BIOLOGY

BOOKS - CENGAGE BIOLOGY

NERVOUS SYSTEM AND SENSE ORGANS : CONTROL AND CO-ORDINATION

Mandatory Exercise Exercise Set I

1. Define the following:

Central nervous system

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2. Define the following:

Receptor

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3. Define the following:

Reflex action

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4. Define the following:

Neurotransmitter

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5. Define the following:

Neurons

6. Differentiate the following:

Simple reflex and conditioned reflex

7. Differentiate the following:

Somatic nervous system and autonomic nervous system

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8. Differentiate the following:

Cerebrum and cerebellum

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9. Differentiate the following:

Grey matter and white matter

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10. Complete the following table to indicate the differences between the three types of neurons found in the nervous system.

Neuron type	Role
Sensory neurons	
	Carry information from the CNS to effectors.
Relay neurons	

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11. Human beings have_____ cranial nerves.

A. 5 pairs

B. 10 pairs

C. 12 pairs

D. 20 pairs

Answer:

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12. The nature of nerve impulse conduction is

A. mechanical

B. thermal

C. electrochemical

D. chemical

Answer:

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13. This question consists of two statements each: assertion (A) and reason (R). To answer this question, mark the correct alternative as directed below.

Assertion: Cerebellum is large, lobed and convoluted in active animals, Reason: Cerebellum co-ordinates voluntary movements and helps maintain posture and equilibrium.

A. If both A and R are true, R is the correct explanation of A.

B. If both A and R are true but R is not the correct explanation of A

C. If A is true but R is false

D. If both A and R are false.

Answer:

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14. Very briefly describe the meninges of brain

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15. Which of the following accurately traces the pathway of a reflex arc?

A. effector $\rightarrow$ motor neuron interneuron $\rightarrow$ brain $\rightarrow$ sensory neuron

B. receptor $\rightarrow$ spinal cord interneuron $\rightarrow$ brain $\rightarrow$ sensory neuron.

C. receptor $\rightarrow$ sensory neuron interneuron $\rightarrow$ motor neuron $\rightarrow$ effector.

D. sensory neuron $\rightarrow$ interneuron brain $\rightarrow$ effector

Answer:

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16. Mention the function of cerebrospinal fluid.

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17. Mention the parts of forebrain.

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18. What is corpus callosum?

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19. Give scientific reasons:

Synapse acts as a one-way valve

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20. Give scientific reasons:

Conditioned reflex is likely to be lost with time.

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21. Give scientific reasons:

Surface of the cerebrum is highly folded.

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Mandatory Exercise Exercise Set Ii

1. Very briefly explain the following:

Fovea centralis

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2. Very briefly explain the following:

Blind spot

Watch Video Solution

3. Very briefly explain the following:

Accomodation

Watch Video Solution

4. Very briefly explain the following:

Perilymph

Watch Video Solution

5. Very briefly explain the following:

Filiform papillae

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6. Give location of the following:

Marculae _____

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7. Give location of the following:

Organ of corti _____

View Text Solution

8. Give location of the following:

Aqueous humour _____

View Text Solution

9. Give location of the following:

Endolymph _____

View Text Solution

10. Sense of smell is perceived by

A. pituitary

B. hypothalamus

C. olfactory lobe

D. cerebrum

Answer:

View Text Solution

11. This question consists of two statements each: assertion (A) and reason (R). To answer this question, mark the correct alternative as directed below

Assertion: Pain receptors can react to thermal and chemical stimuli also besides mechanical stimuli. Reason: The pain receptors are free

nerve endings that penetrate between the epidermal cells.

A. If both A and R are true, R is the correct explanation of A.

B. If both A and R are true but R is not the correct explanation of A.

C. If A is true but R is false

D. If both A and R are false.

Answer:

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12. 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 the retina

D. on the yellow spot

Answer:

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13. Which of the following pairs is correctly matched?

A. Saliva - taste

B. Sweat - thermoregulation

C. Maculae - hearing

D. Organ of corti – balancing

Answer:

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14. Give reasons

A. Albinos have pink eyes

B. Force of vibration is increased in the middle ear

C. Cornea transplants are successful

D. Some people cannot see in the dark

Answer:

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15. Which of the following accurately traces the pathway of a sound wave as it enters the ear and is converted to an action potential?

