REVIEW QUESTIONS PAGE: 135

A. MULTIPLE CHOICE TYPE
(Select the most appropriate option in each case).
1. The insulating sheath covering the axon is called
(a) plasmalemma **(b) neurolemma**
(c) dura mater **(d) pia mater**
Solution:-
(b) neurolemma

2. Which one of the following pairs of brain part and its function is not correctly matched?
(a) Cerebrum - memory
(b) Cerebellum - balance of body
(c) Medulla oblongata - controls activities of internal organs
(d) Pons - consciousness
Solution:-
(d) Pons – consciousness

3. A mixed nerve is one which
(a) Carries sensation from 2 or more different sense organs
(b) Contains both sensory and motor fibres
(c) Has a common root but branches into two or more nerves to different organs
(d) Has two or more roots from different parts of brain
Solution:-
(b) Contains both sensory and motor fibres

4. Reflex action is controlled by
(a) brain **(b) spinal cord**
(c) autonomic **(d) peripheral nervous system**
Solution:-
(b) spinal cord

B. VERY SHORT ANSWER TYPE
1. Name the following:
(a) The fluid that is present inside and outside the brain.
Solution:-

Cerebrospinal fluid that is present inside and outside the brain.

(b) The junction between two nerve cells.
Solution:-
Synapse is the junction between two nerve cells.

(c) The part of the brain which is concerned with memory.
Solution:-
Cerebrum is the part of the brain which is concerned with memory.

(d) The part of the human brain which controls body temperature.
Solution:-
Hypothalamus is the part of the human brain which controls body temperature.

2. Note the relationship between the first two words and suggest the suitable word/words for the fourth place.
(a) Stimulus: Receptor:: Impulse:_____
Solution:-
Stimulus: Receptor:: Impulse: Effectors

(b) Cerebrum: Diencephalon:: Cerebellum:_____
Solution:-
Cerebrum: Diencephalon:: Cerebellum: Medulla oblongata

(c) Receptor: Sensory nerve:: Motor nerve:_____
Solution:-
Receptor: Sensory nerve:: Motor nerve: Effector

3. Complete the following statements by choosing the correct alternative from the choices given in brackets:
(a) The dorsal root ganglion of the spinal cord contains cell bodies of (motor/ sensory/ intermediate) neurons.
Solution:-
The dorsal root ganglion of the spinal cord contains cell bodies of sensory neurons.

(b) Cerebellum is the part of the brain which is responsible for
(i) Conducting reflexes in the body

(ii) Maintaining posture and equilibrium
(iii) Controlling thinking, memory and reasoning.
Solution:-
Cerebellum is the part of the brain which is responsible for maintaining posture and equilibrium.

C. SHORT ANSWER TYPE
1. Mention, where in human body are the following located and state their main functions:
(a) Corpus callosum
Solution:-
Corpus callosum is located in the brain. Its main function is to transfer information from one hemisphere to the other.

(b) Central canal
Solution:-
Central canal is located in center of the spinal cord. Which runs the entire length and is continuous with the cavities of the brain. It is also filled with cerebrospinal fluid which acts as a shock proof cushion and forms a medium for the exchange of food materials, waste products, and respiratory gases with neurons.

2. State whether the following statements are true (T) or false (F).
(a) The main component of the white matter of the brain is perikaryon.
Solution:-
False

(b) The arachnoid layer fits closely inside the pia mater.
Solution:-
False

(c) A double chain of ganglia, one on each side of the nerve cord belongs to the spinal cord.
Solution:-
True

(d) Dura mater is the outermost layer of the meninges.
Solution:-

True

3. Differentiate between the following pairs with reference to the aspects in brackets.

(a) Cerebrum and cerebellum (function)

Solution:-

Cerebrum	Cerebellum
The highly developed cortex enables us to think, reason out, invent, plan and memorise. Overall, the cerebrum is the seat of intelligence, consciousness and will-power. It controls all voluntary actions.	The main function of the cerebellum is to maintain balance of the body and coordinate muscular activity.

(b) Sympathetic nervous system and parasympathetic nervous system (overall effect on body)

Solution:-

Sympathetic nervous system	Parasympathetic nervous system
Sympathetic nervous system prepares the body for violent action against abnormal conditions.	The parasympathetic nervous system is more concerned with re-establishing normal conditions after the violent act is over.

