-Perilymph B-Tectorial membrane
C-Endolymph D-Organ of Corti

333. For the maintenance of ionic gradients across the resting membrane, the sodium-potassium pump transports
a) $3Na^+$ outwards for $2K^+$ into the cell b) $2Na^+$ outwards for $2K^+$ into the cell
c) $3Na^+$ inwards for $2K^+$ out the cell d) $2Na^+$ inwards for $2K^+$ out the cell

334. Comprehension of spoken and written words take place in the region of
a) Association area b) Motor area c) Wernicke's area d) Broca's area

335. Excessive stimulation of vagus nerve in humans may lead to
a) Hoarse voice b) Peptic ulcers
c) Efficient digestion of proteins d) Irregular contraction of diaphragm

336. Pupil, is the aperture surrounded by the
a) Ciliary body b) Connective tissue c) Iris d) Choroid

337. In which direction, cristae of rabbit ear helps in maintaining balance?
a) Circular position of longitudinal axis of semi circular canals
b) Transverse position of longitudinal axis of semi circular canals
c) Parallel to longitudinal axis of semi circular canals
d) All of the above

338. The inner parts of cerebral hemispheres and a group of associated deep structures like amygdala, hippocampus, etc. form a complex structure called
a) Arbor vitae
b) Limbic lobe/limbic system
c) Corpora quadrigemina
d) Reticular system

339. Rhodopsin is also known as visual
a) Red
b) Yellow
c) Brown
d) Purple

340. What are the two types of nervous system cells?
a) Alveoli and veins
b) Alveoli and bronchioles
c) Neurons and nephrons
d) Neurons and glia

341. Which of the following statements is true?
a) Saltatory conduction is seen in non-myelinated nerve fibres
b) Nissl's granules are found in muscles fibres
c) Non-myelinated nerve fibres do not posses nodes of Ranvier
d) Non-myelinated nerve fibres are completely enclosed by myelin sheath

342. Nerve cells do not possess
a) Neurilemma
b) Sarcolemma
c) Dendrite
d) Axon

343. Which of the following is an example of conditioned reflex?
a) Breast feeding
b) Swallowing of food
c) Blinding of eyes
d) Salivation in dog on seeing bread

344. Select the correct arrangement of neural organization, according to the increasing degree of complexity
a) Lower invertebrates → Vertebrates → Insects
b) Lower invertebrates → Insects → Vertebrates
c) Vertebrates → Insects → Lower vertebrates
d) Vertebrates → Lower invertebrates → Insects

345. 'Organ of Jacobson' helps in
a) Touch
b) Vision
c) Smell
d) Hear

346. The nerve cells exercise its control by sending electrical signals called
a) Afferent nerve impulses
b) Efferent nerve impulses
c) Electrical impulses
d) Nerve impulses

347. Synapse is the connection between
a) Two axon
b) Two dendrites
c) Axon and dendrites
d) Two neurons

348. A person went to ophthalmologist. He had a problem in reading because he was not able to
a) Contract his iris
b) Contract ciliary muscle
c) Contract his pupil
d) Contract his ligaments

349. The size of pupil is controlled by the
a) Ciliary muscles
b) Suspensory ligaments
c) Cornea
d) Iris muscles

350. Which of the following is correct regarding electrical synapses?
I. Pre and postsynaptic membrane neurons are in very close proximity at electric synapse
II. Electric current are involved in the transmission of impulses
III. Transmission of an impulse across electrical synapses is very similar to impulse conduction along a single axon
IV. Impulse transmission is always faster in electric synapse than that across a chemical synapse
V. Electrical synapses are rare in our system
The correct option is

a) I, II, III and IV b) I, III, IV and V c) I, II and IV d) I, II, III, IV and V

351. Which of the following is present in rod cells and useful in night vision?
a) Vitamin-K b) Melanin c) Rhodopsin d) Vitamin-C

352. ..... nerve fibre is enclosed by a Schwann cell that do not form a myelin sheath around the axon
a) Afferent b) Unmyelinated c) Myelinated d) Efferent

353. In the resting stage of a neuron, concentration gradient generates due to
a) High concentration of K^+ and low concentration of Na^+ inside the axon
b) High concentration of Na^+ and low concentration of K^+ inside the axon
c) low concentration of Na^+ outside the axon
d) low concentration of K^+ outside the axon

354. Scala vestibuli, scala media and scala tympani of human ear contains
a) Perilymph, endolymph and perilymph respectively
b) Endolymphy, perilymph and endolymph respectively
c) Perilymphy, endolymph and endolymph respectively
d) Perilymph, haemolymph and endolymph respectively

355. An action potential in the nerve fibre is produced when positive and negative charges on outside and the inside of the axon membrane are reversed because
a) More potassium ions enter the axon as compared to sodium ions leaving it
b) More sodium ions enter the axon as compared to potassium ions leaving it
c) All potassium ions leave the axon
d) All sodium ions enter the axon

356. Nissl's granules are found in
a) Cell body b) Dendrites c) Both (a) and (b) d) Axon

357. Which statements are wrong?
I.Synaptic cleft of neurons secrete adrenaline.
II.Myelinated nerve fibres are enveloped with Schwann cells, which form a myelin sheath around the axon.
III.Non-myelinated nerve fibre is enclosed by a Schwann cell that does not form myelin sheath.
IV.Spinal cord and cranial nerves are made of non-myelinated nerve fibres.
Of the four statements,
a) I, II are correct but III and IV are incorrect
b) I, II and III are correct but IV is incorrect
c) III and IV are correct but I and II are incorrect
d) II and III are correct but I and IV are incorrect

358. The central information processing organ of our body is
a) Heart b) Spinal cord c) Brain d) All of the above

359. Which of the following statements are correct for cones of human eye?
I. Cones are responsible for daylight vision
II. Cones are responsible for colour vision
III. Cones are responsible for photopic vision
Choose the correct option
a) Only I b) I and II c) II and III d) I, II and III

360. During synaptic excitation
a) The membrane potential of the post-synaptic cell hyperpolarizes
b) The epsps are all or none in nature
c) The epsps can summate
d) After an epsp the photosynaptic cell passes through a refractory period

361. Which of the following is correct for the pairs of cervical nerves and number of cervical vertebrae respectively?
a) 8 and 7 b) 16 and 7 c) 7 and 7 d) 7 and 16

362. The nerve fibre in its resting stage is
a) More permeable to K^+ b) Semi-permeable to K^+
c) Less permeable to K^+ d) All of these

363. Movement of tongue muscle is controlled by
a) Facial nerve b) Trigeminal nerve c) Hypoglossal nerve d) Vagus nerve

364. Alimentary canal is supplied by
a) Olfactory b) Optic c) Trigeminal d) Vagus

365. The retina of nocturnal birds contain
a) Cones only b) Rods only c) Both (a) and (b) d) None of these

366. What is the space between arachnoid and piamater?
a) Supra-arachnoid space b) Sub-arachnoid space
c) Sub-dural space d) Meninges

367. Choose the odd pair out in the following.
a) Areolar connective tissue-Collagen b) Epithelium-Keratin
c) Neuron-Melanin d) Muscle fibre-Actin

368. Sympathetic nervous system controls
a) Erections of hairs b) Whitening of hairs c) Withdrawl of hairs d) All of the above

369. Dendrites are
a) Branched short fibres b) Projections out of the cell body
c) Nissl's granules containing body d) All of the above

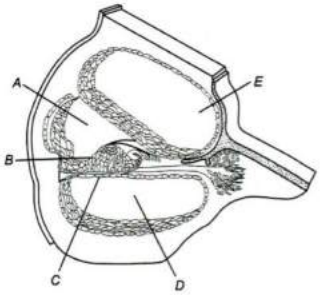
370. Sensation of stomach pain is due to
a) Interoceptors b) Exteroceptors c) Proprioceptors d) Teloceptors

371. ...A... is attached to the tympanic membrane and the ...B... is attached to the oval window of the cochlea Choose the correct option for A and B
a) A-Malleus, B-stapes b) A-Malleus, B-incus c) A-Stapes, B-malleus d) A-Incus, B-stapes

372. In which part of the brain, satiety centres is present?
a) Cerebellum b) Medulla oblongata c) Cerebral hemisphere d) Hypothalamus

373. Which of the following is correct for lens focusing while seeing distant object?
a) Tightly stretched suspensory ligament and rounded lens
b) Contracted ciliary muscles and rounded lens
c) Relaxed ciliary muscles and tightly stretched suspensory ligament
d) Contracted ciliary muscles and relaxed suspensory ligaments

374. Below is the diagram of the sectional view of cochlea of human ear. Identify *A* and *E*



Choose the correct option
a) A-Scala media, B-Organ of Corti, C-Basiliar membrane, D-Scala tympani, E-Scala vestibuli
b) A-Scala vestibuli, B-Organ of Corti, C-Basiliar membrane, D-Scala tympani, E-Scala media
c) A-Scala vestibuli, B-Basiliar membrane, C-Organ of Corti, D-Scala tympani, E-Scala media

d) A-Scala vestibuli, B-Basiliar membrane, C-Scala tympani, D-Organ of Corti, E-Scala media

375. The cell body of neuron contains certain granular bodies called
a) Cell granules b) Neuro cells c) Nissl's granules d) Neurogranules

376. Pinna
a) Collects the vibrations in the air which produce sound
b) Are wax secreting glands
c) Increase the efficiency of transmission of sound waves to the inner ear
d) All of the above

377. Light sensitive cells of eye are present in
a) Retina b) Cornea c) Iris d) Choroid

378. Which of the following statements are incorrect?
I. The space between cornea and lens is filled with watery fluid
II. Rhodopsin is red protein, hence called visual red
III. The anterior transparent portion of choroid is called cornea
IV. When all cones are stimulated equally, a sensation of no light (dark) is produced
Choose the correct option
a) Only II b) I and III c) All are correct d) All except II

379. In *Hydra*, neural organization is comprises of
a) Network neurons b) CNS and PNS c) CNS d) PNS

380. Schwann cell is found around
a) Axon b) Cyton c) Dendrite d) Dendron

381. The human ear is equipped to register sounds of frequencies between
a) 20 to 20,000 cycles per second b) 1000 to 2000 cycles per second
c) 5000 to 7000 cycles per second d) 5,000 to 10,000 cycles per second

382. I. The endocrine system provides chemical integration through hormones
II. The neural system provides an oragnised network of point to point connection for a quick coordination
III. The neural organization is very complex in lower invertebrates
IV. The human neural system includes CNS and PNS
Select the correct statements
a) Only I b) I and II c) I, II and IV d) I, II and III

383. The tract of nerve fibres which connects the cerebral hemisphere is
a) Corpus luteum b) Corpus callosum
c) Corpora quadrigemina d) Cerebral aqueduct

384. Eustachian canal connects
a) Middle ear with external ear b) Middle ear with internal ear
c) External ear with internal ear d) Pharynx with middle ear

385. Which has H-shaped grey matter?
a) Cerebrum b) Medulla oblongata c) Cerebellum d) Spinal cord

386. Which part of CNS mainly controls the reflex?
a) Cerebellum b) Pons c) Spinal cord d) Cerebral aqueduct

387. Respiratory control centre is
a) Cerebellum b) Medulla oblongata c) Spinal cord d) cerebrum

388. Olfactoreceptors are
a) Touch receptors b) Pain receptors
c) Smell receptors d) Pressure receptors

389. In nerve fibre, the impulses transmits quickly due to
a) Myelin sheath b) Nodes of Ranvier c) Both (a) and (b) d) None of the above

390. Labyrinth, fluid-filled inner ear consists of

a) Bony labyrinth
b) Membranous labyrinth
c) Both (a) and (b)
d) Ear drum

391. The sound producing organ of bird is
a) Oropharynx b) Nasopharynx c) Glottis d) Syrinx

392. Reflex arc in the nervous system means
a) A functional unit consisting of a receptor neural pathway and an effector neuron
b) Peripheral nerves, spinal cords and brain
c) A homeostatic system of sensory nerves, synapses and motor nerves
d) An inherited behaviour pattern that functions through a certain neural pathway

393. Salivation in man is under the control of
a) Medulla oblongata b) Mesencephalon c) Hypothalamus d) Cerebellum

394. Static equilibrium is maintained by
a) Utriculus
b) Sacculus
c) Both (a) and (b)
d) Semi-circular canals

395. Human ears perform sensory functions. These are
a) Hearing organs
b) Maintenance of body balance
c) Both (a) and (b)
d) Voice production

396. When a neuron is in resting state, *i. e.*, not conducting any impulse, the axonal membrane is
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

397. Different cranial nerves, with their respective functions are given below. Choose the correct option from the codes given below

Name	Function
I. Hypoglossal	Hearing equilibrium
II. Glossopharyngeal	Movements of pharynx, larynx, neck, and shoulder
III. Pathetic	Rotation of eyeball
IV. Oculomotor	Movement of eyeball

Codes
a) I and II b) II and IV c) III and IV d) I, II, III and IV

398. In humans, gustatoreceptors are found in
a) Eyes b) Ears c) Tongue d) Stomach

399. 'Pons Varolii' connects the
a) Two cerebral hemispheres
b) Two lobes of cerebellum
c) Cerebrum and cerebellum
d) Spinal cord with the brain

400. There are different types of cones to human eye that responds to
a) Red and green lights
b) Green and blue lights
c) Red and blue lights
d) Red, green and blue lights

401. Cerebrospinal fluid is present
a) Beneath the piamater
b) Between piamater and arachnoid
c) Between arachnoid and duramater
d) In extra duramater

402. Unipolar neurons can be seen in the
a) Embryonic stage b) Cerebellum c) Cerebral cortex d) Retina of eye

403. Which is thickened to form organ of Corti?
a) Reissner's membrane
b) Basilar membrane
c) Tectorial membrane
d) All of these

404. Which of the following cells are associated with identification of colours in bright light?
a) Rod cells b) Cone cells c) Both (a) and (b) d) None of these

405. Synapses are of two types namely ...A... synapses and ...B... synapses. Here A and B refers to
a) Neuron-neuron, chemical b) Electrical, chemical
c) Neuron-neuron, electrical d) Electrochemical, neuron

406. Select the correct statements
a) Neurons regulates endocrine activity but not *vice-versa*
b) Endocrine glands regulates neural activity but not *vice-versa*
c) Endocrine glands regulates neural activity and nervous system regulates endocrine glands
d) Neither hormones control neural activity nor the neurons control the endocrine activity

407. Which one of the following does not act as a neurotransmitter?
a) Acetycholine b) Epinephrine c) Norepinephrine d) Cortisone

408. Damage to hearing is caused by sound which exceeds
a) 70 decibels b) 100 decibels c) 110 decibels d) 120 decibels

409. Choroid becomes thick in the anterior part of eye to form the
a) Iris b) Ciliary body c) Pupil d) Lens

410. Gustatoreceptors are
a) Rod cells of eyes b) Taste buds of tongue
c) Epithelium of skin d) Cone cells of eye

411. A man is admitted in a hospital. He is suffering from an abnormally low body temperature, loss of appetite and extreme thirst. His brain scan would probably show a tumour in
a) Medulla oblongata b) Pons Varolii c) Cerebellum d) Hypothalamus

412. Eustachian tube connects ...A... cavity with ...B...
Choose the correct option for A and B
a) A-outer ear; B-pharynx b) A-inner ear; B-pharynx
c) A-pinna; B-pharynx d) A-middle ear; B-pharynx

413. The autonomic nervous system has control over
a) Reflex action b) Skeletal muscles
c) Sense organs d) Internal organs

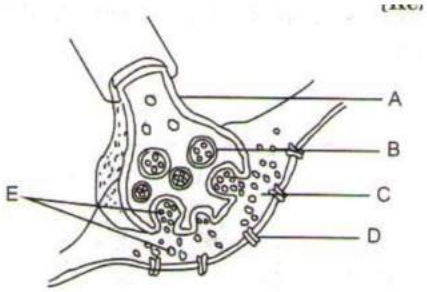
414. How many pairs of cranial nerves originate from the brain of rabbit?
a) 12 b) 8 c) 9 d) 11

415. The gelatinous, elastic membrane covering the sensory hair cells of the human ear is known as
a) Basilar membrane b) Tectorial membrane
c) Reissners's membrane d) Neuro-sensory membrane

416. The joint between axon of a neuron and the dendrite of the next is called
a) Synapse b) Bridge c) Junction d) Joint

417. Reflex action is controlled by
a) ANS b) CNS c) Both (a) and (b) d) None of the above

418. In the following diagram showing axon terminal and synapse A, B, C, D and e respectively represents



a) A-axon terminal B-synaptic cleft C-synaptic vesicles D-neurotransmitters E-receptors
b) A-axon terminal B-synaptic cleft C-synaptic vesicles D-receptors E- neurotransmitters
c) A-synaptic cleft B-synaptic vesicles C-axon terminal D- neurotransmitters E-receptors
d) A-synaptic cleft B-axon terminal C-synaptic vesicles D- neurotransmitters E-receptors

419. Cerebellum portion of brain is
a) Concerned with the maintenance of posture/equilibrium
b) Responsible for olfactory functions
c) Controls optic functions
d) Both (a) and (c)

420. Choose the correct option from the codes given below
I. Nearly 50% of all brain cells are neuroglia
II. Oligodendrocytes plays a role in the maintenance of the blood brain barrier
III. Microglia engulf microbes and cellular debris
IV. Astrocytes, oligodendrocytes and microglia, are three different types of neuroglial cells
Codes
a) I and IV are correct only
b) II and IV are correct only
c) All are incorrect
d) All are correct

421. The bones lie inferior to the parietal bones and meet them at the squamous sutures is
a) Frontal bone b) Temporal bone c) Occipital bone d) Parietal bone

422. Choroid plexus is a network of
a) Capillaries b) Muscle fibres c) Nerves d) Lymph vessels

423. Which part of brain is associated with strong emotions?
a) Limbic system b) Medulla c) Cerebellum d) Cerebral cortex

424. The human brain is well protected by the
a) Skull b) Meninges c) Hairs d) Piamater

425. A wave of action potential is termed as
a) Sensory impulse b) Nerve impulse c) Activation impulse d) Motor impulse

426. The sensations of different colours in human eye is produced due to the combination of
a) Rods and their photopigments
b) Red and blue lights
c) Cones and their photopigments
d) Red and green lights

427. Olfactory smell area is present in
a) Frontal lobe b) Parietal lobe c) Temporal lobe d) Occipital lobe

428. The function of vagus nerve innervating the heart is to
a) Initiate the heart beat
b) Reduce the heart beat
c) Accelerate the heart beat
d) Maintain constant heart beat

429. Aqueduct of Sylvius occurs in

a) Eye b) Heart c) Brain d) Ear

430. Nerve impulse initiates with the movement of
a) K^+ b) Na^+ c) Ca^+ d) Mg^+

431. Given below is a table comparing the effects of sympathetic and parasympathetic nervous system for four features (a-d).which one feature is currently described?