A. Eustachian tube $\rightarrow$ Ossicles $\rightarrow$ Cochlea $\rightarrow$ auditory nerve

B. Auditory canal $\rightarrow$ Tympanic membrane $\rightarrow$ Auditory nerve $\rightarrow$ Cochlea

C. Auditory canal $\rightarrow$ Ossicles $\rightarrow$ Oval window $\rightarrow$ Cochlea Auditory nerve

D. Eustachian tube $\rightarrow$ Tympanic membrane $\rightarrow$ Ossicles $\rightarrow$ Cochlea $\rightarrow$ Auditory nerve

Answer:

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16. There is a point in eye where image is not perceived and why?

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17. When a person climbs up the hill, the person starts feeling pain in the ear. Why?

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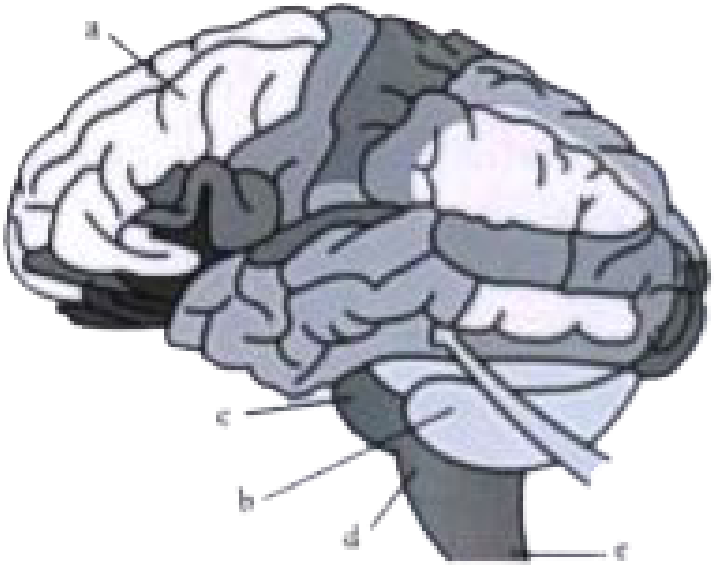
Consolidated Exercise

1. Study the following figure carefully and answer the following questions.



(a) Label the parts marked as (a), (b), (c), (d) and (e).

(b) Give one major function of each

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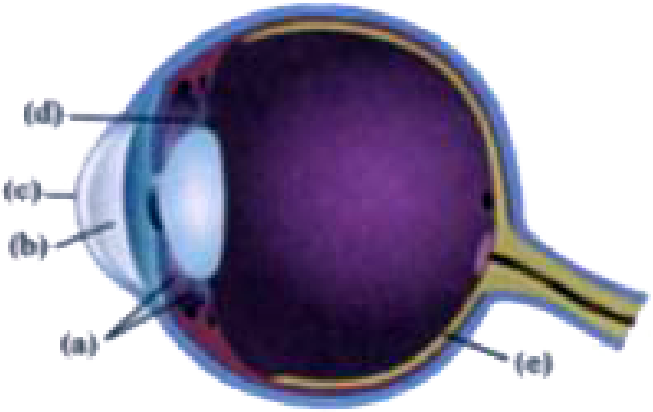
2. Study the figure carefully and answer the following questions:



(a) Label the parts marked as (a), (b), (c), (d) and (e).

(b) Give one major function of each on this part.

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3. Match with one or more than one correct answer.

Column I	Column II
(i) Cerebral hemispheres	(a) gray matter inside and white matter outside
(ii) Medulla oblongata	(b) Fore brain
(iii) Spinal cord	(c) Corpora quadrigemina
(iv) Mid brain	(d) Cardiac centre
(v) Spinal nerves	(e) Corpus collosum
	(f) Central canal
	(g) Thirty one pairs

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4. Match with one or more than one correct answer.

Column I	Column II
(i) Myopia	(a) Rod cells
(ii) Rhodopsin	(b) Convex lenses
(iii) Iodopsin	(c) Concave lenses
(iv) Hypermetropia	(d) Farsightedness
(v) Endolymph	(e) Cone cells
	(f) Membranous labyrinth
	(g) Nearsightedness

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5. Complete the crossword puzzle using the clues given below.

Across

2. The largest part of the brain.

4. Receives messages and sends them to the cell body.

5. Neurons are nerve_____.

7. An involuntary and automatic response to a stimulus.

8. Connects the brain to the spinal cord.

9. The part of a nerve cell that carries messages away from the cell.

Down

1. The nerve cells.

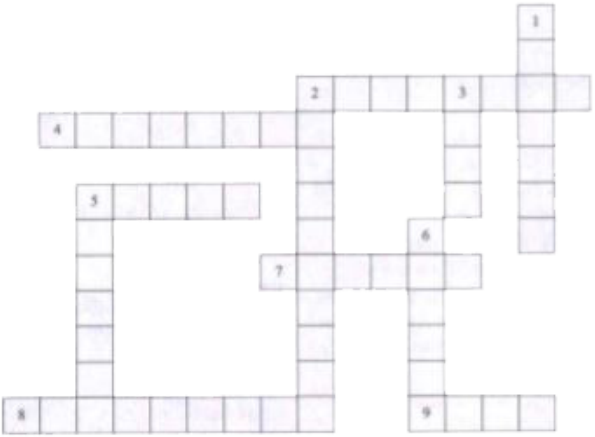
2. The part of the brain that co-ordinates voluntary muscle movement.