(c) Sensory nerve and motor nerve (direction of impulse carried)

Solution:-

Sensory nerve	Motor nerve
It is the neuron in the spinal cord that receives nerve impulse through its axon/terminal ending which are in contact with a receptor cell.	It carries impulse generated by the association neuron in the CNS to the effector organ (muscle and gland).

(d) Medulla oblongata and cerebellum (function)

Solution:-

Medulla oblongata	Cerebellum
Its function is to control the activities of the internal organs and other involuntary actions.	The main function of the cerebellum is to maintain balance of the body and coordinate muscular activity.

(e) Cerebrum and spinal cord (arrangement of cytons and exons of neurons)

Solution:-

Cerebrum	Spinal cord
The highly developed cortex (gray matter) enables us to think, reason out, invent, plan and memorise.	The grey matter containing cytons lies in the medullary region i.e. inner side while the white matter containing axons lies in the cortex i.e. the outer region.

4. Given below are two structures, write their special functional activity.
(a) Cerebellum and _____.
Solution:-
The main function of the cerebellum is to maintain balance of the body and coordinate muscular activity.

(b) Myelin sheath and _____.
Solution:-
Myelin sheath acts like an insulation and prevents mixing of impulses in the adjacent axons.

5. State the functions of the following:
(a) Synapse
Solution:-
The function of the synapse is to transfer electric activity (information) from one cell to another. The transfer can be from nerve to nerve (neuro-neuro), or nerve to muscle (neuro-myo).

(b) Association neuron
Solution:-
Association neurons carry impulses from the motor neuron to the Central Nervous System.

(c) Medullary sheath
Solution:-
A medullary sheath is a protective covering surrounding and insulating certain nerve fibers.

(d) Medulla oblongata
Solution:-

Its function is to control the activities of the internal organs and other involuntary actions.

(e) Cerebellum
Solution:-
The main function of the cerebellum is to maintain balance of the body and coordinate muscular activity.

(f) Cerebrospinal fluid
Solution:-
Which acts as a shock proof cushion and forms a medium for the exchange of food materials, waste products, and respiratory gases with neurons.

6. Explain the following terms:
(a) Motor nerve
Solution:-
It carries impulse generated by the association neuron in the CNS to the effector organ (muscle and gland).

(b) Autonomic nervous system
Solution:-
Autonomic nerves system is strongly influenced by emotion such as grief, anger, fear, sexual stimulation, etc. High blood pressure, stomach ulcers and some other troubles may arise due to long continued emotional stress.

(c) Conditioned reflex
Solution:-
Conditioned reflex is one which develops during lifetime due to experience or learning. For example, what you experience simply at the sight or by the smell of a familiar tasty food resulting in watering of your mouth. This means that if you have not eaten that food earlier, the response would not occur.

(d) Association neuron
Solution:-
Association neurons carry impulses from the motor neuron to the Central Nervous System.

(e) Gray matter
Solution:-
The outer portion (cortex) of the cerebrum contains cell bodies of the neurons and, being grayish in colour, is called the gray matter.

7. Rearrange the following in correct sequence pertaining to what is given within brackets at the end.
(a) Effector - Sensory neuron - Receptor - Motor neuron - Stimulus - Central nervous system - Response (Reflex arc)
Solution:-
Stimulus - Receptor - Sensory neuron - Central nervous system - Motor neuron - Effector - Response

(b) Repolarization - Depolarisation - Resting (polarized) (during conduction of nerve impulse through a nerve fibre)
Solution:-
Resting - Depolarization - Repolarization

(c) Axon endings - Nucleus - Dendrites - Axon - Perikaryon - Dendron (neuron structure)
Solution:-
Dendrites - Dendron - Perikaryon - Nucleus - Axon - Axon endings

(d) Diencephalon - Cerebellum - Medulla oblongata - Pons - Cerebrum - Mid brain (sequence of parts of human brain)
Solution:-
Cerebrum - Diencephalon - Mid-brain - Cerebellum - Pons - Medulla oblongata

D. LONG ANSWER TYPE
1. (a) What is meant by reflex action?
Solution:-
It is an automatic/quick/immediate, involuntary action in the body brought about by a stimulus.

(b) State whether the following are simple reflexes, conditioned reflexes or neither of the two.