Feature	Sympathetic Nervous System	Parasympathetic Nervous System
a) Salivary gland	Stimulates secretion	Inhibits secretion
b) Pupil of the eye	Dilates	Constricts
c) Heart rate	Decreases	Increases
d) Intestinal peristalsis	Stimulates	Inhibits

432. What is the location of hypothalamus?
a) At the base of the cerebellum b) At the base of the thalamus
c) Above the thalamus d) Above the cerebellum

433. Which is a bridge between nervous system and endocrine system?
a) Thalamus b) Hypothalamus c) Limbic system d) Parietal lobe

434. Broca's area is connected with
a) Learning and reasoning b) Speech function
c) Receiving the impulses from eyes d) Sensation of smell

435. Myelinated fibres of the tract of pons forms
a) Red matter b) Grey matter c) White matter d) Both (b) and (c)

436. The PNS includes
a) Central neural system and sympathetic neural system
b) Somatic neural system and autonomic neural system
c) Only sympathetic neural system
d) Only somatic neural system

437. 31 pairs of spinal nerves are known in man. Select the option which shows its correct classification into different groups
a) Cervical-1 pair, thoracic-8 pair, lumber-12 pairs, sacral-5 pairs, coccygeal-5 pairs
b) Cervical-8 pairs, thoracic-12 pairs, lumber-5 pairs, sacral-5 pairs, coccygeal-1 pairs
c) Cervical-5 pairs, thoracic-5 pairs, lumber-5 pairs, sacral-8 pairs, coccygeal-1 pairs
d) Cervical-5 pairs, thoracic-8 pairs, lumber-5 pairs, sacral-12 pairs, coccygeal-1 pairs

438. Cerebellum and medulla together constitutes
a) Hindbrain b) Midbrain
c) Forebrain d) Telencephalon

439. Hindbrain includes
a) Pons b) Cerebellum c) Medulla oblongata d) All of the above

440. The complex system of the inner ear associated with maintenance of body balance is
a) Cochlea b) Reissner's membrane
c) Vestibular apparatus d) Basilar membrane

441. The one way or unidirectional transmission of nerve impulse in nerve cells is due to the presence of
a) Synapses b) Myelin sheath c) Membrane polarity d) Interneurons

442. Post-ganglionic nerve fibres of sympathetic system are
a) Adrenergic b) Cholinergic c) Both (a) and (b) d) None of these

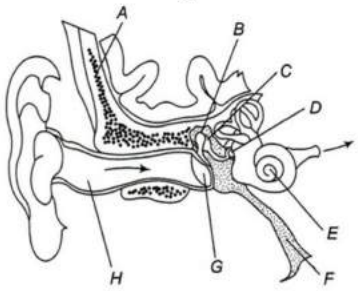
443. The membrane, which cover the brain and spinal cord is/are called

a) White matter b) Grey matter c) Peritoneum d) Meninges

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

445. The ...A... is a structure located on the ...B... which contains ...C... that acts as auditory receptors
Choose the correct option for A, B and C
a) A-basilar membrane, B-tectorial membrane, C-hair cells
b) A-basilar membrane, B-tectorial membrane, C-hair cells
c) A-basilar membrane, B-hair cells, C-tectorial membrane
d) A-organ of corti, B-basilar membrane, C-hair cells

446. Given is the diagram of ear. Identify *A* to *H*



Choose the correct option
a) A-Temporal bone, B-Malleus, C-Incus, D-Stapes, E-Cochlea, F-Eustachian tube, G-Tympanic membrane, H-External auditory canal
b) A-Tympanic membrane, B-Malleus, C-Incus, D-Stapes, E-Cochlea, F-Eustachian tube, G-Temporal bone, H-External auditory canal
c) A-Tympanic membrane, B-Incus, C-Malleus, D-Stapes, E-Cochlea, F-Eustachian tube, G-Temporal bone, H-External auditory canal
d) A-Temporal bone, B-Malleus, C-Incus, D-Cochlea, E-Stapes, F-Eustachian tube, G-lympanic membrane, H-External auditory canal

447. The posterior part of the retina, which is just opposite to the lens is
a) Cornea b) Yellow spot c) Fovea centralis d) Both (A) and (B)

448. Corpus callosum connects
a) Two cerebral hemispheres b) Two ventricles of brain
c) Two cerebellar hemispheres d) Two optic thalamus

449. The innermost layer of the human eye is
a) Choroid b) Cornea c) Sclera d) Retina

450. Which function will be lost due to damage of occipital lobe?
a) Hearing b) Speech c) Vision d) Memory

451. Neuron is composed of
a) Cell body b) Dendrites c) Axon d) All of these

452. Trigeminal nerve in frog is of
a) IV b) V c) VIII d) IX

453. Vomiting centre is located in the
a) Medulla oblongata b) Stomach and sometimes in duodenum
c) GI tract d) Hypothalamus

454. Mouth becomes watery when we look on the delicious food is due to
a) Olfactory response b) Hormonal response
c) Neural response d) Optic response

455. The sequence of ear ossicles from outside to inside is
a) malleus → incus → stapes b) incus → stapes → malleus

c) stapes → incus → malleus
d) malleus → stapes → incus

456. In rhodopsin, the vitamin present is
a) Vitamin-B
b) Vitamin-C
c) Vitamin-A
d) Vitamin-D

457. In human eyes, colour perception is done by
a) Rod cells only
b) Cone cells only
c) Both (a) and (b)
d) Choroid layer cells

458. Path of reflex action is
a) Receptor → Brain → Muscles
b) Receptor → Spinal cord → Muscles
c) Muscles → Receptor → Brain
d) Muscles → Spinal cord → Muscles

NEURAL CONTROL AND COORDINATION

: ANSWER KEY :

1)	b	2)	d	3)	d	4)	b	165)	c	166)	d	167)	c	168)	a
5)	c	6)	d	7)	a	8)	c	169)	b	170)	d	171)	a	172)	c
9)	d	10)	b	11)	a	12)	a	173)	a	174)	c	175)	a	176)	d
13)	a	14)	b	15)	d	16)	a	177)	a	178)	c	179)	c	180)	c
17)	a	18)	a	19)	c	20)	b	181)	c	182)	a	183)	c	184)	d
21)	a	22)	d	23)	b	24)	d	185)	a	186)	c	187)	d	188)	c
25)	c	26)	d	27)	b	28)	d	189)	a	190)	d	191)	d	192)	d
29)	a	30)	a	31)	c	32)	b	193)	a	194)	a	195)	a	196)	a
33)	c	34)	c	35)	a	36)	a	197)	d	198)	d	199)	b	200)	a
37)	c	38)	a	39)	a	40)	a	201)	b	202)	a	203)	b	204)	b
41)	c	42)	c	43)	c	44)	d	205)	d	206)	c	207)	c	208)	d
45)	c	46)	a	47)	b	48)	a	209)	c	210)	c	211)	a	212)	b
49)	b	50)	c	51)	c	52)	b	213)	b	214)	b	215)	d	216)	c
53)	d	54)	c	55)	d	56)	d	217)	c	218)	d	219)	a	220)	c
57)	a	58)	b	59)	b	60)	a	221)	a	222)	c	223)	b	224)	b
61)	c	62)	b	63)	b	64)	b	225)	c	226)	c	227)	a	228)	a
65)	a	66)	d	67)	d	68)	c	229)	a	230)	c	231)	d	232)	b
69)	c	70)	b	71)	a	72)	b	233)	a	234)	d	235)	a	236)	a
73)	a	74)	b	75)	c	76)	d	237)	b	238)	b	239)	b	240)	b
77)	b	78)	c	79)	a	80)	a	241)	c	242)	d	243)	d	244)	a
81)	c	82)	b	83)	d	84)	d	245)	d	246)	c	247)	d	248)	b
85)	d	86)	b	87)	c	88)	a	249)	c	250)	b	251)	b	252)	b
89)	c	90)	a	91)	d	92)	a	253)	d	254)	a	255)	b	256)	b
93)	c	94)	c	95)	a	96)	a	257)	a	258)	a	259)	d	260)	a
97)	d	98)	a	99)	b	100)	d	261)	c	262)	a	263)	d	264)	b
101)	a	102)	a	103)	c	104)	d	265)	c	266)	d	267)	c	268)	c
105)	a	106)	d	107)	a	108)	c	269)	a	270)	c	271)	d	272)	c
109)	a	110)	a	111)	a	112)	c	273)	b	274)	d	275)	a	276)	c
113)	b	114)	a	115)	c	116)	a	277)	c	278)	d	279)	d	280)	b
117)	a	118)	d	119)	b	120)	c	281)	b	282)	d	283)	d	284)	c
121)	b	122)	a	123)	d	124)	b	285)	c	286)	c	287)	b	288)	a
125)	d	126)	b	127)	d	128)	a	289)	a	290)	c	291)	b	292)	a
129)	a	130)	a	131)	c	132)	b	293)	b	294)	c	295)	b	296)	a
133)	b	134)	d	135)	a	136)	d	297)	a	298)	b	299)	d	300)	c
137)	d	138)	b	139)	a	140)	d	301)	a	302)	b	303)	a	304)	c
141)	a	142)	c	143)	a	144)	a	305)	a	306)	a	307)	d	308)	b
145)	b	146)	d	147)	b	148)	d	309)	a	310)	a	311)	c	312)	a
149)	d	150)	d	151)	d	152)	a	313)	b	314)	b	315)	b	316)	a
153)	c	154)	a	155)	d	156)	c	317)	a	318)	d	319)	d	320)	c
157)	c	158)	a	159)	a	160)	d	321)	d	322)	a	323)	d	324)	c
161)	b	162)	b	163)	b	164)	a	325)	b	326)	d	327)	a	328)	b

329)	b	330)	a	331)	d	332)	d	397)	c	398)	c	399)	b	400)	d
333)	a	334)	c	335)	b	336)	c	401)	b	402)	a	403)	b	404)	b
337)	b	338)	b	339)	d	340)	d	405)	b	406)	a	407)	d	408)	d
341)	c	342)	b	343)	d	344)	b	409)	b	410)	b	411)	d	412)	d
345)	c	346)	d	347)	c	348)	b	413)	d	414)	a	415)	b	416)	a
349)	d	350)	d	351)	c	352)	b	417)	c	418)	b	419)	a	420)	d
353)	a	354)	a	355)	b	356)	b	421)	b	422)	a	423)	a	424)	a
357)	d	358)	c	359)	d	360)	c	425)	b	426)	c	427)	c	428)	b
361)	a	362)	a	363)	c	364)	d	429)	c	430)	b	431)	b	432)	b
365)	b	366)	b	367)	c	368)	a	433)	b	434)	b	435)	c	436)	b
369)	d	370)	a	371)	a	372)	d	437)	b	438)	a	439)	d	440)	c
373)	c	374)	a	375)	c	376)	d	441)	a	442)	a	443)	d	444)	b
377)	a	378)	a	379)	a	380)	a	445)	d	446)	b	447)	c	448)	a
381)	a	382)	c	383)	b	384)	a	449)	d	450)	c	451)	d	452)	b
385)	d	386)	c	387)	b	388)	c	453)	a	454)	a	455)	a	456)	c
389)	c	390)	c	391)	d	392)	a	457)	b	458)	b				
393)	d	394)	c	395)	c	396)	c								

NEURAL CONTROL AND COORDINATION

: HINTS AND SOLUTIONS :

1 **(b)**
The intraocular pressure is about 10-15 mm Hg (~α kPa). The pupils constrict when the eye focuses on a near object. The aqueous humour is secreted by the ciliary bodies and differs in composition from the plasma.

2 **(d)**
Organ of Corti present in cochlea of internal ear, transduce the sound and the information is then passed onto the brain through eighth cranial nerve.

3 **(d)**
Sympathetic nervous system (SNS) is the autonomous nervous system with adrenergic nerve fibres, which release 'adrenaline'. It increases the functioning of visceral organs. It increases heart beat, respiration, dilates the pupil, rises blood pressure, etc.
It controls the secretion of adrenaline by adrenal medulla, functions as emergency hormone. It induces **fight, flight** and **fright reactions.**
Watching a horror movie or under stress conditions, sympathetic nervous system is activated secreting adrenaline. It causes high heart beat, high respiration and inhibits the salivation and secretion from digestive glands making mouth dry.

4 **(b)**
When a nerve stimulus reaches the end of one neuron, acetycholine, a neurotransmitter is released from the synptic vesicles of the neuron. This neurotransmitter helps in conducting the nerve stimulus to the adjacent neuron.

5 **(c)**
The reflex pathway comprises at least one afferent neuron, *i.e.,* receptor and one efferent (effector or excitor) neuron appropriately arranged in a series

6 **(d)**
The plasma membrane of neuron is polarized due to difference in the concentration of positive ions across it. This difference is actively maintained by Na^+/K^+ pump. When any deflection in this condition happens, it can be easily detected by plasma membrane it and further transmitted to other neurons

7 **(a)**
Velocity=metre per second,
Therefore, time taken=distance÷ velocity

8 **(c)**
Midbrain is located between the thalamus/hypothalamus of the forebrain and pons of the hindbrain. A canal, called the cerebral aqueduct passess through the midbrain. The dorsal portion of the midbrain consists of four round swellings (lobes) called corpora quadrigemina

9 **(d)**
Synaptic cleft.
One nerve fibre is attached to another nerve fibre *via* a junction called synapse. It is not a tight junction. A synapse is formed by the membrane of a presynaptic neuron and postsynaptic neuron, which may or may not is separated by a gap called synaptic cleft, *i.e.,* axon of one neuron end on the dendrite of next neuron

10 **(b)**
Valve of Vieussens joined corpora quadrigemina (four-optic lobes) of mammalian brain with the cerebellum.

11 **(a)**
Neural system is an organ system. So, it must follow the flow of development of organ system in

an organism. In case of lower organism, each kind of organization is simple. So, neural organization must be simple

12 **(a)**
Movement of the nerve impulse across synaptic cleft is primarily a chemical event mediated by neurotransmitters such as acetycholine (Acl.), gamma-amino butyric acid (GABA), nor-epinephrine and serotonin.

13 **(a)**
When a stimulus is applied, sodium potassium pump stop operating. Sodium ions rush inside and potassium ions rush outside. This results in depolarization (action potential). After a period of action potential sodium potassium pump operate (efflux of Na^+ and influxes of K^+) and axon will get resting potential by repolarization.

