

RECEPTION, RESPONSE & CO- ORDINATION

1. **Structural difference**- the cell body in motor neurone is terminal (at the end) and inside the central nervous system. While the cell body in sensory neuron is not terminal but has axon on both end i.e. bipolar.

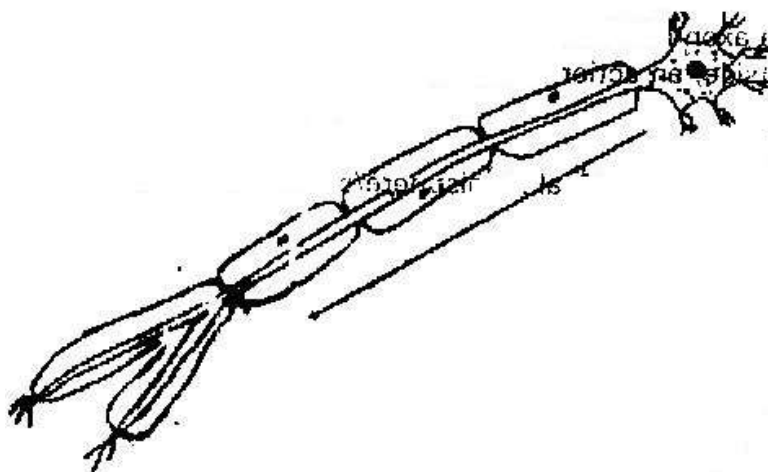
Functional differences – motor neurone carries impulses from CNS to the effectors i.e. muscles, while sensory neurons carry impulse for receptor to CNS.

2.

3.

Hormone	Site of production	Function
Oestrogen	Ovary	Initiate and control development of secondary sexual characteristics
Aldosterone	Aldrenal gland	Mineral reabsorption

(i)



(ii) P- Protection/ insulation

Q- Impulses transmitted/depolarization is faster.

4. (a)

Adaptation	Function
Conjunctiva - An epithelium colourless	Protects eyeball
Cornea: Transparent/curved	Allow light/ refract light entering the eye
Aqueous/vitreous: clear	Allow light to pass through/ refract light. Maintain the shape of the eye
Iris. Opaque and contractile	Controls light intensity/amount of light entering the eye.
Ciliary muscle/ body contractile	Control curvature of lens, secretes humour
Suspensory ligaments: are fibrous	Hold lens in position
Lens is transparent; lens is biconvex	To allow light to go though/to refract light/ to focus light.
Retina- contain light sensitive cells	Where an image is formed which perceive light.
Cones: contain pigments	For colour vision/ bright light/ light of high intensity
Rods contain pigments	For dim light vision

Forea centralis: High concentration of cones	For accurate vision
Choroid: Layer has blood vessels	For nutrition and pigments. Reduce light reflection and absorb stray light
Sclera- Tough/ non elastic or fibrous	Gives eye shape and protects
Optic nerve	Contain sensory neurones for transmitting impulses from retina to brain.

(b)

Defect	Correct
Myopia/ short sightedness	Biconcave/diverging lenses
Hypermetropia/long sightedness	Biconvex/ converging lenses
Astigmatism	Use of cylindrical lenses with combined curvature

5. When an impulse passes along the axon, the membrane of the axon becomes depolarized to sodium ions to diffuse into the axon; the inside of the axon becomes positively charged relative to the outside, an action potential is generated.
6. Cerebrum/ cerebral hemisphere/ cerebral cortex
7. (a) B- Cerebellum
C- Medulla oblongata
(b) - Control locomotion

- Control voluntary movement
 - Vision/ hearing/ smell/ taste
 - Intelligence/ memory
 - Personality speech
 - Mediates cranial co-ordination
- (c) Loss of muscle coordination/ balance
8. (a) Cones- Discrimination of colour/ sensitive to high light intensity / bright light.
- (b) Rods- Dim light vision/ low light intensity
9. (a) (i) -Receive sound waves
- Transforms sound waves into vibrations
 - Transmit vibration to the ear ossicles
- (ii) Equalizes the air pressure in the middle ear to that in the outer ear.
- (iii) Amplify/ transmit vibrations from the tympanic membrane in the inner ear.
- (b) There are three semi- circular canals arranged in a plane at right angles to each other. At the end of each canal is a swelling called ampulla which contains receptors.
- Movement of the beat cause movement of the fluid in at least one canal/ the fluid movement deflect the coperta and stimulate the receptors/sensory hairs. Nerve impulses are transmitted to the brain by the auditory nerve.
10. The organisms move towards light so as to absorb it for photosynthesis.
11. (a) Thigmotropism

- (b) -That part of plants is offered support
- The leaves become more exposed to sunlight increasing photosynthesis.
- Flowers become exposed to pollinating agents.