(i) Sneezing……..
Solution:-
Simple

(ii) Blushing……..
Solution:-
Simple

(iii) Contraction of eye pupil……
Solution:-
Simple

(iv) Lifting up a book
Solution:-
Conditioned

(v) Knitting without looking
Solution:-
Conditioned

(vi) Sudden application of brakes of the cycle on sighting an obstacle in front
Solution:-
Conditioned

2. What are the advantages of having a nervous system?
Solution:-
(a) Nervous system helps our various body parts to communicate with each other.
(b) Nervous system Keeps us informed about the outside world through sense organs..
(c) It enables us to quickly detect a stimulus and then communicate and co-ordinate with external as well as internal environment to make an appropriate response.
(d) It allows to carry information generated from one part of the body to other.

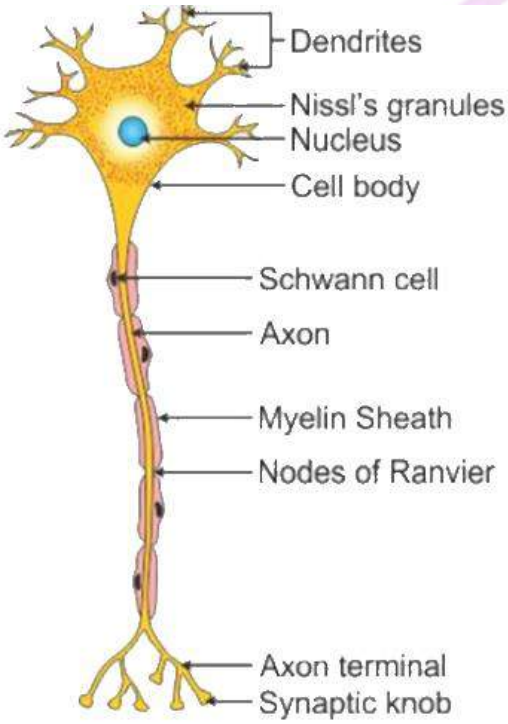
3. Why is the spinal cord and the brain referred to as the central nervous system?
Solution:-
The spinal cord and the brain referred to as the central nervous system because, the brain is protected by the skull (the cranial cavity) and the spinal cord travels from the back of the brain, down the center of the spine, stopping in the lumbar region of the

lower back. The central nervous system controls our thoughts, movements, emotions, and desires. It also controls our breathing, heart rate, the release of some hormones, body temperature, and much more.

4. What is the difference between reflex action and voluntary action?
Solution:-

Reflex action	Voluntary action
1. Initiated by some stimulus (touch, pain, pressure, heat, light)	1. Initiated by a willing thought.
2. Mainly self-protective due to environment.	2. Fulfilment of a desired goal.
3. Commands originate mostly in the spinal cord and autonomic nervous system and a few in the brain as well.	3. Commands originate in brain.
4. Involve muscles and glands.	4. Involve only muscles.

5. Draw a labelled diagram of a myelinated neuron.
Solution:-



6. During a while watching a scary movie, mention the effects on the following organs by the autonomous nervous system, in the table given below: (one has been done for you as an example).

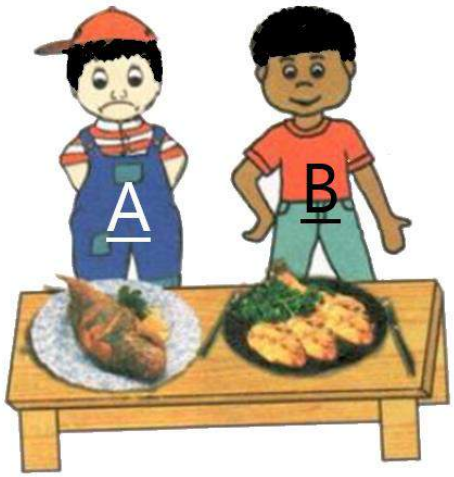
Organ	Sympathetic System	Parasympathetic System
e.g. Lungs	**Dilates bronchi and bronchioles**	**Constricts bronchi and bronchioles**
1. Heart		
2. Pupil of the eye		
3. Salivary gland		

Solution:-

Organ	Sympathetic System	Parasympathetic System
e.g. Lungs	Dilates bronchi and bronchioles	Constricts bronchi and bronchioles
1. Heart	Accelerate heartbeat	Retards heartbeat
2. Pupil of the eye	Dilates	Constricts
3. Salivary gland	Inhibits the secretion of saliva causing the drying of the mouth	Stimulates the release of saliva

E. STRUCTURED/APPLICATION/SKILL TYPE

1. Two hungry boys (A and B) enter a restaurant and find a table decorated as shown alongside:



Boy B starts salivating but not A. Explain the reason for this difference.