14 **(b)**
The spinal nerves passes out from vertebrae through intervertebral foramen. There are total 31 pairs of spinal nerves (8 cervial, 12 thoracic, 5 lumbar, 5 sacral and last one coccygeal) in human.

15 **(d)**
Neurons can be excited by the external stimuli. The stimuli creates an impulse that can be transmitted throughout the neuron and from one neuron to another neuron

16 **(a)**
Frontal lobe of brain controls intellutectual ability. **Parietal lobe** contains somesthetic area for general sensation and area of taste and speech. **Temporal lobe** is concerned with hearing and reading. **Occipital lobe contains** visual area for visual sensation.

17 **(a)**
In neurons, the restoration of resting potential is called repolarization. After depolarization, with the increase of sodium ions inside the nerve fibre, the membrane becomes less permeable to Na^+ and more to K^+. the Na^+ channels of axon membrane close and K^+ channels open. Na^+ influx stops and K^+ outflow starts until the original resting state of ionic concentration is achieved. Thus, resting potential is restored, which is called repolarization of the membrane. Until repolarization occurs, neuron cannot conduct another impulse. The time taken for this restoration is called refractory period.

18 **(a)**
The colour of eyes depends upon the presence of colour in iris (coloured membrane), *i.e.,* brown, black, green blue in albinos iris is deficient of pigment and the red colour of eyes is due to **colour of blood** flowing in blood vessels

19 **(c)**
Coordination is the process through, which two or more organs interact and complement the function of one another. The neural system provides an organized network of point to point connections for a quick coordination. But this system is short lived. As the nerve fibres do not innervate all cells of the body and the cellular functions need to be continuously regulated, a special kind of coordination and integration has to be provided. This function is carried out by hormones released by glands of endocrine system

20 **(b)**
There are two types of photoreceptor cells namely, rods and cones. These cells contains the light-sensitive proteins called the photopigments

21 **(a)**
Para-ventricular nucleus of hypothalamus is related to sweat secretion.

22 **(d)**
The ciliary muscles are smooth muscles and are of circular and meridional type. These muscles alter the shape of lens during accommodation. **Suspensory ligaments** are attached to the ciliary body, which in turn are attached to the capsule that surrounds the lens of the eye. Due to the action of the muscles of the ciliary body and suspensory ligament, the focal length of the lens can be changed. Then, the objects can be focussed in different intensity of light from varying distances.

23 **(b)**
The accumulation of protein called amyloid β – peptide in human brain causes Alzheimer's disease.

24 **(d)**

Each neuron is made up of a cell body, an axon and one or many dendrites. These three components of a neuron make it a functional unit for the production of nerve impulse

25 **(c)**
The entire process of response to a peripheral nervous stimulation, that occurs involuntarily, *i.e.,* without conscious efforts or thought and requires involvement of a part of the central nervous system is called a reflex action

26 **(d)**
The adult human eyeball is nearly a spherical structure

27 **(b)**
The sympathetic and parasympathetic nervous system combines to form autonomic neural system

28 **(d)**
Gamma amino butyric acid (GABA) is an inhibitory neurotransmitter in the human brain. It is a derivative of glutamic acid.

29 **(a)**
Abducens (abducent) nerve is a cranial nerve, which originated from the ventral surface of medulla oblongata. It innervates the lateral rectus muscle of eye ball. It is a motor nerve and controls the movement of the eye ball. Hence, if abducens nerve is injured in a man, movement of eye ball will be affected.

30 **(a)**
Neuron or nerve cell is the longest cell and and forms unit of nervous tissue.
Neurons consists of two main parts:
(i)Main body, which has cell organelles like nucleus, cyton.
(ii)Long process, known as axon, which conducts impulse away from the cell body and remains covered by a fatty sheath known as myelin sheath.
Dendrites are processes that arise from the cell body.

31 **(c)**
Somatic nervous system is a type of peripheral nervous system. It relays impulse from the CNS to skeletal muscles

32 **(b)**
Eustachian tube

33 **(c)**
A - CNS (Cranial Nervous System)
B – PNS (Peripheral Nervous System)
C – ANS (Autonomic Neural System)
D – SNS (Sympathetic Nervous System)
E – (Parasympathetic Nervous System)
The human neural system is divided into two parts
(i) **Central Neural System** (CNS) The CNS includes the brain and the spinal cord and is the site of information processing and control. The PNS comprises of all the nerves of the body associated with the CNS (brain and spinal cord)
(ii) **Peripheral Neural System** (PNS) The PNS is divided into two divisions called somatic neural system and autonomic neural system. The somatic neural system relays impulses from the CNS to skeletal muscles, while the autonomic neural system transmits impulses from the CNS to the involuntary organs and smooth muscles of the body. The autonomic neural system is further classified into sympathetic neural system and parasympathetic neural system

34 **(c)**
In the resting nerve fibre, the cytoplasm inside the axon has a high concentration of K^+ and a low concentration of Na^+ in contrast to the fluid outside the axon. Thus, if diffusion occurs then through concentration gradient Na^+ enters the fibre.

35 **(a)**
Central canal is a part of spinal cord.

36 **(a)**
I – True, II – true, III – false, IV – false.

Neuroglial cells are the packing and supporting cells found in brain and spinal cord. They are of three types, *i.e.,* astrocytes, oligodendrocytes and microglia

Astrocytes are responsible for separation of two neurons by insulation. Oligodendrocytes are a category of glial cells that form myelin sheath around the axon

Microglia are phagocytic as well as scavengers. They engulf microbes and cellular debris. Nearly 50% of all brain cells are neuroglia

Schwann cells are the neuroglial cell, which are present in PNS

37 **(c)**
The neural system provides an organized network of point to point connection for a quick coordination

38 **(a)**
The myelin sheath of myelinated nerve fibres prevents flow of ions between extracellular fluid and axoplasm. Exchange of ions can occur only at the nodes of Ranvier. Therefore, action potential jumps from node to node and passes along myelinated axon faster than the series of smaller local currents in a non-myelinated axon. This is called **saltatory conduction**.

39 **(a)**
Lysozyme is a protein with low molecular weight found in phagocytic cells and most of the tissue fluids. The fluids like sweat, urine, cerebrospinal fluid do not contain them. They have mucolytic property due to which they act on glycopeptide cell walls of certain microorganisms and cause their lysis.

40 **(a)**
The process through which two or more organs interact and complement the function of one another is called coordination. In case of physical work/exercise muscles, lungs, heart, brain and kidney work together to provide maximum resources to the body to fulfill its demand

41 **(c)**
Somatic sensory neurons occur in peripheral nerves in the skin, skeletal muscle, joints and bones. These transmit the sensory information to the sensory nervous system.

42 **(c)**
Yellow spot or macula lutea is a region in retina of eye and contain only cone cells filled with yellow pigment. Below this lies fovea centralis, which is most sensitive part of eye.

43 **(c)**
The middle ear contains three ossicles called malleus, incus and stapes, which are attached to one another in a chain-like fashion. The malleus is attached to the tympanic membrane and the stapes is attached to the oval window of the cochlea. The ear ossicles increase the efficiency of transmission of sound waves to the inner ear. An **Eustachian tube** connects the middle ear cavity with the pharynx. The Eustachian tube helps in equalizing the pressures on either sides of the eardrum

44 **(d)**
Neural system is made up from neurons and is responsible for transmission of the nerve impulse, from pre-synaptic nerve to post-synaptic nerve and physiology of reflex action

45 **(c)**
The **thalamus** is the main principal relay station for sensory impulses that reach the cerebral cortex from spinal cord, brain stem, and cerebellum. Certain nuclei in the thalamus relay all sensory inputs to cerebral cortex. These include medical geniculate nucleus for hearing lateral geniculate nucleus for vision, ventral posterior nucleus for sense and anterior nucleus concerns with emotions and conversion of memory.

46 **(a)**
During the transmission of nerve impulse through a nerve fibre, the potential on the inner side of the plasma membrane has first negative charge, then positive and again negative by repolarisation.

47 **(b)**
Preganglionic nerve fibres of III (oculomotor), VII (facial), IX (glossopharyngeal) and X (vagus) cranial nerves are a part of parasympathetic nervous system. V, VII, IX and X cranial nerves are mixed nerves.

48 **(a)**
There are two types of photoreceptor cells, *i.e.,* (i) Rods (ii) Cones
These cells contains the light-sensitive proteins called the photopigments. The daylight (photopic) vision and colour vision are the functions of cones and the twilight (scotopic) vision is the function of the rods. The rods contains a purplish-red protein called the rhodopsin or visual purple, which contains a derivative of vitamin-A. In human eye, there are three types of cones which possess their own characteristic photopigments that respond to red, green and blue lights. The

sensations of different colours are produced by various combinations of these cones and their photopigments. When these cones are stimulated equally, a sensation of white light is produced

49 **(b)**
Sweating (maintenance of body temperature) is not a reflex action. It is regulated by automatic nervous system.

50 **(c)**
Neurosynaptic junction.
A-Dendrites, B-Cell body, C-Axon, D-Nodes of Ranvier, E-Synaptic knob. A neuron is a microscope structure composed of three major parts, *i.e.,* cell body, dendrites and axon. The cell body contains cytoplasm with typical cell organelles and certain granular bodies called **Nissl's gransules**
Short fibres which branch repeatedly and project out of the cell body also contain Nissl's granules and are called dendrites. These fibres transmit impulses towards the cell body. The axon is a long fibres, the distal end of which is branched.
Each branch terminates as a bulb-like structure called synaptic knob which possess synaptic vesicles containing chemicals called neurotransmitters. The axons transmit nerve impulses away from the cell body to a synapse or to a neuro-muscular junction

51 **(c)**
From CNS to the concerned peripheral tissues/organs.
The nerve fibres of the PNS are of two types namely afferent fibres and efferent fibres

52 **(b)**
Two types of brain cells are-the neuron and neuroglia. Neurons are functional typical nerve cells, which generate and conduct impulses. Due to high degree of specialization, the neuron loss their ability to divide. The neuroglia have ability of division.

53 **(d)**
Autonomic nervous system, a type of peripheral nervous system transmits impulses from the CNS to the involuntary organs and smooth muscles of the body

54 **(c)**
II → I → IV → III

55 **(d)**
All of the above.
The nervous system is composed of neurons (nerve cells), which exercise control by sending electrical signals called nerve impulse. The nervous control is speedy and flexible but its effect is localized. A neuron may transmit impulse as fast as 150 impulse

56 **(d)**
There are ten laminae in the grey matter of spinal matter.

57 **(a)**
Ten pairs of cranial nerves are present in an anaminotes such as fishes and amphibians like **twelve pairs** of cranial nerves are present in amniotes, like reptiles, birds and mammals including rabbit and humans.

58 **(b)**
A – **Duramater** It is the outer meninx. It is thick, tough and lines the cranial cavity
B – **Arachnoid membrane** It is the middle meninx. It is thin but is non-vascular
C – **Piamater** It is the inner meninx. It is very thin, highly vascular and closely innervates the brain

59 **(b)**
Reflex action is the involuntary functioning or movement of any organ or part of the body to a stimulus.
The reflex action is an automatic motor response to a sensory stimulus without brain being immediately involved.

60 **(a)**
Vitreous chamber is the space between the lens and the retina. The vitreous humour is the transparent, colourless, gelatinous mass that fills

61 **(c)**
Organ of Corti is present on the basilar membrane as a sensory ridge in cochlear part of internal ear. It is formed of receptor cells, Deiteir's cells and supporting cells.

62 **(b)**
During repolarization, Na^+ channels are closed. Actually, it occurs due to depolarization, so that no more Na^+ ions can enter the cell. After about 0.5 ms, permeability to K^+ ion increases because the build up of positive charge inside the cell opens voltage-gated K^+ channels.

63 **(b)**

White matter is white in colour and is mostly formed of medullated nerve fibres

64 **(b)**
Efferent neuron.
The reflex pathway comprises at least one afferent neuron, *i.e.,* receptor and one efferent (effector or excitor) neuron appropriately arranged in a series

65 **(a)**
Brain and spinal cord combinely form the CNS. CNS lies along the main axis of the body, it consists of the upper large brain or encephalon situated in the head and the lower long, narrow spinal cord located in the neck and trunk. CNS is the site of information process and control

66 **(d)**
Nerve cells are the part of nervous system.

67 **(d)**
Vertebral column protects spinal cord.

68 **(c)**
In **myopia** or **short-sightedness** (near object is clear, far object is not clear), eye ball becomes longer and image is formed before retina. This defect of eye can be corrected by using spectacles with concave lenses.

69 **(c)**
On the basis of nature of nerve fibres, the nerves are of three types
(i) **Sensory** (Afferent) **Nerves** These contains only sensory nerve fibres
(ii) **Motor** (Efferent) **Nerves** These contains only motor nerve fibres
(iii) **Mixed nerves** These contains both sensory and motor nerve fibres

70 **(b)**
Nervous system is mediated by ions, across the plasma membrane of neurons. It is the fastest mechanism of communication in the body and its average rate is 15 m/s, while endocrine system may take minute, hours and even days or months

71 **(a)**
Meninges are the connective tissue membranes which protect the central nervous system and projections of its structure. These are of three types-piamater, arachnoid and duramater. In brain, **duramater** is outermost layer, **arachnoid** is the middle and **piamater** is innermost layer.

72 **(b)**

Organs	Sympathetic Nervous System	Parasympathetic Nervous System
Gastric glands	Inhibits secretion of gastric juice	Stimulates secretion of gastric juice
Intestinal glands	Decreases secretion of intestinal juice	Promotes secretion of intestinal juice
Pancreas	Inhibits secretion of pancreatic juice	Stimulates secretion of pancreatic juice
Salivary glands	Inhibits secretion of saliva	Stimulates secretion of saliva

73 **(a)**
The cutaneous plexus and the papillary plexus consist of a network of nerves to provide dermal sensation.

74 **(b)**
The velocity of conduction of action potential propogation is fastest in large diameter myelinated axons than in unmyelinated axons. In myelinated fibres,, conduction velocity is directly proportional to the thickness of the myelin sheath.

75 **(c)**
The main parts of diencephalon are epithalamus, thalamus and hypothalamus. Epithalamus is thin non nervous part. Its anterior part is vascular and folded to form the anterior choroid plexus. Just behind the anterior choroid plexus the epithelium forms a short stalk, the pineal stalk which has a rounded pineal body.

76 **(d)**
Retina of eye is analogous to film of a camera.

77 **(b)**
Cerebellum consists of two lateral cerebellar hemispheres. A cross section of cerebellar hemisphere shows a branching tree-like arrangement of grey and white matter called

the **arbor vitae**. It is the second largest part of brain. It helps control body posture, maintenance of muscle tone, coordinate voluntary muscular activties and equilibrium of body.

78 **(c)**
The knee-jerk reflex is an example of spinal reflex, which involves only control of spinal cord. Brain is not involved in this process

79 **(a)**
Energy from ATP cause confirmational change in the solute carrier complex. From energy of one ATP, three Na^+ pumped outside and two K^+ ions taken in. this process of expelling out Na^+ ions and drawing in K^+ ions against the concentration gradient and electrochemical gradient is called **sodium-potassium exchange pump** of the cell.

80 **(a)**
Synaptic knob is bulb like structure present at the end of axon terminal

81 **(c)**
Autonomic nervous system controls and coordinates the involuntary activities of various **internal organs**. This system is divisible into two parts:
1.Sympathetic nervous system

2.Parasympathetic nervous system

82 **(b)**
The process of expelling out sodium ions and drawing in potassium ions against concentration and electrochemical gradients is termed as sodium potassium pump. It occurs normally to maintain the normal difference in the ionic concentrations and electric potential between the outside and inside of the plasma membrane, *i.e.,* the steady state of a resting nerve fibre

83 **(d)**
The PNS comprises of all the nerves (cranial nerves and spinal nerves) of the body associated with the CNS (brain and spinal cord)

84 **(d)**
The hindbrain comprises **pons, cerebellum** and **medulla** also called the medulla oblongata. Pons consists of fibre tracts that interconnect different regions of the brain. Cerebellum has very convoluted surface in order to provide the additional space for many more neurons. The medulla of the brain is connected to the spinal cord. The medulla contains centres which control respiration, cardiovascular reflexes and gastric secretions

85 **(d)**
Medulla oblongata is the centre for heart beats, respiration, blood pressure, etc.