3. Taste____ are the major sensory receptors

for taste

5. A fluid-filled structure in the inner ear.

6. Tissue at the back of the eye that is sensitive to light.



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6. Which of these pairs is matched correctly?

A. Cerebrum-thinking and memory

B. Thalamus-motor and sensory centres.

C. Hypothalamus-internal environmental factor.

D. Cerebellum-motor co-ordination:

Answer: C

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7. A spinal nerve takes nerve impulses

A. to the CNS

B. away from the CNS

C. only inside the CNS

D. only from the cerebrum

Answer: C

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8. The autonomic system has two divisions called

A. the CNS and PNS

B. the somatic and skeletal systems

C. the efferent and afferent systems

D. the sympathetic and parasympahtetic divisions

Answer: A

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9. A sensory receptor

A. is the first portion of a reflex arc

B. initiates nerve impulses

C. responds to only one type of stimulus

D. is associated with a sensory neuron

Answer: B

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10. Which gives an incorrect function for the structure?

A. Lens-focusing

B. Iris-regulation of amount of light

C. Choroid-location of cones

D. Sclera-protection

Answer: C

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11. Which is a reflex action?

A. Swallowing of food

B. Shivering in cold

C. Salivation at choicest food

D. Closure of eye lids by flashing light

Answer: C

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12. Parkinson's disease (Characterized by tremors and progressive rigidity of limbs) is cause by degeneration of brain neurons that are involved in movement control and make use of neurotransmitter

A. acetylcholine

B. norepinephrine

C. dopamine

D. epinephrine

Answer: B

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13. Junction between dendrites and axon is known as

A. synapse

B. collateral

C. synapsis

D. foramen of magnum

Answer: C

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14. Which of the following is not an involuntary action?

A. Vomiting

B. Chewing

C. Heart beat

D. Salivation

Answer: D

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15. Which one of the following controls the peristaltic movements of alimentary canal?

A. Cerebrum

B. Cerebellum

C. Pons

D. Medulla

Answer: D

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16. All the voluntary actions of our body are controlled by:

A. Cerebrum

B. Cerebellum

C. Pons

D. Medulla

Answer: D

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17. The part of brain which controls the involuntary actions such as heart beat, breathing, blood pressure, etc. is called

A. Pons

B. Medulla

C. Cerebrum

D. Cerebellum

Answer: D

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18. The part of brain which takes part in regulating respiration in the human body is:

A. Medulla

B. Pons

C. Cerebellum

D. Cerebrum

Answer: C

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19. In a neuron, the conversion of electrical signal to a chemical signal occurs at/in:

A. Dendrite end

B. Cell body

C. Axon end

D. Myelin sheath

Answer: A

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20. The gustatory receptors of our body are in one of the following organs. This organ is:

A. Ear

B. Nose

C. Tongue

D. Skin

Answer: C

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21. The olfactory receptors in humans are located in:

A. Eyes

B. Tongue

C. Ears

D. Nose

Answer: C

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22. The contraction of pupil of the eye in the presence of bright light is an example of:

A. Voluntary reflex

B. Spinal reflex

C. Cerebral reflex

D. Adrenal reflex

Answer: C

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23. Third ventricle of brain is also known as

A. Metacoel

B. Rhinocoel

C. Paracoel

D. Diacoel

Answer: D

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24. The number of cranial nerves in a mammal including man is

A. 10

B. 12

C. 24

D. 36

Answer: B

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25. Purely motor nerve is

A. Optic

B. Abducens

C. Palatinus

D. Ophthalmic

Answer: C

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26. The second cranial nerve is

A. Optic

B. Trigeminal

C. Olfactory

D. Abducens

Answer: B

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27. The cranial nerves which can regulate heart beat

A. X

B. IX

C. VIII

D. VII

Answer: A

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28. The brain by origin is

A. Endodermal

B. Photic

C. Ectodermal

D. Mesodermal

Answer: A

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29. Second cranial nerve supplies

A. Retina and lens

B. Retina and iris

C. Ciliary muscles

D. Retina only

Answer: C

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30. Nervous band connecting the two cerebral hemispheres in