Solution:-

Salivation can occur as a natural reflex also. Salivation starts flowing down when you chew or eat food. But in the above situation of salvation, the sight or the smell of food was enough for the response. There, your brain actually remembered the taste of the food and worked in an unconscious way. Boy B started salivating because he must have tasted that food previously unlike boy A.

2. Given below are a few situations. What effective change will occur in the organ/body part mentioned and which part (sympathetic or parasympathetic) of the autonomic nervous system brings it about?

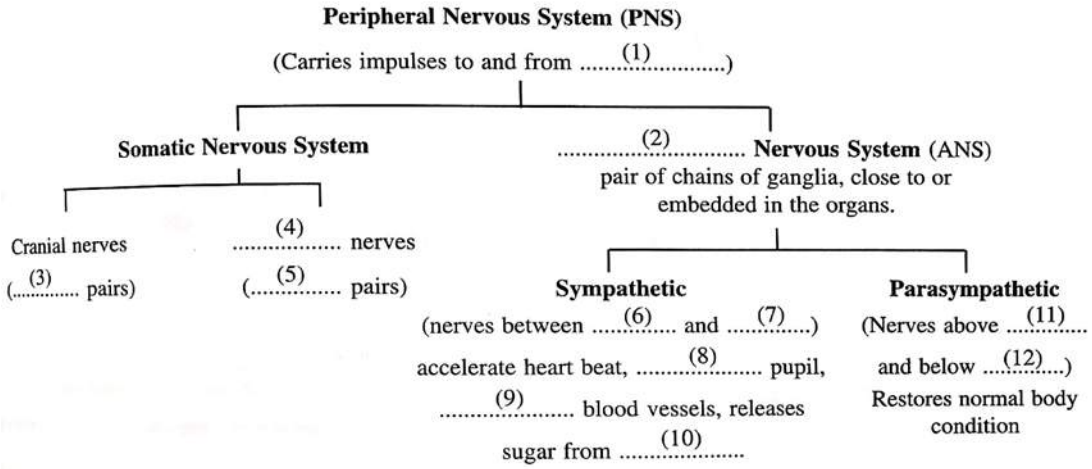
Situation	**Organ/body part**	**Change/action**	**Part of autonomic nervous system involved**
1. You have entered a dark room	**Eye**	Pupil dilates	Sympathetic
2. Your body is consuming lot of glucose while running a race	**Liver**	Glycogen is converted into glucose in liver	Sympathetic
3. You are chewing a tasty food	**Salivary gland**	Salivation increases	Parasympathetic
4. You are running a race	**Adrenal gland**	Release of adrenaline and noradrenaline increases	Sympathetic
5. You are retiring to bed for sleep	**Heart**	Heart rate slows down	Parasympathetic
6. You are shivering in intense cold	**Body hairs**	Hair raised	Sympathetic

Solution:-

Situation	**Organ/body part**	**Change/action**	**Part of autonomic nervous system involved**
1. You have entered a dark room	Eye	Pupil dilates	Sympathetic
2. Your body is consuming lot of glucose	Liver	Glycogen is converted into	Sympathetic

while running a race		glucose in liver	
3. You are chewing a tasty food	Salivary gland	Salivation increases	Parasympathetic
4. You are running a race	Adrenal gland	Release of adrenaline and noradrenaline increases	Sympathetic
5. You are retiring to bed for sleep	Heart	Heart rate slows down	Parasympathetic
6. You are shivering in intense cold	Body hairs	Hair raised	Sympathetic

3. Given below is the partially incomplete scheme of the components of peripheral nervous system. Fill up the blanks numbered (1)-(12):



Solution:-

1. Central Nervous System
2. Autonomic
3. 12
4. Spinal
5. 31
6. Neck
7. Waist
8. Dilates
9. Constricts

10. Liver
11. Neck
12. Sacrun