86 **(b)**
Endocrine system provides chemical coordination *via* hormones

87 **(c)**
When a neuron is not conducting any impulse, *i.e.,* resting, the axonal membrane is comparatively more permeable to potassium ions (K^+) and nearly impermeable to sodium ions (Na^+). Similarly, the membrane is impermeable to negatively charged proteins present in the axoplasm. Consequently, the axoplasm inside the axon contains high concentration of K^+ and negatively charged proteins and low concentration of Na^+. In contrast, the fluid outside the axon contains a low concentration of K^+, a high concentration of Na^+ and thus form a concentration gradient

88 **(a)**
One ATP is used to transfer $3Na^+$ outside and $2K^+$ inside by Na^+ pump, *i.e.,* active transport of ions

89 **(c)**
12 pairs.
There are two types of photoreceptor cells namely (i) Rods and (ii) Cones
These cells contains the light-sensitive proteins called the photopigments. The daylight (photopic) vision and colour vision are the functions of cones and the twilight (scotopic) vision is the function of the rods. The rods contains a purplish-red protein called the rhodopsin or visual purple, which contains a derivative of Vitamin-A. In human eye, there are three types of cones which possess their own characteristic photopigments that respond to red, green and blue lights
The sensations of different colours are produced by various combinations of these cones and their photopigments. When these cones are stimulated equally, a sensation of white light is produced

90 **(a)**
Alcoholism mainly affects the cerebellum region of brain resulting in clumsy gait,

boisterous (noisely cheerful), loss of motor coordination, so that driving ability is impaired.

91 **(d)**
Ependymal cells, are ciliated cells found in the central nervous system in the form of epithelium that lines the **cavities of CNS**

92 **(a)**
Blind spot is a region at the back of eye where the optic nerve exists the eye on its way to the brain. At this spot no image is formed due to absence of photoreceptor cells- rods and cones.

93 **(c)**
The cerebral cortex contains motor areas, sensory areas and large regions that are neither clearly sensory motor in function. These regions are called as the association areas. These are responsible for complex functions like intersensory associations, memory and communication

94 **(c)**
Study of the structure, functions and diseases of the nervous system is called neurology. Neurology is derived from Greek work *neuron* – nerve; *logos* – study

95 **(a)**
RAS it is a diffuse network of nerve cell bodies and nerve tracts that extends through the brain stem. It screens sensory information so that only certain only certain impulses reaches the cerebrum. It is also important in overall activation and arousal. When certain neurons in RAS are active, we are awake, when they are inhibited by other neurons we sleep

96 **(a)**
Hindbrain includes three parts, *i. e.*, cerebellum, pons Varolii and medulla oblongata. **Thalamus** is present in forebrain.

97 **(d)**
I, II and III.
Choroid infront from ciliary body, which is thick round and referred. It is hidden by iris (coloured membrane)

98 **(a)**
Supply of glucose normally stored as glycogen in the neurons, *i. e.*, brains also depends on blood for glucose supply.

99 **(b)**
Nerve impulse is a wave of depolarization of the membrane of nerve cell. The nerve impulse travel along a neuron or across a synapse. In the axon of motor nerve fibre the nerve impulse travels away from the cell body.

100 **(d)**
Retina is formed of four layer of cells.
(i)Pigmented epithelium - having melanin pigment granules in cytoplasm.
(ii)Layer of photoreceptors - rods and cones.
(iii)A layer of bipolar neurons - Act as both sensory and conducting neurons.
(iv)Retinal ganglion cells - axons form the optic nerve

101 **(a)**
Synaptic vesicle, containings neurotransmitter, is found in pre-synaptic neuron.

102 **(a)**
Skin blood vessels constrict and skeletal muscles contract due to cold is an example of negative feedback mechanism of homeostasis.

103 **(c)**
The brain can be divided into three major parts
(i) Forebrain (ii) Midbrain (iii) Hindbrain
i.e., prosencephalon, mesencephalon and rhombencephalon

104 **(d)**
Heart, muscle and renal cortex use acetoacetate in preference to glucose. In contrast, glucose is the major fuel for the brain in well nourished persons on a balanced diet. However, the brain adapts to the utilization of acetoacetate during starvation, pregnancy and diabetes.

105 **(a)**
Coiled portion of the labyrinth is called cochlea

106 **(d)**
Pneumotaxic centre is a respiratory centre.
Pons Varolii is situated in front of the cerebellum below the midbrain and above the medulla oblongata. It relays impulses between the medulla oblongata and more superior part of the brain, between the hemispheres of the cerebellum and between

the cerebrum and cerebellum. It contains centre that work with those in the medulla to regulate breathing.

107 **(a)**
Sympathetic nervous system increases the rate and force of heart beat, constricts most blood vessels, raises the arterial blood pressure, dilates the pupil, slows down peristaltic movements and relax the urinary bladder.

108 **(c)**
A nerve impulse is transmitted from one neuron to another through junctions called synapses. A synapse is formed by the membranes of a presynaptic neuron and a postsynaptic neuron, which may or may not be separated by a gap called synaptic cleft
There are two types of synapses, *i.e.,* electrical synapses and chemical synapses. At electrical synapses, the membrane of pre- and postsynaptic neurons are in very close proximity. Electrical current can flow directly from one neuron into the other across these synapses
Transmission of an impulse across electrical synapses is very similar to impulse conduction along a single axon. Impulse transmission across an electrical synapse is always faster than the across a chemical synapse. Electrical synapses are rare in our system
At a chemical synapse, the membranes of the pre- and postsynaptic neurons are separated by fluid-filled space called synaptic cleft. Chemicals called neurotransmitters are involved in the transmission of impulses at these synapses

109 **(a)**
Main cell body of neuron is called as cyton or soma. It contains large and centrally located nucleus, mitochondria, Golgi bodies, rough endoplasmic reticulum, lysosomes, fat globules. Besides, these soma also contains Nissl's granules or neurofibrils. These are masses of ribosomes and rough endoplasmic reticulum and are engaged in the process of protein synthesis.

110 **(a)**
CNS is the site of information processing and control.
The human neural system comprises of PNS and CNS both. PNS consists of all the nerves (cranial nerves and spinal nerves) associated with CNS. CNS is the site of information processing and control

111 **(a)**
Vagus nerve is a mixed cranial nerve, controlling much of the gut, ventilatory system and heart. It does not affect tongue movements. Tongue movement is controlled by glossopharyngeal nerve.

112 **(c)**
The human neural system comprises of PNS and CNS both. PNS consists of all the nerves (cranial nerves and spinal nerves) associated with CNS. CNS is the site of information processing and control

113 **(b)**
Association areas the neither sensory nor motor in function and are found in the cerebral cortex

114 **(a)**
A neuron is a microscopic structure

115 **(c)**
Both (a) and (b), *i.e.,* cones and rods

116 **(a)**
Parkinsonism is characterized by tremors and progressive rigidity of limbs caused by degeneration of brain neurons and a neurotramsitter called dopamine.

117 **(a)**
Lens is colourless, transparent and fibrous crystalline structure made up of protein α and β – crystalline protein enclosed in lens membrane.

118 **(d)**
Peristalsis of the intestine is an example of autonomous nervous system.

119 **(b)**
Nervous tissue forms the nervous system in animals. It is ectodermal in origin

120 **(c)**
Cerebrum is the largest and most prominent part of the brain and covers all other parts of the brain. The major functions of cerebrum are concerned with conscious sensation, will skilled work, intelligence (including memory, experience learning, thinking, reasoning,

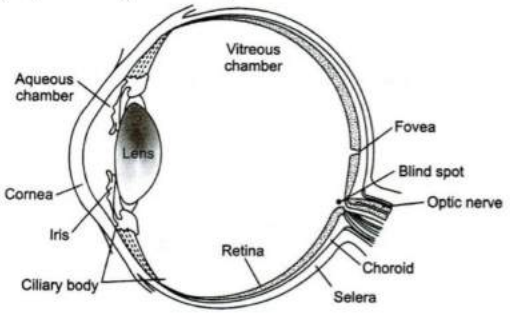
knowledge, speech) and other voluntary activities, etc.

121 **(b)**

Lens.

The choroid layer is thin over the posterior two third of the eyeball. But it becomes thick in the anterior part of form ciliary body. The ciliary body itself continues forward to form a pigmented and opaque structure called the iris which is the visible coloured portion of eye. The eyeball contains a transparent crystalline lens which is held in place by ligaments attached to ciliary body.

In front of the lens, the aperture surrounded by the iris is called the pupil. This diameter of the pupil is regulated by muscle fibres of iris



Internal structure of eye

122 **(a)**

Neuroglia cells re the special connective tissue cell that occur in the central nervous system. These are non-sensory supporting cells and are of four types- oligodendrocytes, astrocytes (both larger, also called macroglia), microglia and epidermal cells.

123 **(d)**

Brain acts as the command and control system and it controls the voluntary movements, balance of the body, functioning of vital involuntary organs (*e. g.*, lungs, heart, kidneys, etc.), thermoregulation, hunger and thrist, circadian (24-hours) rhythms of our body, activities of several endocrine glands and human behavior. It is the site for processing of vision, hearing, speech, memory, intelligence, emotions and thoughts

124 **(b)**

Myelin sheaths in the peripheral nervous system are formed by **Schwann cells**, which indent to receive an axon and then wrap themselves around it in a jelly roll fashion.

125 **(d)**

The forebrain consist of cerebrum, thalamus and hypothalamus. Cerebrumts forms the major part of the brain. It is divided longitudinally into two halves, which are termed as right and left cerebral hemisphere. The cerebrum wraps around a structure which is called thalamus and is a major centre for coordinating sensory and motor signaling. Hypothalamus is a very important part of the brain which lies at the base of the thalamus It contains a number of centres which controls body temperatures, urge for eating and drinking. It also secretes hormones called hypothalamic hormones

126 **(b)**

Pneumotaxic centre which can moderate the functions of the respiratory rhythm centre is present in pons region of the brain. Neural signal from this centre can reduce the duration of inspiration and there by after the respiratory rate

127 **(d)**

The hypothalamus contains a number of centres which control body temperature, urge for eating and drinking. It also contains several groups of neurosecretory cells, which secretes hormones called hypothalamic hormones

128 **(a)**

Hypothalamus is the main coordinating and control centre for autonomic nervous system. Its anterior part is thermoregulatory centre. Hence, hypothalamus is called **thermostate** of the body.

129 **(a)**

Vagus nerve is a mixed cranial nerve controlling much of the gut, ventilatory system and heart. It do not affects tongue movements. Tongue movements are controlled by glossopharyngeal nerve

130 **(a)**

If air conduction and bone conduction showed a similar degree of hearing loss, the subject would have sensorineural hearing loss. The ear is most sensitive to frequencies between 1 kHz and 3 kHz. The endolymph is not an ultrafiltrate of plasma but is rich in potassium and low in sodium.

131 **(c)**

Cortisone is a corticosteroid and formed in the adrenal cortex. It is fatty in nature. It do not work as the neurotransmitter

132 **(b)**
Cones are related with vision in bright light and contain pigment iodopsin. Rods are related with vision in dim light. Rods have pigment rhodopsin.

133 **(b)**
Dreaming occurs during REM sleep.

134 **(d)**
The unmyelinated gaps or constrictions in the axons are called **nodes of Ranvier.**

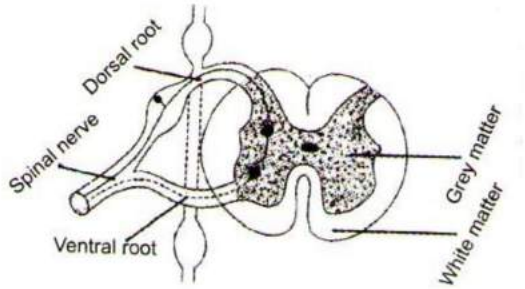
135 **(a)**
Lens and sensory ligament divide the interior of the eyeball into two chambers aqueous and vitreous containing aqueous and vitreous humour respectively.

136 **(d)**
Cerebellum, also called as little brain is very large and well developed, as man performs a wide range of movements. It forms about one-eight of the brain mass.
It is located below the posterior cerebral hemisphere and above the medulla. It is the second largest part of the brain. It maintains posture, equilibrium and muscle tone. It coordinates the voluntary movements initiated by the cerebrum

137 **(d)**
Transmission of nerve impulse through nerve fibre occurs unidirectionally because axon of one neuron linked to the dendrite of another neuron through synapse. Synaptic vesicles are filled with a neurotransmitter (*e.g.*, acetylcholine) released by axon endings not by dendrites.

138 **(b)**
Trochlear nerve is fourth motor cranial nerve. This nerve name means 'pulley' because it innervates an extrinsic eye muscle that loops a pulley-shaped ligaments in the orbit.

139 **(a)**
The given diagram represents a reflex arc and its labelling is as follows:



140 **(d)**
Blood pressure and blood flow through blood vessels are maintained under involuntary sympathetic nervous system (SNS) and parasympathetic nervous system (PNS).

141 **(a)**
Light falls on retina and its amount is regulated by iris

142 **(c)**
The optic nerves leave the eye and the retinal blood vessels enter it at a point medial to and slightly above the posterior pole of the eyeball. Photoreceptor cells are not present in that region and hence it is called **blind spot.** At the posterior pole of the eye, lateral to the blind spot there is a yellowish pigmented spot called macula lutea with a central pit called the **fovea.** The fovea is a thinned-out portion of the retina where only the cones are densely packed. It is the point where the visual acuity (resolution) is the greatest

143 **(a)**
Spinal nerve is mixed nerve, which arises from grey matter of spinal cord. Spinal nerves have two roots. The dorsal root is sensory and the ventral root is motor. If dorsal root of spinal cord is broken down, the pathway of nerve will break so, no impulse will be transmitted.

144 **(a)**
Mechanism of Vision
The light rays passes through cornea, aqueous humour, lens and vitreous humour and focusses on retina where they generate potential (impulses) in rods and cones. The photosensitive compound (photopigments) in the human eyes is composed of **opsin** (a protein) and retinal (an aldehyde of vitamin-A). Light induces dissociation of retinal from opsin which changes the structure of the opsin. Thus, potential differences are generated in the photoreceptor cells.

This causes action potentials in the ganglion cells through the bipolar cells. These action potentials (impulses) are transmitted by the optic nerves to the visual cortex area in the occipital lobe of the cerebral hemisphere of the brain where the neural impulses are analysed and erect image is recognised

145 **(b)**
Rod cells are responsible for night or twilight vision only.
Both (a) and (b), *i.e.,* cones and rods

146 **(d)**
Cornea, lens, iris.
Choroid infront from ciliary body, which is thick round and referred. It is hidden by iris (coloured membrane)

147 **(b)**
Cell-A is the cone cell more concentrated in the fovea centralis, the region of keenest vision. It is located in the centre of the retina, in direct line with the centre of the lens and cornea. The acuity of an animal's eye depends on the density of cones in the fovea. Cell-B is the rod cell found at the peripheral parts of the retina. Rods are high sensitivity receptors for dim light.

148 **(d)**
Medulla oblongata contains centre for the control of heart beat, respiration, digestion, blood pressure, gut peristalsis, swallowing of food, secretion of gland, involuntary function, *i. e.*, vomiting, coughing, vasoconstrictor, vasodilator, sneezing, hiccuping, etc., medulla oblongata is not the centre for temperature regulation, it is controlled by 'hypothalamus'.

149 **(d)**
Maintaining an increased muscular activity.
When we do physical exercise, the energy demand is increased to maintain the increased muscular activity

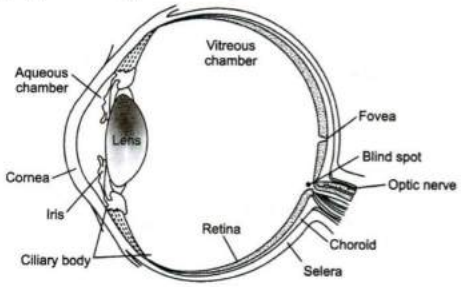
150 **(d)**
Nissl's granules are the granular bodies comprises of irregular masses of ribosomes and ER which take part in protein synthesis

151 **(d)**
Olfactory lobes are solid.

152 **(a)**
Ampullae of Lorenzini, situated in the snout of shark, are thermoreceptors responding to changes in temperature.

153 **(c)**
The brain is the centre of the nervous system in all vertebrates and most invetebrate animals. The neural plate of ectoderm forms the brain, spinal cord and nerves.

