CHAPTER-10-NEURAL CONTROL AND COORDINATION

Evaluation

Choose the followings:

1 Which structure in the ear converts pressure waves to action potentials?

a. Tympanic membrane **b. Organ of Corti**

c. Oval window d. Semicircular canal

2. Which of the following pairings is correct?

a. Sensory nerve – afferent

b. Motor nerve - afferent

c. Sensory nerve – ventral

d. Motor nerve – dorsal

3. During synaptic transmission of nerve impulse, neurotransmitter (P) is released from synaptic vesicles by the action of ions (Q). Choose the correct P and Q.

a. P = Acetylcholine, Q = Ca++

b. P = Acetylcholine, Q = Na+

c. P = GABA, Q=Na+

d. P = Cholinesterase, Q = Ca++

4. 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 bright light intensities

5. Assertion: The imbalance in concentration of Na+, K+ andproteins generates action potential.
Reason: To maintain the unequal distribution of Na+ and K+, the neurons use electrical energy.

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

b. Both Assertion and Reason are true but the Reason is not the correct explanations of Assertion.

c. Assertion is true, but Reason is false.

d. Both Assertion and Reason are false.

6. Which part of the human brain is concerned with the regulation of body temperature?

a. Cerebellum b. Cerebrum c. Medulla oblongata **d. Hypothalamus**

7. The respiratory centre is present in the

a. Medulla oblongata b. Hypothalamus c. Cerebellum d. Thalamus

8. Match the following human spinal nerves in column I with their respective number in column II and choose the correct option

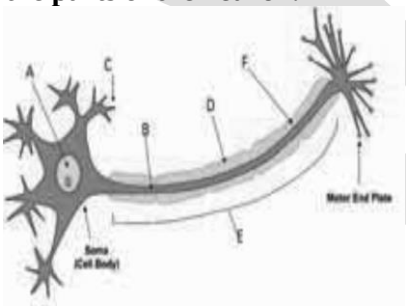
column I	column II
P. Cervical nerves	i. 5 pairs
Q. Thoracic nerve	ii. 1 pair
R. Lumbar nerve	iii. 12 pair
S. Coccygeal nerve	iv. 8 pair

a. (P-iv),(Q-iii),(R-i),(S-ii)

b. (P-iii), (Q-i), (R-ii), (S-iv)

c. (P-iv),(Q-i),(R-ii),(S-iii)
d. (P-ii), (Q-iv), (R-i), (S-iii)
9. Which of the following cranial nerve controls the movement of eye ball ?
a. trochlear nerve **b. optic nerve**
c. Olfactory nerve d. vagus nerve.
10. The abundant intracellular cation is
a. H+ b. K+ c. Na+ **d. Ca++**
11. Which of the following statements is wrong regarding conduction of nerve impulse?
a. In a resting neuron, the axonal membrane is more permeable to K+ ions and nearly impermeable to Na+ ions.
b. Fluid outside the axon has a high concentration of Na+ ions and low concentration of K+, in a resting neuron.
c. Ionic gradient s are maintained by Na+ K+ pumps across the resting membrane, which transport 3Na ions outwards for 2K+ into the cell.
d. A neuron is polarized only when the outer surface of the axonal membrane possess a negative a charge and its inner surface is positively charged.
12. All of the following are associated with the myeline sheath except
a. Faster conduction of nerve impulses
b. Nodes of Ranvier forming gaps along the axon
c. Increased energy output for nerve impulse conduction
d. Saltatory conduction of action potential
13. Several statements are given here in reference to cone cells which of the following option indicates all correct statements for cone cells ?
Statements
(i) Cone cells are less sensitive in bright light than Rod cells
(ii) They are responsible for colour vision
(iii) Erythropsin is a photo pigment which is sensitive to red colour light
(iv) They are present in fovea of retina
a. (iii),(ii) and(i) **b. (ii) ,(iii)and(iv)**
c. (i), (iii)and(iv) d. (i), (ii)and(iv)
14. Which of the following statement concerning the somatic division of the peripheral neural system is incorrect?
a. Its pathways innervate skeletal muscles
b. Its pathways are usually voluntary
c. Some of its pathways are referred to as reflex arcs
d. Its pathways always involve four neurons
15. When the potential across the axon membrane is more negative than the normal resting potential, the neuron is said to be in a state of
a. Depolarization **b. Hyperpolarization** c. Repolarization d. Hypopolarization
16. Why is the blind spot called so?
The optic nerves and the retinal blood vessels enter the eye slightly below the posterior pole, which is devoid of photo receptors; hence this region is called **blind spot.**
17. Sam's optometrist tells him that his intraocular pressure is high. What is this condition called and which fluid does it involve?
1.Aqueous humour supplies nutrients and oxygen to the lens, cornea and some retinal cells.
2.The aqueous humor is produced and drained at the same rate, maintaining a constant intra ocular pressure of about 16mmHg.
3.Any block in the canal of schlemm increases the infra ocular pressure of queous humor and leads to 'Glaucoma' where the optic nerve and the retina are compressed due to pressure.