12.

- (a) X- Motor neurone
- Y- Receptor

- (b) Acetylcholine

13. (a) Alter the shape of the lens during accommodation

- (b) - Rods- sensitive to dim light
 - Cannot distinguish colour
- Cones- Sensitive to colour
 - Enhance high clarity of vision

14. (a) Ear ossicles Magnify sound wave vibrations from the ear drum

- (b) Cochlea Receives sound vibrations from the oval window and transmits into the auditory nerve.

(c) Semi- circular canals Structures that help maintain body balance

- (d) Eustachian tube Enhance equalizing of pressure between outer and the middle ear.

15. (a) In the central nervous system (spinal cord)

- (b) (i) Motor neurone
- (ii) P – Dendrites

Q- Axoplasm (Axon)

- (c) Insulates the axon
16. (a) Auxin
- (b) Growth response due to touch of a part of a plant e.g. tendrils
17. The ear is an organ involved in perceiving sound and maintaining body balance and posture. It is made of the following sections.
- Pinna- That is funnel shaped structures made of skin and cartilage. It receives sound waves and directs them to the ear tube.
 - External /auditory meatus- That is a canal lined with hair and wax. It allows passage of sound waves to the middle ear. The hairs and wax trap dust particles that enter the ear.
 - Tympanic membrane that is a thin flexible sheet-like structure receives sound waves and passes the vibration to the ossicles.
 - Middle ear that is composed of:
Tiny bones known as ossicle. They are stapes, anvil and incus. They amplify vibration from the tympanic membrane.
 - Eustachian tube that connects the ear to the nasal cavity. It balances pressure on both sides of the tympanic membrane.
 - Oral window that is a thin flexible membrane that opens into the inner ear. it receives vibrations from the ossicles and passes them to the inner ear.

Inner ear that is composed of:

- Vestibular apparatus that are the semi circular canals, utricles and the saccules.
They help in maintenance of body balance and posture.
 - Cochlea that is a coiled structure that has sensory cells for hearing. It is connected to the auditory nerve that is involved in transmission of sounds to the brain.
- 18.
- Presence of rods having rhodopsin pigment that is sensitive to dim light.
 - Rods are more sensitive to motion and easily notes movement from the cornea of the eye.
 - More than 120 million rods present on the retina.

19. Perceive sound waves.

Maintain body balance and posture.

20.

Response of human eye	Response of flowering plant
<ul style="list-style-type: none">• Quick response• Does not result to growth• Mediated by nerve impulses and brain• The response is not permanent	<ul style="list-style-type: none">• Slow response• Results to growth• Mediated by growth hormones (auxins)• Response is more permanent

21. (i) Thigmotropism
- (ii) Auxins on the stem are sensitive to touch. They migrate to opposite side.
Growth is more on the touched side. This causes bending.
- (iii) Have more chlorophyll to trap sunlight

- Have stomata for entry of carbon dioxide.
 - Thin and transparent cuticle to allow entry of light into the photosynthetic cells
 - Presence of veins for transportation of raw materials to the leaf or food for the leaf.
22. Euglena have chlorophyll and are autotrophic. They move towards light source (positive phototactic) to absorb sunlight for photosynthesis.
23. Acetylcholine is a chemical substance present at the synaptic knob. When a nerve impulse reaches the synapsis, acetylcholine forms in vesicles moving to the membrane.
24. In the spinal chord.
- 25.
- Tar is deposited on parts of the respiratory tract causing cancer.
 - Hardening the blood vessels and can cause heart attack.
 - Irritation of the respiratory tract resulting to frequent coughing.
 - Smoke can cause air pollution.
26. (i) Cones on retina.
- (ii) Vitreous humour.
- (iii) Suspensory ligaments.