154 **(a)**
The choroid layer is thin over the posterior two third of the eyeball. But it becomes thick in the anterior part of form ciliary body. The ciliary body itself continues forward to form a pigmented and opaque structure called the iris which is the visible coloured portion of eye. The eyeball contains a transparent crystalline lens which is held in place by ligaments attached to ciliary body.
In front of the lens, the aperture surrounded by the iris is called the pupil. This diameter of the pupil is regulated by muscle fibres of iris



Internal structure of eye

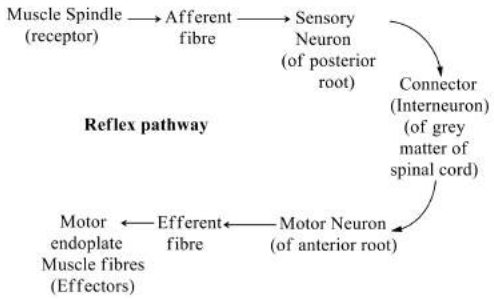
155 **(d)**
Middle layer of eye is choroid, which on anterior side becomes thick from ciliarybody the ciliary body itself continuous forward to form iris. In front of lens the aperture surrounded by the iris is called pupil. In the middle of a normal iris, pupil can be seen.
It is an opening that is circular and is comparable to the aperture of a camera. As the amount of light entering the eye diminishes (such as in a dark room or at night), the iris dilator muscle (which runs radialy through the iris) pulls away from the centre, causing the pupil to 'dilate'.
This allows more light to reach to the retina.
When too much light is entering the eye, the iris sphincter muscle (which enriches the pupil) pulls toward the centre, causes the pupil to constrict, allowing less light to reach the retina

156 **(c)**

Vagus nerve gives many branches (about 13 pair). It is mixed and longest cranial nerve. Vagus nerve innervate muscles of larynx, pharynx, oesophagus, gullet, stomach, heart and lungs.

157 **(c)**

A-Afferent neurons; B-Efferent neurons; C-CNS; D-Effector.



158 **(a)**

The cranial nerve, oculomotor is carrying the nerve fibres originating from the Edinger-Westphal nucleus.

159 **(a)**

When we do physical exercise, the energy demand is increased to maintain the increased muscular activity

160 **(d)**

In human brain, hypothalamus is a centre for hunger, thirst, sweating, sleep, fatigue, temperature, anger, pleasure, love, hate and satisfaction.

161 **(b)**

The correct sequence of organs in the organization of human ear is the following:
Pinna → Auditory canal →
Tympanic membrane → Malleus → Incus → Stapes → Cochlea → Auditory nerve

162 **(b)**

The cerebrum wraps around a structure called thalamus, which is a major coordinating centre for sensory and motor signalling

163 **(b)**

White.
Both (a) and (b), *i.e.,* cones and rods

164 **(a)**

Ultra violet radiation from can cause cataract and skin cancer.

165 **(c)**

Inner part of cerebral hemisphere is called the white matter, due to the fibres of the tracts covered with the myelin sheath.
The cerebral cortex contains motor areas, sensory areas and large regions that are neither clearly sensory motor in function. These regions are called as the association areas. These are responsible for complex functions like intersensory associations, memory and communication

166 **(d)**

The inner ear contains a complex system called vestibular apparatus located above the cochlea. The vestibular apparatus is composed of three semi-circular canals and the otolith organ consisting of the saccule and utricle. Each semicircular canal lies in a different plane at the right angles to each other.
The membranous canal suspended in perilymph of the bony canals. The base of the canals is swallon and is called ampulla, which contains a projecting ridge called crista ampullaris, which contains hair cells. The saccule and utricle contains a projecting ridge called macula. The crista and macula are the specific receptors of the vestibular apparatus which are responsible for maintenance of balance of the body and posture

167 **(c)**

Rod and cone cells are the photoreceptor cells of retina. The rods contain the rhodopsin (visual purple) pigment and enable the animals to see in darkness, therefore, present in large number in nocturnal animals. The cones contain the iodopsin (visual violet) pigment and chiefly concerned with distinction in colour and light vision during day time.

168 **(a)**

Lysozyme is an enzyme that breaks down bacterial cell walls and provides protection against bacterial invasion in the skin, mucous membranes and many body fluids. It is found especially in tears and preventing infection in the eye.

169 **(b)**

I, II, and IV are correct.
Each neuron is made up of a cell body, an axon and one or many dendrites. These three

components of a neuron make it a functional unit for the production of nerve impulse

170 **(d)**
Olfactory nerve fibres arise from olfactory recepter cells located in olfactory epithelium of nasal cavity. Bipolar neurons are found in olfactory epithelium. These neurons have only two processes, an axon at one end and a dendrite at another end.

171 **(a)**
Aqueous chamber → Ciliary body → Iris → Blind spot → Sclera.
Internal ear of human is filled with endolymph

172 **(c)**
Cochlear duct is a bony spiral tunnel within the cochlea of internal ear filled with endolymph.

173 **(a)**
Pneumotaxic centre is present in the pons varolli, which can moderate the functions of respiratory rhythm centre. Neural signals from this centre can reduce the duration of inspiration and thereby, after the respiratory rate

174 **(c)**
The dorsal part of midbrain (mesencephalon) is in the form of two pairs (*ie*., four) of spherical optic lobes (corpora quadrigemina) located behind the pineal body. Optic lobes are reduced merely as reflex centres of visual and auditory sensations.

175 **(a)**
In brain, arbor vitae is made up of grey matter.

176 **(d)**
1.Frontal lobe

2.Temporal lobe

3.Cerebellum

4.Medulla oblongata

5.Parietal lobe

178 **(c)**
Forebrain, also known as prosencephalon forms the greater part of the brain. It consists of three regions-olfactory lobes, cerebral hemisphere (cerebrum) and diencephalon

179 **(c)**
It is a very narrow cavity in the brain. It is of the brain, also known as cerebral aqueduct
It extends though the midbrain. It connects the third and fourth ventricles

180 **(c)**
Retina of eye consists of photoreceptor neurons, *i. e*., rods and cones. Rods contains rhodopsin, which consists of the protein scotopsin and retinene, (a derivative and vitamin-A). Rods are highly sensitive to dim light and are specialized for night, vision.

181 **(c)**
Nociceptors (itch and pain) and thermoreceptors are bare nerve endings. The receptive fields vary across the skin being smallest in the most distal regions (*e. g*., fingertips, lips). Sensory information from the skin reaches the brain *via* several pathways most notably the dorsal column pathway and the spinothalamic tract.

182 **(a)**
Nerve fibres are impermeable due to myclin sheath. But at some places this myelination is not found. During transmission of nerve impulse, the flow of ions is established between these non-myelinated portions
This kind of makes the transmission of impulse very fast, as the impulse do not have to travel all along the axon, it can jump over the axon

183 **(c)**
If an organism has more rods, it will active during night. The rod contains a visual pigment rhodopsin and are adapted for vision in dim light.

184 **(d)**
The cell body contains cytoplasm with typical cell organelles and certain granular bodies called Nissl's granules

185 **(a)**
Synapse is a site of junction between axon of one neuron and dendrites of another neuron. Each neuron receives an impulse through its dendrites and passes it on to the next neuron through synapse.

186 **(c)**
The kind of action potential to be developed on the membrane of postsynaptic neuron depends

upon the action of neurotransmitter. *It is summarized as follows*

(i) Neurotransmitter → Excitatory Receptor → Open channels of Na^+ ions or both for Na^+ and K^+ → Depolarising of plasma membrane of postsynaptic Neuron → Action potential

(ii) Neurotransmitter → Inhibitory Receptor → Opens K^+ or Cl^- channels → Hyperpolarisation of plasma membrane of postsynaptic neuron → No action potential so, the new potential developed may be either excitatory or inhibitory

187 **(d)**

The **sixth cranial nerve** or **abducens nerve** is a motor, proprioceptive nerve. It has a pathway from pons to lateral rectus muscle; from eye muscles eye muscles to pons. It functions for the movement of eye ball and muscle sense.

188 **(c)**

Spinal nerves come out from spinal cord (gray matter). There are 37 pair of spinal nerves in rabbit.

31 pairs of spinal nerves are found in man.

189 **(a)**

Ependymal cells are columnar cells that have ciliated surface. They support the central nervous system and also nutritive in function.

Microglia are minute cell, which are phagocytic pathogens and cellular debris within brain.

Astrocytes form structural support between capillaries and neurons within the CNS and contribute to blood-brain barrier.

Oligodendrocytes form myelin in CNS and guide development of neurons within the CNS.

190 **(d)**

Gamma amino butyric acid (GABA) and **glycine** are inhibitory transmitters. Inhibitory transmitter is one that is released by an inhibitory neuron. It can inhibit at a synapse (a junction gap between axon of one neuron to dendrites of another neuron).

191 **(d)**

Basilar membrane and tectorial membrane are the important membranes found in the middle ear at the region of hair cells. These layer contact with afferent nerve fibres and aids in hearing through hair cells

192 **(d)**

The retina is the neural and sensory layer of the eye ball. A small oval, yellowish area of the retina lying exactly opposite to the centre of cornea and named **macula lutea** or yellow spot which has at its middle a shallow depression, the fovea centralis, which has only cone cells.

193 **(a)**

In mammalian brain, paired foramen of Luschka are present on the lateral wall of metacoel. Foramen of Magendie and foramina of Luschka, three 'holes' permit cerebrospinal fluid to flow out into the subarachnoid space from metacoel.

194 **(a)**

Dendrites transmit impulses towards the cell body

195 **(a)**

Cerebrum consists of centre for thinking and learning.

196 **(a)**

Reflex arc is the arrangement of neurons in the pathway that always passes through central nervous system. The axon of one neuron ends on the dendrites of next neuron. Such a junction is called **synapse**.

Monosynaptic reflex arc has only two neurons, *i. e.*, sensory and motor which forms one synapse.

197 **(d)**

Bipolar neurons are the neurons with one axon and one dendrite. They are found in the retina of eye

198 **(d)**

Action potential occurs due to the movement of Na^+ ions from extracellular fluid to intracellular fluid.

199 **(b)**

Bipolar neurons are the neurons with unidirectional flow of information but with one axon and one Dendron at opposite poles. These occur in the retina of eyes, olfactory epithelium, etc.

200 **(a)**

The autonomous nervous system regulates the secretion of glands whereas the glands do not regulate the nervous system.

201 **(b)**
In frog, ninth pair of cranial nerve is **glossopharyngeal**, while trigeminal is fifth pair and vagus is tenth pair of cranial nerves, Hypoglossal is absent in frogs, it is commonly found in rabbit.

204 **(b)**
The cornea admits and helps to focus light waves as they enter the eye. It is avascular, *i. e.*, has no blood supply, therefore, cornea transplant in human is almost nerve rejected.

205 **(d)**
Glaucoma is an eye defect, in which intra-ocular pressure becomes different in the two chambers causing acute pain leading to damaged retina and hence, blindness.

206 **(c)**
Synaptic knob possess synaptic vesicles containing chemicals called neurotransmitters

207 **(c)**
Association area is present in parietal lobe of cerebral hemisphere. It is involved in interpreting an input, storing input information and initiating a response in the light of similar past experience.

208 **(d)**
Cerebrum of forebrain (central nervous system) is the centre for memory and learning.

209 **(c)**
Our paired eyes are located in the sockets of the skull called orbits. The adult human eyeball is nearly a spherical structure. The wall of the eyeball is composed of three layers

210 **(c)**
All the ventricles of the brain and central canal of spinal cord contains lymph-like extracellular fluid called cerebrospinal fluid (CSF). The total amount of CSF is 80-150 mL. CSF contains urea, lactic acid, Na, K^+, Ca^+ etc.

211 **(a)**
I. A nerve fibre is myelinated or unmyelinated. Myelinated nerve fibres are enveloped with Schwann cells which form a myelin sheath around the axon at one or more times
II. Tracts are the bundles of nerve fibres within the central nervous system
III. Ganglia are the masses of neurons that lie in the peripheral nervous system
IV. Nuclei are the masses of neurons clustered inside the central nervous system

212 **(b)**
All the ventricles of brain and central canal of spinal cord contain lymph-like extracellular fluid called cerebrospinal fluid (CSF). The total amount of CSF present in and around central nervous system is 80-150 mL. CSF contains glucose, proteins, lactic acid, urea, Na^+, K^+, Ca^{2+}, Mg^{2+}, Cl^-, HCO_3^- and some WBCs.

213 **(b)**
The human brain is well protected by the skull. Inside the skull, the brain is covered by **cranial meninges,** consisting of an outer layer called duramater, a very thin middle layer called arachnoid and an inner layer called piamater

214 **(b)**
The rod cells contains a purplish-red protein called the rhodopsin or visual purple, which contains a derivative of vitamin-A

215 **(d)**
The **choroid** lies adjacent to the sclera and contains numerous blood vessels that supply nutrients and oxygen to the other tissues especially of retina. It also contains pigmented cells that absorb light and prevent it from being reflected within the eye ball.

216 **(c)**
Dopamine is a neurotransmitter used to cause Parkinson's disease.

217 **(c)**
The aqueous humour is a transparent, gelatinous fluid similar to plasma, but containing low-protein concentration. It is secreted from the ciliary epithelium, a structure supporting the lens. It is located in the anterior and posterior chamber of the eye, the space between the lens and the cornea

218 **(d)**

Anatomically, the ear can be divided into three major sections called the outer ear, the middle ear and the inner ear.
The outer ear consists of pinna and external auditory meatus (canal)

219 **(a)**
Conditioned reflexes are acquired reflexes that is under the control of stimulus. The common examples are, sudden withdrawl of hands or feet, with a jerk, from sudden contact with hot or cold or sharp object, etc.

220 **(c)**
Brain controls the functions of our body organs and provides the qualities of mind like-learning, reasoning and memory.
For such activities, brain needs a large and constant energy supply. Brain account for 20% of the body's consumption of O_2 and 5% of its consumption of blood glucose. Brain deprived of O_2 for just 5 minutes is permanently damaged. Mental confusion results if it is deprived of glucose

221 **(a)**
In a resting nerve fibre, sodium ions predominates in the extracellular fluid, whereas potassium ions predominates in the intracellular fluid. The plasma membrane is electrically positive outside and negative inside. This difference is called potential difference. In neurons, the average resting membrane potential value is -70 mV. During depolarisation, the potential inside the membrane change from -70 mV to +30 mV. Resting potential is generally between -70 mV to -90 mV.

222 **(c)**
Iris.
Choroid infront from ciliary body, which is thick round and referred. It is hidden by iris (coloured membrane)

223 **(b)**
Point 'C' in the figure represents the stage where all Na^+ channels are reactivated but closed and all K^+ channels are closed.

224 **(b)**
Cornea.
Human eye ball is enveloped by three layers, *i.e.,* sclerotic layer, choroid layer and retinal layer outermost sclerotic layer is white portion of eye which mergas with transparent round window called cornea in center. Middle choroid layer lie close to retina and contain light absorbing pigments. In front it form celeary body, which is hidden by iris. Retinal, the innermost thin transparent appear purplish due to presence of eye pigment-rhodopsin

225 **(c)**
Middle meninx is arachnoid membrane.

226 **(c)**
Schwann cells are associated with nervous tissue.

227 **(a)**
Reflexes are classified as the spinal reflexes and the cranial reflexes. The former are so called because their basic neural path leads through spinal nerves and spinal cord. Reflexes at the spinal level have the purpose of removing the animal from harmful stimuli.

228 **(a)**
Skin outside and with mucus membrane inside.
The pinna collects the vibrations in the air, which produce sound. The external auditory meatus leads inwards and extends upto the tympanic membrane (the ear drum). There are very fine hairs and wax secreting sebaceous glands in the skin of pinna and meatus. The tympanic membrane is composed of connective tissues covered with skin outside and with mucus membrane inside

229 **(a)**
Optic nerve leave the eye and retinal blood vessel enter it.
The optic nerves leave the eye and the retinal blood vessels enter it at a point medial to and slightly above the posterior pole of the eyeball. Photoreceptor cells are not present in that region and hence it is called **blind spot.** At the posterior pole of the eye, lateral to the blind spot there is a yellowish pigmented spot called macula lutea with a central pit called the **fovea.** The fovea is a thinned-out portion of the retina where only the cones are densely packed. It is the point where the visual acuity (resolution) is the greatest

230 **(c)**
The wax gland present in the ear canal is called ceruminous gland. The ceruminous gland is present in the skin of pinna and meatus.

Ceruminous gland secretes a brownish, semisolid, fatty substance which lubricates and protect the lining of meatus

231 **(d)**
Yellow spot or macula lutea is found in eye of rabbit and other mammels but not in frog.