18. Why are we getting running nose while crying?
That's because their bodies react to these things like they're germs.
You're crying: When you cry, tears come out of the tear glands(Lacremal glands) under your eyelids and drain through the tear ducts that empty into yournose.
Tears mix with mucus there and your nose runs.
19. The action potential occurs in response to a threshold stimulus; but not at sub threshold stimuli. What is the name of the principle involved?
All or None principle
20. Pleasant smell of food urged Ravi to rush into the kitchen. Name the parts of the brain involved in the identification of food and emotional responses to odour.
*Fore Brain It comprises the following regions:Cerebrum and Diencephalon.
*Hypothalamus forms the floor of the diencephalon.
*The hypothalamus contains a pair of small rounded body called mammillary bodies that are involved in olfactory reflexes and emotional responses to odour.
*It also contains a group of neurosecretory cells which secrete the hypothalamic hormones.
21. Cornea transplant in humans is almost never rejected. State the reason.
The cornea is the only tissue in the body that can be transplanted from one person to another with little or no possibility of rejection. This is because cornea does not have blood vessels.
(1) It is a non living layer
(2) Its cells are least penetrable by bacteria
(3) It has no blood supply
(4) It is composed of enucleated cells
22. At the end of repolarization, the nerve membrane gets hyperpolarized.Why?
*The reversal of membrane potential inside the axolemma to negative occurs due to the efflux of K+ ions. This is called **Repolarisation**.
*If repolarization becomes more negative than the resting potential -70 mV to about -90 mV, it is called **Hyperpolarization**.
*During this, K+ ion gates are more permeable to K+ even after reaching the threshold level as it closes slowly; hencecalled **Lazy gates**.
*The membrane potential returns to its original **resting state** when K+ ion channels close completely. During hyperpolarization the Na+ voltage gate remains closed.
23. Label the parts of the neuron.



A.Nucleus
B.Myelin sheath
C.Dentrites
D.Nucleus
E.Axon
F.Node of Ranvier
24. The choroid plexus secretes cerebrospinal fluid. List the function of it.
Choroid plexus is a network of blood capillaries found in the roof of the ventricles and forms **cerebro spinal fluid (CSF)** from the blood.

FUNCTIONS:

1.CSF provides buoyancy to the CNS structures;
2.CSF acts as a shock absorber for the brain and spinal cord;
3. it nourishes the brain cells by transporting constant supply of food and oxygen; 4.it carries harmful metabolic wastes from the brain to the blood; and maintains
a constant pressure inside the cranial vessels.

25. What is the ANS controlling centre? Name the parts that are supplied by the ANS.

*The autonomic neural system is auto functioning and self governed.
*It is a part of peripheral neural system that innervates smooth muscles, glands and cardiac muscle. This system controls and coordinates the involuntary activities of various organs.
*ANS controlling centre is in the hypothalamus.