A. Corpus albicans

B. Corpus callosum

C. Corpus striatum

D. Corpus spongiosum

Answer: D

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31. Cerebrum is located in which part of the brain

A. Lower side

B. Extension of brain

C. Forefront

D. None of the above

Answer: B

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32. Ivan Pavlov performed experiments on

A. Simple reflexes

B. Conditional reflexes

C. Cardiac reflexes

D. Origin of life

Answer: B

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33. Brain is dependent on blood supply for

A. O_2 and ATP

B. O_2 and electrolytes

C. O_2 and glucose

D. ATP and glucose

Answer: C

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34. Root of cerebrum is called

A. Pons

B. Epithalamus

C. Choroid plexus

D. Centrocoel

Answer: C

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35. Myelin sheath is formed by

A. Node of Ranvier

B. Muscle cells

C. Axon

D. Schwann cells

Answer: D

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36. How many laminae are present in the grey matter of spinal cord.

A. Four

B. Six

C. Eight

D. Ten

Answer: C

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37. Which of the following is not related to the autonomic nervous system

A. Memory and learning

B. Digestion

C. Peristalsis

D. Excretion

Answer: D

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38. Which one becomes a bridge between nervous system and endocrine system?

A. Thalamus

B. Hypothalamus

C. Limbic system

D. Parietal lobe

Answer: A

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39. Which of the following is not a eye ball layer?

A. Choroid

B. Dermis

C. Retina

D. Sclerotic

Answer: B

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40. In human eye, the blind spot contains

A. Rods

B. Cones

C. Both rods and cones

D. Neither rod nor cones

Answer: C

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41. Concave lens is employed to correct

A. Presbyopia

B. Hypermetropia

C. Cataract

D. Myopia

Answer: A

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42. Area of the retina having the maximum number of cones is

A. Conjunctiva

B. Iris

C. Blind spot

D. Fovea centralis

Answer: A

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43. Which of the following is devoid of blood supply?

A. Retina

B. Choroid

C. Cornea

D. Sclerotic

Answer: D

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44. The membrane labyrinth of internal ear contains a fluid called

A. Perilymph

B. Haemolymph

C. Lymph

D. Endolymph

Answer: C

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45. Eye lens is

A. Biconcave

B. Concave

C. Convex

D. Biconvex

Answer: B

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46. The part of eye which controls the amount of light entering in is

A. Iris

B. Cornea

C. Ciliary body

D. Suspensory ligament

Answer: D

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47. Essential sensory part of mammalian ear is

A. Membranous labyrinth

B. Eardrum

C. Pinna

D. Auditory ossicles

Answer: D

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48. Organ of corti is concerned with the sense of :

A. Taste

B. Smell

C. Hearing

D. Equilibrium

Answer: C

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49. Focal length of eye lens is changed by

A. Pupil

B. Iris

C. Cornea

D. Ciliary body

Answer: D

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50. Bony labyrinth of ear contians a fluid known as

A. Endolymph

B. Perilymph

C. Humour

D. Synovial fluid

Answer: D

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51. Eustachian tube is present in

A. Nose

B. Ear

C. Eye

D. Skin

Answer: A

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52. A serious eye defect which can lead to blindness is

A. Myopia

B. Hypermetropia

C. Presbyopia

D. Glaucoma

Answer: A

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53. Which one has the shortest duration of contraction?

A. Eye lids

B. Jaw

C. Heart

D. Intestine

Answer: B

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54. The colour vision in mammals is due to

A. Lens

B. Cone cells

C. Cornea

D. Rod cells

Answer: D

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55. Maximum refraction of light takes place at :

A. Corneal

B. Lens

C. Iris

D. Aqueous humour

Answer: A

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56. Pacinian corpuscles detect

A. Temperature

B. Light

C. Sound

D. Pressure

Answer: A

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57. Iodopsin occurs in

A. Iris

B. Rods

C. Cones

D. Lens

Answer: D

View Text Solution

58. Bacterial killing protein present in human tears is

A. opsin

B. Lysozyme

C. Transduction

D. Retinene

Answer:

View Text Solution

59. Pecten, a comb-like structure occurs in the eye of

A. Fishes

B. Birds

C. Mammals

D. Frog

Answer:

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60. Which one is present in rods and is useful for night vision?

A. Rhodopsin

B. Vitamin C

C. Melanin

D. Vitamin K

Answer:

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61. Tongue has

A. Baroreceptors

B. Olfacto receptors

C. Gustato receptors

D. Tango receptors

Answer:

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62. A cell (or group of cells) in a sense organ which is sensitive to a particular type of stimulus is called:

A. Interceptor

B. Effector

C. Receptor

D. Acceptor

Answer:

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63. Which of the following helps in maintaining posture and balance of the human body?