232 **(b)**
To increases the efficiency of transmission of sound waves to the inner ear.
The middle ear contains three ossicles called malleus, incus and stapes, which are attached to one another in a chain-like fashion. The malleus is attached to the tympanic membrane and the stapes is attached to the oval window of the cochlea. The ear ossicles increase the efficiency of transmission of sound waves to the inner ear. An **Eustachian tube** connects the middle ear cavity with the pharynx. The Eustachian tube helps in equalizing the pressures on either sides of the eardrum

233 **(a)**
A-Dendrites, B-Cell body, C-Axon, D-Nodes of Ranvier, E-Synaptic knob. A neuron is a microscope structure composed of three major parts, *i.e.,* cell body, dendrites and axon. The cell body contains cytoplasm with typical cell organelles and certain granular bodies called **Nissl's gransules**
Short fibres which branch repeatedly and project out of the cell body also contain Nissl's granules and are called dendrites. These fibres transmit impulses towards the cell body. The axon is a long fibres, the distal end of which is branched.
Each branch terminates as a bulb-like structure called synaptic knob which possess synaptic vesicles containing chemicals called neurotransmitters. The axons transmit nerve impulses away from the cell body to a synapse or to a neuro-muscular junction

234 **(d)**
The external layer of eyeball is composed of dense connective tissue. This dense connective tissue layer is called sclera, which is protective in nature

235 **(a)**
Hypothalamus is the part of the sides and floor of the brain derived from the forebrain. It lies at the base of thalamus. The hypothalamus contains a number of centres, which control body temperature, urge for eating and drinking. It also contains several groups of neurosecretory cells, which secrete hormones called, hypothalamic hormones.

236 **(a)**
Involuntary activities of the body are controlled by autonomic nervous system

237 **(b)**
Diencephalon encloses the cavity called diocoel or third ventricle.

238 **(b)**
Hyperopia (hypermetropia) is corrected with a converging lens. It relaxes when the eye focuses on a distant object. The main refractive element of the eye is the cornea, the lens is the focusing element. When the eye is focused on a near object the ciliary muscle contracts.

239 **(b)**
Hypothalamus is the main coordinating and control centre for autonomic nervous system. It is centre of thermoregulation, appetite, thirst, hunger and satisfaction.

241 **(c)**
A -Nodes of Ranvier, B-Neurolemma, C-Schow an cell.
There are two types of axons, *i.e.,* myelinated and non-myelinated. The myelinated nerve fibres are enveloped with Schwann cells which form a myelin sheath around the axon. The gaps between two adjacent myelin sheath are called modes of Ranvier

242 **(d)**
The inner ear consists of a labyrinth of channels within a skull bone (the temporal bone). The part of the inner ear involved in hearing is cochlea. The cochlea has two large chambers, an upper vestibular canal and a lower tympanic canal, separated by a smaller cochlear duct. The vestibular and tympanic canals filled with perilymph, while cochlear duct is filled with endolymph.

243 **(d)**
A small oval, yellowish area of the retina lying exactly opposite to the centre of the cornea is named the macula lutea or yellow spot which as its middle has a shallow depression, the fovea-centralis. The fovea centralis has cone cells only. It is devoid of rods and blood cells

244 **(a)**
The electrical potential difference across the resting plasma membrane is called as the resting potential.

245 **(d)**
CNS lies along the main longitudinal axis of the body. The CNS consists of two parts, brain and spinal cord. It is the site of information processing and control.
PNS comprises of all the nerves (cranial nerves and spinal nerves) of the body associated with the CNS. The nerve fibres of the PNS are two types, *i.e.,* afferent and efferent fibres

246 **(c)**
Parietal lobe of brain has taste area.

247 **(d)**
All of the above.
The cerebral cortex contains motor areas, sensory areas and large regions that are neither clearly sensory motor in function. These regions are called as the association areas. These are responsible for complex functions like intersensory associations, memory and communication

248 **(b)**
Presence of Nissl's granules (bodies of large and irregular masses of ribosomes and RER) is a characteristic feature of neurons.

249 **(c)**
There are two types of photoreceptor cells of retina, namely rods and cones. The rods contain a purplish red protein called the **rhodopsin** or visual purple, which contains a derivative of vitamin-A.

250 **(b)**
Homeostasis is the property of a system that regulates its internal environment and tends to maintain a stable, relatively constant condition of properties such as temperature or pH. It can be either an open or closed system

251 **(b)**
Corpus callosum is a neural connection between two cerebral hemispheres of mammals.

252 **(b)**
Multipolar neurons are the neurons with one axon and two or more dendrites. These are found in the cerebral cortex

253 **(d)**
The system, which is responsible for providing an organized network of point to point connection for a quick coordination is called neural system. This system is made up of highly specialized cells called neurons, which detects the stimuli throughout the body and transmit it to the brain

254 **(a)**
The myelinated nerve fibres are enveloped with Schwann cells, which form a myelin sheath around the axon

255 **(b)**
The black pigment present in retina is Retinal Pigment Epithelium (RPE),that nourishes retinal visual cells and shields the retina from excess incoming light. The RPE, is composed of a single layer of hexagonal cells that are densely packed with pigment granules

256 **(b)**
Cranial nerves are not part of central nervous system. Cranial nerves are the part of voluntary nervous system and arise from the brain.

257 **(a)**
Sympathetic nervous system dilates the pupils, therefore, permitting more light to enter into the eyes. Sympathetic nervous system includes a chain of sympathetic ganglia.

258 **(a)**
The myelin sheath appears as a tube around the axon of nerve fibre. At regular intervals, the neurilemma is constricted and the myelin sheath is interrupted forming the so, called **nodes of Ranvier**.

259 **(d)**
The upper or superior surface of the 'midbrain' has two pairs of rounded protrusions collectively called the **corpora quadrigemina**; one pair is called superior colliculi and the other pair is called inferior colliculi.

260 **(a)**
A-Sense organ B-Sensory nerve
C-Dorsal horn D-Interneuron
E-Ventral horn F-Motor nerve
GvEffector

261 **(c)**

The gaps present two adjacent myelin sheaths are called nodes of Ranvier

262 **(a)**
Sympathetic nerve accelerates heart beat due to adrenaline. Adrenaline or epinephrine is a hormone secreted by the medulla of the adrenal gland. It presents the body for emergency action. It increases strength and rate of heart beat.

263 **(d)**
Neurotransmitters are the chemicals secreted by axon terminals for transmitting impulse to the next neuron. Acetylcholine, glutamic acid, glycine, GABA, epinephrine all are neurotransmitters. Tyrosine is not a neurotransmitter, it is an amino acid.

264 **(b)**
Oculomotor is a motor nerve, while optic, olfactory and auditory nerve are sensory in function.

265 **(c)**
Axons can be non-myelinated and myelinated both

266 **(d)**
Schwann cells, form a myelin sheath around the axon

267 **(c)**
Cranial nerves originates from brain. These nerves are motor, sensory and mixed types. Abducens is the smallest cranial nerve, it carries stimulus from brain to posterior rectus muscles of eye. So, abducens is a purely motor nerve.
Vagus, facial and trigeminal nerves are mixed cranial nerve, *i. e.*, they are both sensory and motor in function.

268 **(c)**
Diencephalon is a small, unpaired and median squarish part of forebrain. Its dorsal wall called epithalamus and the overlying pia-arachnoid matter are thrown into highly vascular internal folds or tufts invaginated into the diocoel. This dorsal wall is, therefore, called anterior choroid plexus. From the blood capillaries of this plexus some amount of plasma fluid continuously oozes out into the cerebrospinal fluid.

269 **(a)**
All except I.
The inner parts of cerebral hemisphere and a group of associated deep structures like amygdala, hippocampus, etc. form a complex structure called the limbic lobe or limbic system along with hypothalamus. It is involved in the regulation of sexual behavior expression of emotional reactions, (*e. g.*, excitement, pleasure, rage and fear) and motivation

270 **(c)**
Alzheimer's disease in humans is associated with the deficiency of acetylcholine. Alzheimer's disease is an irreversible, progressive disorder, in which brain cells (neurons) deteriorate, resulting in the loss of cognitive functions, primarily memory, judgement and reasoning, movement, coordination and pattern recognition. In advanced stages of the disease, all memory and mental functioning may be lost.

271 **(d)**
II, III and IV.

Neuroglial cells are the packing and supporting cells found in brain and spinal cord. They are of three types, *i.e.,* astrocytes, oligodendrocytes and microglia

Astrocytes are responsible for separation of two neurons by insulation. Oligodendrocytes are a category of glial cells that form myelin sheath around the axon

Microglia are phagocytic as well as scavengers. They engulf microbes and cellular debris. Nearly 50% of all brain cells are neuroglia

Schwann cells are the neuroglial cell, which are present in PNS

272 **(c)**
Both (a) and (b).
Anatomically, the ear can be divided into three major sections called the outer ear, the middle ear and the inner ear.
The outer ear consists of pinna and external auditory meatus (canal)

273 **(b)**

Cornea is anterior, smaller transparent, thicker bulging outward and exposed part of eye. It is non-vascular and refracts the incident light rays to focus on the retina. It is used in eye donation.

274 **(d)**
The motor nerve endings secrete acetycholine, which activates nicotinic receptors of the muscle fibre membrane. Curare inhibits the nicotinic receptors and blocks neuromuscular transmission.

275 **(a)**
Lipofucsin granules are found in nerve cells. Their amount increases with age. These are made up of residual bodies derived from lysosomes.

276 **(c)**
The midbrain is located between the thalamus/hypothalamus of the forebrain and pons of the hindbrain. The hindbrain comprises pons, cerebellum and medulla. Midbrain and hindbrain forms the brain stem

277 **(c)**
Scala media contains the organ of hearing named organ of Corti. Organ of Corti rests on the basilar membrane.

278 **(d)**
In parasympathetic nervous system, acetycholine is released at effector.

279 **(d)**
Steps of Vision Light energy causes change in the shape of rhodopsin, leading to dissociation of retinal from opsin. Structure of opsin changes. Membrane permeability changes. Potential differences are generated in photoreceptor cells. Bipolar cells are depolarized. Ganglion cells are excited. Action potential (impulse) are transmitted by optic nerves in visual cortex. Neural impulses are analysed and image formed on ratina is recognised by visual cortex.

Mechanism of Vision
The light rays passes through cornea, aqueous humour, lens and vitreous humour and focusses on retina where they generate potential (impulses) in rods and cones. The photosensitive compound (photopigments) in the human eyes is composed of **opsin** (a protein) and retinal (an aldehyde of vitamin-A). Light induces dissociation of retinal from opsin which changes the structure of the opsin. Thus, potential differences are generated in the photoreceptor cells.
This causes action potentials in the ganglion cells through the bipolar cells. These action potentials (impulses) are transmitted by the optic nerves to the visual cortex area in the occipital lobe of the cerebral hemisphere of the brain where the neural impulses are analysed and erect image is recognised

280 **(b)**
Centrosome or cell centre is situated close of the nuclear envelope and also called microtubule organising centre (MIOC). It plays an important role in animal cell division by producing microtubules or bipolar mitotic spindles. As the nerve cells lack centrosome, they are not capable to divide.

281 **(b)**
Cerebellum is an ovoid part of the brain and is located below the occipital lobes of the cerebrum.
Its surface is formed by numerous patches of grey matter, which deep down into white matter. Intermixing of white and grey matter provides the appearance of tree-like structure, which is known as arbor vitae.

282 **(d)**
A-Brain (encephalon); B-Cranial Nerves; C-Spinal Nerves; D-Spinal cord (myelon)
CNS lies along the main (longitudinal) axis of the body. The CNS consists of two parts, *i.e.,* the upper large brain or encephalon, situated in the head and the low long narrow spinal cord or myelon, located in the neck and trunk

283 **(d)**
The vitreous chamber in eye is filled with a viscous jelly-like vitreous humour containing 99% water, some salt, a little mucoprotein and hyaluronic acid. It is a part between lens and retina. At this periphery, it is condensed to form a vitreous membrane. It is mucoid connective tissue.

284 **(c)**
Olfactory lobe perceives sense of smell.

285 **(c)**
In the CNS, the majority of nerve cell bodies are found in the grey matter. The myelin

sheath of CNS axons is formed by oligodendropcytes. The blood-brain barrier isolates central neurons from alterations to plasma composition. The CSF is not an ultrafiltrate of plasma but is secreted by choroid plexus.

286 **(c)**
Tangoreceptors have sense of touch. Meissner's corpuscles are a type of tangoreceptor which are found in dermis of skin of finger tip, lips and nipples. These have sense of touch and gentle pressure.

287 **(b)**
Human eye ball is enveloped by three layers, *i.e.,* sclerotic layer, choroid layer and retinal layer outermost sclerotic layer is white portion of eye which mergas with transparent round window called cornea in center. Middle choroid layer lie close to retina and contain light absorbing pigments. In front it form celeary body, which is hidden by iris. Retinal, the innermost thin transparent appear purplish due to presence of eye pigment-rhodopsin

288 **(a)**
Hypothalamus is a part of vertebrate brain that is derived from the forebrain and located on the ventral surface below the thalamus and the cerebrum. It works as a control centre of autonomic nervous system, body temperature, sweating, hunger, thirst, sleep, fatigue, sex, love, hate, satisfaction, anger, pleasure, metabolism of carbohydrate, fat and water.

289 **(a)**
The axons transmit nerve impulses away from the cell body to a dendrite or to a neruromuscular junction

290 **(c)**
Grey matter is grey in colour containing cell bodies and it lies outside the white matter

291 **(b)**
The grey matter is composed of nerve cells, nerve fibres and neuroglia, which are non-myelinated, while white matter consists mostly of myelinated axons.

292 **(a)**
Pneumotaxic centre which can moderate the function of the respiratory rhythm centre is present in the **pons** region of the brain. Neural signal from this centre can reduce the duration of inspiration and thereby alter the respiratory rate.

293 **(b)**
Ten pairs of cranial nerves are present in fishes and amphibians. The cranial nerves **hypoglossal** is present in rabbit but absent in frog.

294 **(c)**
Hypothalamus is a control centre of autonomic nervous system. It controls hunger, thirst, sleeping, osmoregulation, thermoregulation, emotions like love, anger, pleasure, etc.

295 **(b)**
Mechanism of Hearing
Sound waves → Tympanic membrane → Vibrations → Ear ossicles (malleus, incus and stapes). The vibrations are passed through the oval window on to the fluid of counter where they generate waves which travel to Scala vestibuli → Reissner's membrane → Scala media → Tectorial membrane is vibrated → Tectorial membrane touches the hair cells organ of corti. As a result, nerve impulses are generated in the afferent neurons.
These impulses are carried by the afferent nerve fibres through the auditory nerve to the auditory nerve to the cortex in the **temporal lobe** of the cerebral hemisphere of the brain where the impulses are analysed and the sound is recognised. Ear also performs the function of balancing (equilibrium)

296 **(a)**
Neuron is the largest body cell. Neuron is the structural and functional unit of nervous system.

297 **(a)**
A nerve cell consists of cell body or perikaryon (containing the nucleus, Nissl's granule). Dendrites and an axon. These are specialized cells. These cells are the structural and functional unit of nervous system/tissues.

298 **(b)**
A-Dorsal root ganglion, B-White matter, C-Gray matter, D-Efferent pathway, D-Afferent pathway

299 **(d)**
The medulla is also called as the medulla oblongata. The medulla contains centres which control respiration, cardiovascular reflexes and gastric secretions

300 **(c)**
Protective covering of brain is called cranium.

301 **(a)**
Frog has 10 pairs of cranial nerves, while man has 12 pairs.

302 **(b)**
Atropine is an alkaloid obtained from *Atropa belladonna* and *Datura stramonium*.

303 **(a)**
A-Afferent, B-Efferent, C-Somatic motor, D-Autonomic, E-Sympathetic.
The afferent nerve fibres transmit impulses from tissues/organs to the CNS and the efferent fibres transmit regulatory impulses from CNS to the concerned peripheral tissues/organs.
The somatic neural system transmits impulses form the CNS to skeletal muscles while the autonomic nervous system transmits impulses from CNS to the involuntary organs and smooth muscles of the body. The autonomic neural system is classified into sympathetic neural system and parasympathetic neural system

304 **(c)**
Correct pairs are as follows:

Part/Gland	Secretion
Corpus luteum	Progesterone and oestrogen
Interstitial cells (testis)	Testosterone
Adenohypophysis(pituitary)	FSH
Acrosome	Hyaluronidase
Hypothalamus	Releasing or inhibiting neurohormones

305 **(a)**
A-Forebrain, B-Brain stem C-Corpus callosum, D-Cerebral aqueduct.
Forebrain consists of cerebrum, thalamus and hypothalamus. The medulla pons, midbrain and diencephalon are collectively called the brain stem. Cerebrum is divided longitudinally into the left and right cerebral hemisphere. The hemispheres are connected by a tract of nerve fibres called corpus callosum. **Cerebral aqueduct** is a canal that passes through the midbrain

306 **(a)**
One nerve fibre is attached to another nerve fibre *via* a junction called synapse. It is not a tight junction. A synapse is formed by the membrane of a presynaptic neuron and postsynaptic neuron, which may or may not is separated by a gap called synaptic cleft, *i.e.,* axon of one neuron end on the dendrite of next neuron

307 **(d)**
A resting nerve fibre is not conducting an impulse shows positive charge outside with respect to the inside of the plasma membrane. This difference in electrical charges across the plasma membrane is called the resting potential

308 **(b)**
Severe diarrhea, vomiting, watery stools are the chief symptoms of cholera. All these lead to dehydration. Therefore patient suffering form cholera are given a saline drip because Na^+ ions help in the retention of water in the body tissue.