26. Why the limbic system is called the emotional brain? Name the parts of it.

*The inner part of the cerebral hemisphere constitutes the limbic system.
*The main components of limbic system are **olfactory bulbs, cingulated gyrus, mammillary body, amygdala, hippocampus and hypothalamus.**
*The limbic system is called 'emotional brain' because it plays a primary role in the regulation of pleasure, pain, anger, fear, sexual feeling and affection.
*The hippocampus and amygdala also play a role in memory.

27. Classify receptors based on type of stimuli.

Table: 10.5 Types of receptors

Receptors	Stimulus	Effector organs
Mechano receptors	Pressure and vibration	Mechano receptors are present in the cochlea of the inner ear and the semi circular canal and utriculus
Chemoreceptors	Chemicals	Taste buds in the tongue and nasal epithelium
Thermoreceptors	Temperature	Skin
Photoreceptors	Light	Rod and cone cells of the retina in the eye

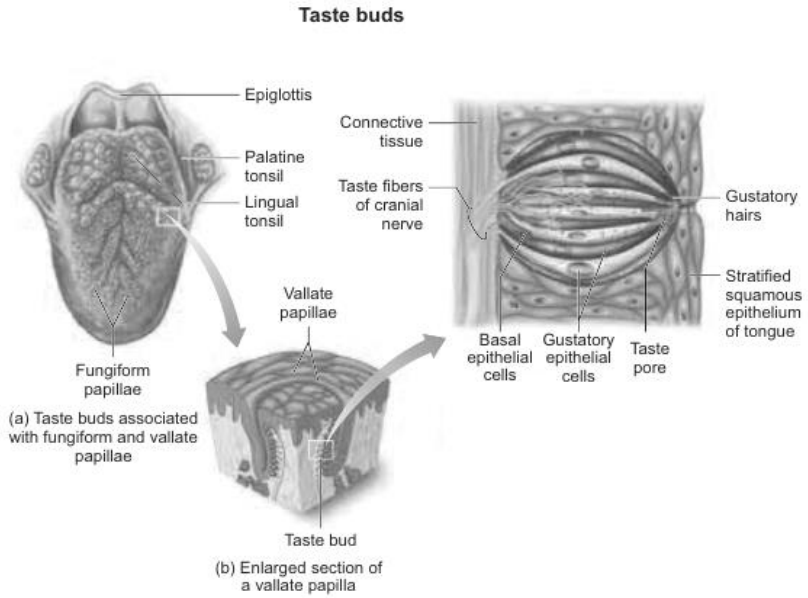
28. Name the first five cranial nerves,their nature and their functions.

No.	Cranial nerves	Nature of nerve	Function
I	Olfactory nerve	Sensory	Sense of smell
II	Optic nerves	Sensory	Sense of sight
III	Oculomotor nerves	Motor	Movement of the eye
IV	Trochlear nerve	Motor	Rotation of the eye ball
V	Trigeminal nerve	Sensory and motor (mixed)	Functioning of facial parts

29. The sense of taste is considered to be the most pleasurable of all senses.
Describe the structure of the receptor involved with a diagram.

***Gustatory receptor:** The sense of taste is considered to be the most pleasurable of all senses. The tongue is provided with many small projections called **papillae** which give the tongue an abrasive feel.
*Taste buds are located mainly on the papillae which are scattered over the entire tongue surface.
*Most taste buds are seen on the tongue few are scattered on the soft palate, inner surface of the cheeks, pharynx and epiglottis of the larynx.

*Taste budsare flask-shaped and consist of 50 – 100 epithelial cells of two major types.