A. Cerebellum

B. Cerebrum

C. Medulla

D. Pons

Answer:

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64. The number of pairs of nerves which arises from the spinal cord is:

A. 21

B. 31

C. 41

D. 51

Answer:

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65. Cerbellmum, medulla and pons are the parts of:

A. Mid-brain

B. Hind-brain

C. Forebraindikali

D. Spinal cord

Answer:

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66. The involuntary actions in the body are controlled by:

A. Medulla in forebrain

B. Medulla in hindbrain

C. Medulla in spinal cord

D. Medulla in midbrain

Answer:

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Olympiad And Ntse Level Exercises

1. Praveen is attempting the play cards (of different colours) sorting task. He starts off sorting the cards according to their colours, but when the experimenter changes the sorting criterion, Praveen starts sorting the cards instead according to the shapes on the cards. Praveen fails to detect this shift in strategy, so he continues to sort the cards by colour. Praveen has most likely suffered damage to which of the following region?

A. Parietal lobe

B. Frontal lobe

C. Occipital lobe

D. Temporal lobe

Answer:

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2. While walking home from night class, a college student was frightened by a barking dog. After walking to another block, she

notices her breathing and heart rate have slowed down to normal levels. Which branch of her nervous system is responsible for these changes?

A. The sympathetic nervous system

B. The parasympathetic nervous system

C. The afferent nervous system

D. The somatic nervous system

Answer:

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3. Semicircular canals in the ear of vertebrate are responsible for

A. detection of change of atmospheric pressure

B. orientation of animal with regard to sun

C. maintenance of balance when the organism is in motion

D. regulation of speed of animal

Answer:

View Text Solution

4. In mammals, the autonomic system includes

A. sympathetic and parasympathetic nerves

B. cranial and spinal nerves

C. brain and spinal cord

D. medullated and nonmedullated nerves

Answer:

View Text Solution

5. The appetite and satiety centres in the brain are located in the region of the

A. hypothalamus

B. cerebral hemispheres

C. medulla oblongata

D. cerebellum

Answer:

View Text Solution

6. In a person who uses concave lenses, if he removes his spectacles, then in his eyes, image of the object will be formed

A. behind retina

B. on fovea centralis

C. in front of retina

D. far from retina

Answer:

View Text Solution

7. A person going upto $10,000$ feet high in a hot air ballon may develop severe pain in the ear due to

A. blocked Eustachian tube

B. rupture of fenestra rotunda

C. endolymph getting into semicircular canals

D. fear of great height

Answer:

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8. In the following question, a statement of Assertion is given followed by corresponding statement of Reason.

Assertion: Diabetes insipidus is marked by excessive urination and too much thirst of water.

Reason: ADH is secreted by posterior lobe of pituitary.

Mark your response from the following options.

A. Both Assertion and Reason are true and Reason is the correct explanation of 'Assertion

B. Both Assertion and Reason are true and Reason is not the correct explanation of 'Assertion

C. Assertion is true but Reason is false.

D. Assertion is false but Reason is true.

Answer:

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9. Match the following columns and identify the option which shows the correct matching.

Column I	Column II
A. Hypothalamic	1. Pituitary gland hormone
B. Thyrotropin	2. Adrenal cortex (TSH)
C. Corticotropin	3. Thyroid
D. Gonadotropins	4. Gonads (LH, FHS)

A. A-3,B-4,C-1,D-2

B. A-1,B-3,C-2,D-4

C. A-4,B-3,C-2,D-1

D. A-2,B-3,C-1,D-4

Answer:

View Text Solution

10. Which of these is wrong statement/s?

(i)

(ii) .

(iii)

A. Neurotransmitter jumps from one junction to another.

B. After signal transmittance post-synaptic membrane is destroyed

C. Neurotransmitter is permanently destroyed after the transmission of nerve impulse has taken place

D. None of the above

Answer:

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Challenging Exercise

1. Cerebral palsy is a group of disorders that affects body movement and muscle co-ordination. It is caused by damage to, or malformation of, the brain during development in the womb or in the first few years of life. The effects of cerebral palsy vary widely, from slight awkwardness of movement or hand control to eating difficulties, poor bladder and bowel control and breathing

problems. Which area(s) of the brain are most likely affected? Explain your answer.

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2. If a man with a severed corpus callosum were asked to view a photograph of a familiar face, first in his left field of vision and then in his right field. Why would it be difficult for him to put a name to the face in either field?

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