309 **(a)**
Lateral to the blind spot, there is a depressed area of the retina, called **fovea centralis**, which contains only cones. Ability for vision is highest in the fovea.

310 **(a)**
Types of Sensory Nerves Olfactory, optic and auditory cranial nerves
Types of Motor nerves Oculomotor, pathetic, abducens, spinal, accessory and hypoglossal cranial nerves
Types of Mixed nerves Trigeminal, facial, glossopharyngeal and vagus cranial nerves

311 **(c)**
Bowman's glands, present in the lining of nasal epithelium, secretes mucus. All odoriferous materials give off chemical particles, which are carried into the nose with inhaled air and stimulate the nerve cells of the olfactory region when dissolved in this mucus.

312 **(a)**
Out of the given, accessory spinal is a motor nerve.

313 **(b)**
A nerve impulse is transmitted from one neuron to another through junctions called synapses. A synapse is formed by the membranes of a presynaptic neuron and a postsynaptic neuron, which may or may not be separated by a gap called synaptic cleft
There are two types of synapses, *i.e.,* electrical synapses and chemical synapses. At electrical synapses, the membrane of pre- and postsynaptic neurons are in very close proximity. Electrical current can flow directly from one neuron into the other across these synapses
Transmission of an impulse across electrical synapses is very similar to impulse conduction along a single axon. Impulse transmission across an electrical synapse is always faster than the across a chemical synapse. Electrical synapses are rare in our system
At a chemical synapse, the membranes of the pre- and postsynaptic neurons are separated by fluid-filled space called synaptic cleft. Chemicals called neurotransmitters are involved in the transmission of impulses at these synapses

314 **(b)**
The leg of frog moves on pinpointing even, when brain is crushed, because of simple reflex or unconditioned or inborn reflex.

315 **(b)**
Myelin sheath is interrupted at some places to form gaps. These gaps are called nodes of **Ranvier.**

316 **(a)**
Cerebrum forms the major part of the human brain. A deep cleft divides the cerebrum longitudinally into two halves, termed as the left and right cerebrum hemispheres. The layer of cells, which covers the cerebral hemisphere is called cerebral cortex. Cerebral cortex is referred to as the grey matter. While the inner part is made up of white matter

317 **(a)**
Brain acts as the command and control system

318 **(d)**
Presbyopia is the far sightedness which commonly develops with advancing age. This condition is due to loss of elasticity of the lens of the eye and reduced power of accommodation.

319 **(d)**
Muller's fibres occur in **retina** of eye.

320 **(c)**
Cerebrum is formed of one pair largest sized lobes called cerebral hemisphere. These form 80% weight of brain. Cerebral hemisphere controls all the voluntary activities of body. It is seat of memory, will, intelligency, reasoning and learning.

321 **(d)**
Two types of system in the body is responsible for inter-cellular communication nervous and hormonal.
1.Nervous system is responsible for short time and quick effect.

2.Endocrine system secretes hormone. Hormone effect is long lasting and slow.

322 **(a)**
A neuron comprises of cell body, axon and dendrites. The cell body contains cytoplasm, nucleus with organelles and Nissl's granules
The axons are long fibres which arises from the cell body. Dendrites are the short fibres with branched distal end

323 **(d)**
Multipolar neuron is a neuron that has one axon and several dendrons extending from its cell body in different directions.

324 **(c)**
Retina is the innermost non-vascular light sensitive coat. The optic part of retina has two parts pigmented and nervous part is transparent and contains three layers of cells-from inside-ganglion cells, bipolar cells and photoreceptor cells.

325 **(b)**
Neurotransmitters.
Synaptic knob possess synaptic vesicles containing chemicals called neurotransmitters

326 **(d)**
Based on the number of axon and dendrites, the neurons are multipolar (with one axon and two or more dendrites, found in the cerebral cortex), bipolar (with one axon and one dendrite; found in the retina of eye) and unipolar (cell body with one axon; found usually in the embryonic stage)

327 **(a)**
The outermost covering of brain is **duramater**, which is thick and non-vascular membrane.

328 **(b)**
The tympanic membrane is a thin, oval, tightly stretched membrane closing the external auditory canal internally. It separates the tympanic cavity from the external auditory meatus

329 **(b)**
Resting potential is the difference in electrical potential that exists across the membrane of nerve cells. The resting potential is maintained with the help of sodium-potassium pump.

330 **(a)**
Our paired eyes are located in sockets of skull called orbits. The adult human eyeball is nearly spherical in structure. The wall of the eyeball is composed of three layers. The anterior portion of this layer is called cornea. The middle layer choroid contains many blood vessels and looks bluish in colour
The inner layer is retina and it contains three layers of cells, *i.e.,* from inside to outside called ganglion cells, bipolar cells and photoreceptor cells

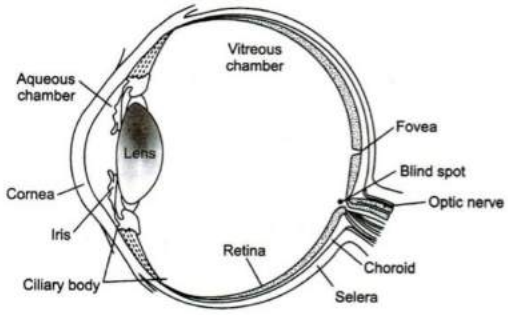
331 **(d)**
The primary visual area is located in occipetal lobe of cerebrum. Decoding and interpretation of visual information. shape and colour occurs in occipital lobe.

333 **(a)**
$3Na^+$ outwards for $2K^+$ into the cell.
The plasma membrane of the neuron is polarized due to the high out flow of Na^+ ions to outside and low intake of K^+ ion inside. $3Na^+$ ions outflow by the ion channel of plasma membrane and $2K^+$ ions inflow by it.
This creates a difference in the positive potential across the plasma membrane. The membrane is less positive inside which is normally termed as negative inside w.r.t outside

334 **(c)**
Temporal lobe possesses Wernicke's area that is responsible for understanding speech, writing and spoken words.

335 **(b)**
The vagus crania nerve (X^{th} cranial) of human is made up of both sensory (incoming of afferent) and motor (outgoing or efferent) nerve fibres. It regulates the function of heart rate, respiration rate and digestive activities. Excessive stimulation of vagus nerve give rise to peptic ulcer in humans.

336 **(c)**
Iris.
The choroid layer is thin over the posterior two third of the eyeball. But it becomes thick in the anterior part of form ciliary body. The ciliary body itself continues forward to form a pigmented and opaque structure called the iris which is the visible coloured portion of eye. The eyeball contains a transparent crystalline lens which is held in place by ligaments attached to ciliary body.
In front of the lens, the aperture surrounded by the iris is called the pupil. This diameter of the pupil is regulated by muscle fibres of iris



Internal structure of eye

337 **(b)**
The cristae of rabbit ear helps in maintaining balance in transverse position of longitudinal axis of semi-circular canals.

338 **(b)**
The inner parts of cerebral hemisphere and a group of associated deep structures like amygdala, hippocampus, etc. form a complex structure called the limbic lobe or limbic system along with hypothalamus. It is involved in the regulation of sexual behavior expression of emotional reactions, (*e. g.*, excitement, pleasure, rage and fear) and motivation

339 **(d)**
Purple.
Both (a) and (b), *i.e.,* cones and rods

340 **(d)**

Nervous system is formed of four types of cells.
(i)**Neurons** - structural and functional unit.
(ii)**Neuroglia** - Phagocytic and provide nutrition to neuron
(iii)**Ependymal cells** - their cilia move the cerebrospinal fluid
(iv)**Neurosecretory cells** - these secrete neurochormones.

341 **(c)**
In myelinated nerve fibre, the myelin sheath is not continuous and remains interrupted at some places. These are known as nodes of Ranvier. These help in the saltatory conduction of nerve impulse. The non-myelinated nerve fibres do not possess nodes of Ranvier.

342 **(b)**
Covering of muscle cells is known as sacrolemma. Neurons are the fundamental units of nervous system. Each neuron has the following basic parts:
1.The cell body or cyton

2.Dendrons

3.Axon

343 **(d)**
A conditioned reflex is a response acquired by an animal during its own life by association of a new sensory stimulus (say bell) with an inborn response (salivation)

344 **(b)**
The neural organization is very simple in lower invertebrates. It is better organized in insects and more developed in vertebrates

345 **(c)**
Jacobson's organ is an auxillary olfactory sense organ that is found in many animals. In mammals, the sensory neurons of Jacobson's organ detect specific chemical compounds contained within scents that are often but not always, large non-volatile molecules. It is well developed in snakes and lizard.

346 **(d)**
The nervous system is composed of neurons (nerve cells), which exercise control by sending electrical signals called nerve impulse. The nervous control is speedy and flexible but its effect is localized. A neuron may transmit impulse as fast as 150 impulse

347 **(c)**
Synapse is a site of junction between axon of one neuron and dendrites of another neuron. Each neuron receives an impulse through its dendrites and passes it on to the next neuron through synapse

348 **(b)**
The ciliary muscles are smooth muscles are of circular and meridional type. These muscles alter the shape and lens during accomodation.
Suspensory ligaments are attached to the ciliary body, which in turn are attached to the capsule that surrounds the lens of the eye.
Due to the action of the muscles of the ciliary body and suspensory ligament, the focal length of the lens can be changed. Then, the objects can be focussed in different intensity of light from varying distances

349 **(d)**
Pupil is the central perforation of iris. Its size is controlled by the contraction of radial (dilates pupil) and circular (constricts pupil) muscles if iris in response to dim and strong light respectively. Both of these muscles are under control of autonomic nervous systems.

350 **(d)**
There are two types of synapses namely electrical synapses and chemical synapses. At electrical synapses, the membrane of pre and post synaptic neuron are in very close proximity transmission of an impulse across electrical synapses is very similar to impulse conduction along a single axon

351 **(c)**
The rods bear a long with thin cylinder, each of which contains a purple pigment rhodopsin made of a protein and vitamin-A. light splits rhodopsin into a pigment retinene and a protein scotopsin (opsin). This process is called bleaching. This depolarizes the rod cells to release a neurotransmitter, transmitting the nerve impulse to the bipolar cells, ganglion cells and then to the optic nerve fibres. In night, light is received from

the moon and stars. It is resynthesized from retinene and scotopsin by vitamin-A.

352 **(b)**
Non-myelinated nerve fibre is enclosed by a Schwann cell that do not form a myelin sheath around the axon

353 **(a)**
High concentration of K^+ and low concentration of N^+ inside the axon.
Both A and R true and R is the correct explanation of A.
When a neuron is not conducting any impulse, *i.e.,* resting, the axonal membrane is comparatively more permeable to potassium ions (K^+) and nearly impermeable to sodium ions (Na^+). Similarly, the membrane is impermeable to negatively charged proteins present in the axoplasm. Consequently, the axoplasm inside the axon contains high concentration of K^+ and negatively charged proteins and low concentration of Na^+. In contrast, the fluid outside the axon contains a low concentration of K^+, a high concentration of Na^+ and thus form a concentration gradient

354 **(a)**
The fluid-filled inner ear called **labyrinth** consists of two parts, the bony and the membranous labyrinth. The bony labyrinth is a series of channels. Inside these channels lies the membranous labyrinth, which is surrounded by a fluid called perilymph.
The membranous labyrinth is filled with a fluid called endolymph. The coiled portion of the labyrinth is called **cochlea.**
The membranes constituting cochlea, the Reissner's and basilar, divide the surrounding perilymph filled bony labyrinth into an upper scala vestibule and a lower scala tympani. The space within cochlea called scala media is filled with endolymph.
At the base of the cochlea, the scala vestibuli ends at the oval window, while the scala tympani terminates at the round window which opens to the middle ear

355 **(b)**
When a nerve fibre is stimulated, its membrane becomes more permeable to sodium ions, hence, more sodium ions enter the axon than potassium ions leaving it. As a result, the positive and negative charges on the outside and inside of the membrane are reversed. The membrane with reversed polarity is called depolarized.

356 **(b)**
Nissl's granules are found in both cell body and dendrites

357 **(d)**
There are two types of axons-myelinated and non-myelinated. The myelinated nerve fibres are enveloped with Schwann cells, which form a myelin sheath around the axon. The gaps between two adjacent myelin sheaths are called nodes of Ranvier. Myelinated nerve fibres are found in spinal and cranial nerves. Non-myelinated nerve fibre is enclosed by a Schwann cell that does not form a myelin sheath around the axon, and is commonly found in autonomous and the somatic neural systems.

358 **(c)**
The brain is the central information processing organ of our body

359 **(d)**
I, II and III.
Both (a) and (b), *i.e.,* cones and rods

360 **(c)**
During synaptic excitation, the postsynaptic cell depolarizes. Epsps are graded in intensity and can summate.

361 **(a)**
Ideally, there are as many pairs of spinal nerves as the number of vertebrae. However, in man 31 pairs of spinal nerves are present including 8 pairs of cervical nerves, 12 pairs of thoracic nerves, 5 pairs of lumbar nerves, 5 pairs of sacral nerves and 1 pair of coccygeal nerves.

The cervical vertebrae are the vertebrae of neck region. Whether the neck is short as in mouse or long as in a camel or giraffe, their number is seven in all mammals (including man) except some, *e. g.*, sloths and the sea cows.

362 **(a)**

In resting nerve fibre (a nerve fibre that is not conducting an impulse), sodium ions (Na^+) predominate in the extra cellular fluid, whereas potassium ions (K^+) predominate in the intracellular fluid (within the fibre). This result in the fact that, the resting membrane has only a poor permeability for Na^+ although it has a higher permeability for K^+.

363 **(c)**
There are twelve cranial nerves in mammals. Hypoglossal (the 12^{th}) cranial nerve is responsible for movement of neck and tongue. It contains both sensory and motor fibres.

364 **(d)**
The vagus nerve is responsible for various tasks such as gastrointestinal peristalsis, sweating and quite a few muscle movements in the mouth, including speech and keeping the larynx open for breathing.

365 **(b)**
The rods are longer, slender and cylindrical, while cones are shorter, thicker and somewhat cube-shaped. Rods are related with vision in dim light. Cones are related with day vision and colour vision. Retina of nocturnal birds, such as owls, contains only **rods**. That is why, owls sleep during day and hunts during night.

366 **(b)**
The mammalian brain is covered by three protective meninges-the innermost piamater, middle arachnoid and outermost duramater. The space between piamater and arachnoid is called sub-arachnoid space.

367 **(c)**
Areolar connective tissue contains collagen, epithelium contains keratin and muscle fibres contains actin but neuron does not contain melanin. Neuron is the structural and functional unit of nervous system.

368 **(a)**
Sympathetic nervous system is a type of autonomic nervous system, which has its role in opposing the parasympathetic nervous system. There is an erector pilli, which causes erection of hair under the control of sympathetic nervous system

369 **(d)**
Dendrites are short fibres, which branch repeatedly and projects out of the cell body and also contain Nissl's granules

370 **(a)**
Interoceptors are receptors, which are sensitive to stimuli coming from internal body organs. These carry sensations of pain, thirst, visceral pain, nausea as well as sexual and circulatory sensations.

371 **(a)**
Malleus is attached to the tympanic membrane and the stapes is attached to the oval window of the cochlea

372 **(d)**
A locus of nerve tissue in the ventro-medial nucleus of the hypothalamus is known as satiety center and it controls the appetite

373 **(c)**
Human eyes have remarkable power of accommodation by changing the convexity of the lens. Due to action of the muscles of ciliary body and suspensory ligament the focal length of the lens can be changed. Then the objects can be focused in different intensity of light from varying distances. For accommodation of distant objects, ciliary muscles relaxed and suspensory ligaments tightly stretched.