***Gustatory epithelial cells** (taste cells) and **Basal epithelial cells** (Repairing cells**)** Long microvilli called **gustatory hairs** project from the tip of the gustatory cells and extends through a taste pore to the surface of the epithelium where they are The taste bud cells are subjected to huge amounts of friction, because of their location and are routinely burned by hot foods. These are the most dynamic cells in the body and are replaced every seven to ten days. bathed by saliva.

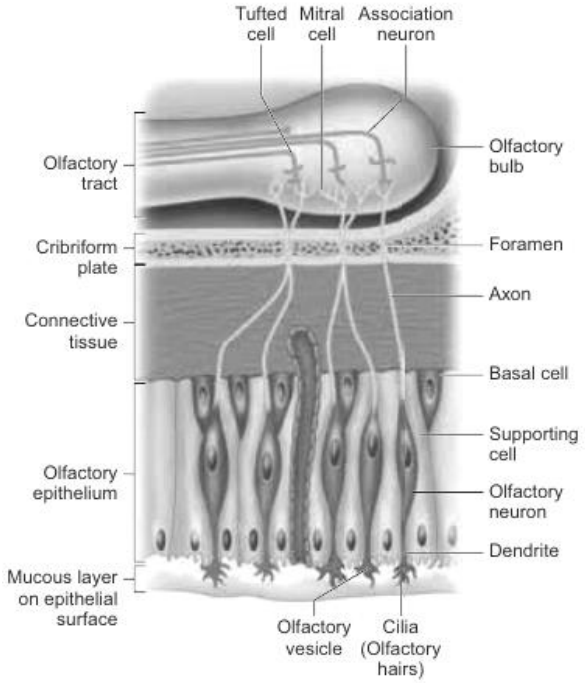
*Gustatory hairs are the sensitive portion of the gustatory cells and they have sensory dendrites which send the signal to the brain.

*The basal cells that act as stem cells, divide and differentiate into new gustatory cells

30. Describe the structures of olfactory receptors?

*The receptors for taste and smell are the chemoreceptors. The smell receptors are excited by air borne chemicals that dissolve in fluids.

*The yellow coloured patches of olfactory epithelium form the olfactory organs that are located on the roof of the nasal cavity. The olfactory epithelium is covered by a thin coat of mucus layer below and olfactory glands bounded connective tissues, above.



*It contains three types of cells**: supporting cells, Basal cells** and millions of pin shaped **olfactory receptor cells** (which are unusual bipolar cells).

*The olfactory glands and the supporting cells secrete the mucus. The unmyelinated axons of the olfactory receptor cells are gathered to form the filaments of olfactory nerve [cranial nerve I] which synapse with cells of olfactory bulb.

*The impulse, through the olfactory nerves, is transmitted to the frontal lobe of the brain for identification of smell and the limbic system for the emotional responses to odour.

CHAPTER-11 CHEMICAL CO-ORDINATION AND INTEGRATION

Evaluation

1. The maintenance of constant internal environment is referred as
a. Regulation **b. homeostasis** c. co-ordination d. hormonal control
2. Which of the following are exclusive endocrine glands?
a. Thymus and testis b. adrenal and ovary
c. parathyroid and adrenal d. pancreas and parathyroid
3. Which of the following hormone is not secreted under the influence of pituitary gland?
a. thyroxine **b. insulin** c. oestrogen d. glucocorticoids
4. Spermatogenesis in mammalian testes is controlled by
a. Luteinising hormone **b. Follicle stimulating hormone**
c. FSH and prolactin d. GH and prolactin
5. Serum calcium level is regulated by
a. Thyroxine b. FSH
c. Pancreas **d. Thyroid and parathyroid**
6. Iodised salt is essential to prevent
a. rickets b. scurvy **c. goitre** d. acromegaly
7. Which of the following gland is related with immunity?
a. Pineal gland b. adrenal gland **c. thymus** d. parathyroid gland
8. Which of the following statement about sex hormones is correct?
a. Testosterone is produced by Leydig cells under the influence of luteinizing hormone