375 **(c)**
The cell body of neuron contains certain granular bodies called Nissl's granules

376 **(d)**
The pinna collects the vibrations in the air, which produce sound. The external auditory meatus leads inwards and extends upto the tympanic membrane (the ear drum). There are very fine hairs and wax secreting sebaceous glands in the skin of pinna and meatus. The tympanic membrane is composed of connective tissues covered with skin outside and with mucus membrane inside

377 **(a)**
Retina is the lining of the interior of the vertebrate eye containing a concentration of photoreceptor cells known as rods and cones

that are connected to the optic nerve *via* bipolar cells.

378 **(a)**
Rhodopsin, also known as visual purple, is a biological pigment in photoreceptor cells of the retina that is responsible for the first event in the perception of light

379 **(a)**
Level of organization in case of cnidarian is tissue level. So, the neural organization must be made up to this level. In *Hydra,* neural organization is made up of network of neurons

380 **(a)**
All multicellular animals contain elongated nerve cells, called neurons. Each neuron has a cell body, axon and smaller processes called dendrites. An **axon** is the process of a nerve cell that carries impulses away from it. Axons run parallel to one another and each is surrounded along its whole length by series of Schwann cells. They may have myelin sheath.

381 **(a)**
In human capacity of hearing is 16-20,000 cycles/second. The low frequencies sensitise the sensory cells of ear, near the tip of cochlea and high frequency towards the oval window.

382 **(c)**
The human neural system includes CNS and PNS. Nervous system exercise control by sending electrical signals called nerve impulses. The endocrine system consists of specialized glands, which bring about control by sending chemical messengers termed as hormones.
For a quick coordination, it is neural system that provides an organised network of point to point connections. In lower invertebrates, the neural organization is very simple

383 **(b)**
Cerebrum forms the major part of the human brain. A deep cleft divided the cerebrum longitudinally into two halves-left and right cerebral hemispheres. The hemispheres are connected by a tract of nerve fibres called **corpus callosum.**

384 **(a)**
The function of **eustachian tube** is to equalize air pressure on both sides (external and middle ear) or tympanic membrane. Thus, it connects middle ear with external ear.

385 **(d)**
Spinal cord is an elongated cylindrical structure which lies in the neural canal of the vertebral column and is continued with the medulla oblongata through foramen magnum of the skull. It has an H-shaped central area of grey matter surrounded by an outer layer of white matter.

386 **(c)**
Both (a) and (b).
The knee-jerk reflex is an example of spinal reflex, which involves only control of spinal cord. Brain is not involved in this process

387 **(b)**
Medulla oblongata controls involuntary functions of body through a number of centres like cardiac centre, respiratory centre, vasomotor centres (contraction of blood vessels) salivary centres etc.

388 **(c)**
Olfactoreceptors are smell senses.

389 **(c)**
Three key functions of myelin sheath are:
(i)Protection of nerve fibre.
(ii)Insulation of nerve fibre
(iii)Increases the rate of transmission of nerve impulses.
Key functions of nodes of Ranvier include:
(i)Allowing nutrients and waste products to enter/leave the neuron.
(ii)Allowing nerve impulses to move along the neuron through a process of de-polarization and re-polarization of the nerve membrane.

390 **(c)**
Both (a) and (b)

391 **(d)**
Syrinx is the sound producing organ of birds, containing typically a resonating chamber with elastic vibrating membranes of connective tissue (vocal cords); situated at points where trachea splits into bronchi.

392 **(a)**
A functional unit consisting of a receptor neural pathway and effector neuron.

Pneumotaxic centre is present in the pons varolli, which can moderate the functions of respiratory rhythm centre. Neural signals from this centre can reduce the duration of inspiration and thereby, after the respiratory rate

393 **(d)**
Salivation is controlled by **medulla oblongata**. Respiratory centre are also found in medulla oblongata.

394 **(c)**
Static equilibrium refers to orientation of the body (mainly head) relative to gravity. Untriculus and sacculus are considered to be sense organs of static equilibrium, while three semi-circular canals maintain dynamic equilibrium.

395 **(c)**
The ears perform two sensory functions, hearing and maintenance of body balance

396 **(c)**
Neurons are excitable cells because their membrane are in a polarized state. Different types of selectively permeable channels are present on the neural membrane. When a neuron is not conducting any impulse, *i. e.*, resting, the axonal membrane is comparatively more permeable to potassium ion (K^+) and nearly impermeable to sodium ion (Na^+).

398 **(c)**
The receptors for the sense of taste are found in taste buds, mostly located in tongue. These receptors are called gustatoreceptors. Most of the taste buds are located within papillae that extends down into the epithelium of the tongue

399 **(b)**
Pons Varolii is situated in front of the cerebellum below the midbrain and above the medulla oblongata. It consists of nerve fibres and from pons bridge between the two hemispheres of the cerebellum.

400 **(d)**
Red, green and blue lights.
Both (a) and (b), *i.e.,* cones and rods

401 **(b)**
Piamater is thin innermost vascular and pigmented sheath that lies in contract with brain. At two places, it is fused with roof of brain to form choroid plexuses for secreting cerebrospinal fluid (CSF). Arachnoid is thin webby and porous non-vascular sheath. A narrow sub-arachnoid space occurs between arachnoid and piamater. It contains cerebrospinal fluid (CSF) and connective tissue strands.

402 **(a)**
Unipolar neurons are neurons which have a cell body with axon only they can be seen in the embryonic stage

403 **(b)**
All along its median longitudinal line, the floor of scala media (basilar membrane) is thickened inwards, bulging into endolymph as a sensory ridge called the organ of Corti. Organ of Corti is associated with hearing.

404 **(b)**
The **cone cells** are the light sensitive receptor cells, found in the retina of all diurnal vertebrates. Cones are specialized to transmit information about colour and are respectively for the visual activity of eye.

405 **(b)**
Synapsis are of two types, *i.e.,* electrical synapses and chemical synapses. Electrical synapses is mediated by electrical impulse. It is very fast but rare. On the other hand, chemical synapses is mediated by chemicals such as neurotransmitter

406 **(a)**
Neurons regulates the endocrines the activity but endocrine activity do not regulates the neurons

407 **(d)**
Cortisone is a corticosteroid that is itself biologically inactive and is formed naturally in the adrenal gland (adrenal cortex).

408 **(d)**
Noise has been well defined as unwanted sound which is being dumped into the atmosphere to disturb the unwilling ear. Sound intensity of 100 dB becomes uncomfortable and 130 dB painful.

409 **(b)**
Choroid infront from ciliary body, which is thick round and referred. It is hidden by iris (coloured membrane)

410 **(b)**

The receptors for the sense of taste are found in taste buds, mostly located in tongue. These receptors are called gustatoreceptors. Most of the taste buds are located within papillae that extend down into the epithelium of the tongue.

411 **(d)**
Hypothalamus is a control centre for hunger, thirst, sweating, sleep, fatigue, temperature, anger, pleasure, love, hate and satisfaction. Thus, if a man is suffering from the given abnormalities, he has a tumour in his hypothalamus.

412 **(d)**
Eustachian tube connect middle ear cavity with pharynx

413 **(d)**
Human nervous system has two parts-central and peripheral. The peripheral nervous system is distinguished into somatic nervous system, which controls the masculo-skeletal system, external sense organs and skin under the will and automic nervous system controlling the smooth muscles of internal organs and glands without consulting the will.

414 **(a)**
From the brain of rabbit, 12 pairs of cranial nerves originate.

415 **(b)**
In the middle ear, the organ of Corti is a structure located on the basilar membrane which contains the hair cell that acts as the auditory receptors. The hair cells are present in rows on the internal side of the organ of Corti. The basal end of the hair cell is in close contact with the afferent nerve fibres. A large number of processes called stereo cilia are projected from the apical part of each hair cell. Above the rows of the hair cells is a thin elastic membrane called **tectorial membrane**

416 **(a)**
A synapse is the link between one neuron and another. There is no physical contact between one neuron and the next, instead there is a tiny gap called synaptic cleft.

417 **(c)**
Reflex pathway involves both PNS and CNS. In case of CNS, it may be spinal cord (spinal reflexes; more common) and brain (cerebral reflexes; less common)

418 **(b)**
A-axon terminal, B-synaptic vesicles, C-synaptic cleft, D-receptors
E- neurotransmitters

419 **(a)**
Cerebellum is a portion of hindbrain. Its primary function is to maintain posture, orientation and equilibrium of body by coordinating and regulating tone and contraction of voluntary muscles mainly according to the commands of cerebrum.

420 **(d)**
All are correct I,III and IV.

Neuroglial cells are the packing and supporting cells found in brain and spinal cord. They are of three types, *i.e.,* astrocytes, oligodendrocytes and microglia

Astrocytes are responsible for separation of two neurons by insulation. Oligodendrocytes are a category of glial cells that form myelin sheath around the axon

Microglia are phagocytic as well as scavengers. They engulf microbes and cellular debris. Nearly 50% of all brain cells are neuroglia

Schwann cells are the neuroglial cell, which are present in PNS

421 **(b)**
The **frontal bones** form forehead, parietal extends to sides, while occipital curves to form the base of skull. Below the much larger parietal bones called temporal bones, have opening that lead to the internal ear. The temporal bones lie inferior to the parietal bones and meet them at the squamous sutures.

422 **(a)**
Choroid plexus is a non-nervous vascular pigmented tissue developing from the roof of third and fourth ventricles of the vertebrate brain.

423 **(a)**
Limbic system.

The inner parts of cerebral hemisphere and a group of associated deep structures like amygdala, hippocampus, etc. form a complex structure called the limbic lobe or limbic system along with hypothalamus. It is involved in the regulation of sexual behavior expression of emotional reactions, (*e. g.*, excitement, pleasure, rage and fear) and motivation

424 **(a)**

The human brain is well protected by the skull. The brain is situated in the cranial cavity of the skull. The cranial bones protects it from mechanical injury

425 **(b)**

A wave of action potential is termed as a nerve impulse.

When a nerve fibre receives stimulus inside the cell, plasma membrane become positively charged with respect to outside. The change in polarity across the plasma membrane is known as an action potential. The membrane with this reversed polarity across it is said to be depolarized. The reversed polarity then passes a wave along the nerve fibre. This wave of reversed polarity or dipolarisation (action potential) moving down an axon is called a nerve impulse

426 **(c)**

Cones and their photopigments.

Both (a) and (b), *i.e.,* cones and rods

427 **(c)**

Temporal lobe consists of olfactory smell area.

428 **(b)**

The vagus nerves (parasympathetic) supply mainly the SA and AV-node and atrial muscles. The parasympathetic stimulation reduces the rate at which impulses are produced, decreasing the rate and force of the heart beat.

429 **(c)**

Cavity of midbrain called iter or aqueduct of Sylvius communicates diocoel with fourth ventricle of hindbrain.

430 **(b)**

In normal resting stage, nerve fibres are in the form of polarized stage with a resting membrane potential of -70 mV. When a nerve impulse travels through nerve fibre, depolarization takes place due to influx (*i. e.*, inside movement) of Na^+ ion.

431 **(b)**

Feature	Sympathetic Nervous System	Parasympathetic Nervous System
Pupil of the eye	Dilates	Constricts
Salivary gland	Decreased secretion	Increased secretion
Heart rate	Increased	Decreased
Intestinal	Inhibits	Stimulate

432 **(b)**

Hypothalamus is a very important part of the brain and lies at the base of the thalamus

433 **(b)**

Hypothalamus acts as a bridge between nervous system and endocrine system. It is a centre for hunger, thirst, sweating, sleeps, fatigue, temperature, anger, pleasure, love, hate, satisfaction, to release factors for endocrine glands, to control autonomic nerves system and regulation of parasympathetic activity.

434 **(b)**

Broca's area is situated in the frontal lobe of cerebrum usually on the left side. It is related to the translation of thoughts into speech, hence, it is also called **motor speech area**.

435 **(c)**

Fibres of the tracts are covered with the myelin sheath which constitutes the inner part of the cerebral hemisphere. They give an opaque white appearance to the layer and hence is called the white matter

436 **(b)**

The PNS includes somatic nervous system and autonomic nervous system

Somatic Nervous System	Autonomic Nervous System
1. Relays voluntary impulses from the CNS to skeletal muscles	1. Relays impulses from the CNS to the involuntary organ and smooth

2. The nerve fibres forming the nerves of the PNS are (a) Efferent nerve fibres and (b) efferent nerve fibres	muscles of the body 2. The nerve fibres forming the nerves of the PNS are efferent nerve fibres It is divided into sympathetic nervous system and parasympathetic nervous system

437 **(b)**
These are 31 pairs of spinal nerves in human. These are classified into five groups :- cervical-8 pairs, thoracic-12 pairs, lumbar-5 pairs, scaral-5 pairs, coccygeal-1 pairs

438 **(a)**
The hindbrain or rhombencephalon basically contains cerebellum (or metencephalon) and medulla oblongata (myelencephalon). Telencephalon or cerebrum is the part of forebrain.

439 **(d)**
The hindbrain comprises pons, cerebellum and medulla oblongata

440 **(c)**
Vestibular apparatus is the part of the inner ear, which together with the cochlea forms the membranous labyrinth. It is associated with the body balance.

441 **(a)**
A nerve impulse may be defined as wave of depolarization of the membrane of the nerve cell. The nerve impulse travels along a neuron across a synapse (junction), between one neuron and another or between a neuron and an effector, such as a muscle or gland. The synapse is an area of functional contact between one neuron and another for the purpose of transferring information. **Sir Charles Sherrington** (1861-1954) was the first person, who used the term 'synapse' to the junctional points between two neurons.

442 **(a)**
The Post-ganglionic nerve fibres of sympathetic nervous system are adrenergic, *i. e.*, they release the neurotransmitter noradrenaline at their termination.

443 **(d)**
Meninges covers the brain and spinal cord.

444 **(b)**
Cone cells are the photoreceptors of the vertebrate retina that provide both colour vision and visual acuity in bright light. Corpus luteum is a part mammalian ovary. It is formed after ovulation and acts as an temporary endocrine gland by releasing progesterone hormone for the maintenance pregnancy.

445 **(d)**
A-Organ of Corti, B-Basilar membrane, C-Hair cells

447 **(c)**
The posterior part of the retina, which is just opposite to the lens is called fovea centralis or yellow spot, which contains only cones and has yellow pigment. The images are normally focused on this area.

448 **(a)**
Corpus callosum is single thick bundle of nerve fibres and forms a communication bridge between left and right cerebral hemispheres and allows information to pass from one side of the brain to other side.

449 **(d)**
Retina is the innermost, thin and transparent, purpulish red due to the presence of the eye pigment rhodopsin.

450 **(c)**
Cerebral hemisphere of forebrain is divided into frontal, parietal, temporal and occipital lobes. The occipital lobe is where your eyes see and interpret what is seen.

451 **(d)**
A neuron is a microscopic structure, which is composed of three major parts, *i.e.,* cell body, dendrites and axon

452 **(b)**
Trigeminal nerve or trigeminus is fifth pair of cranial nerves in frog.

453 **(a)**
Medulla oblongata is the centre to regulate heart beat, blood pressure, gut peristalsis, food swallowing, vomiting and gland secretion.
Hypothalamus regulates body temperature, controls emotions like love, anger, pleasure and satisfaction.

454 **(a)**
Due to olfactory effect, mouth becomes watery when we look on the delicious food.

455 **(a)**
Malleus is the outermost, hammer ossicle and is attached to the inner surface of membrane. The middle ear ossicle i.e., incus is the anvil and attached to stapes by a ball and socket joint. **Stapes** is the innermost ossicle, articulates with malleus by a synovial joint.

456 **(c)**
There are two types of photoreceptor cells namely (i) Rods and (ii) Cones
These cells contains the light-sensitive proteins called the photopigments. The daylight (photopic) vision and colour vision are the functions of cones and the twilight (scotopic) vision is the function of the rods. The rods contains a purplish-red protein called the rhodopsin or visual purple, which contains a derivative of Vitamin-A. In human eye, there are three types of cones which possess their own characteristic photopigments that respond to red, green and blue lights
The sensations of different colours are produced by various combinations of these cones and their photopigments. When these cones are stimulated equally, a sensation of white light is produced

457 **(b)**
The neurosensory layer of eye is the layer on which image is formed, this consists of retina, which includes rods and cones in it. Rods are helpful for visualization in dim light and is responsible for black and white vision, while cone cells produce sharp, coloured image in bright light. So, cones are helpful in perception and differentiation of colours.

458 **(b)**
Reflex action is an immediate involuntary action of any organ or part of the body in response to a particular stimulus. Path of reflex action is:
Receptor → Spinal cord → Muscles