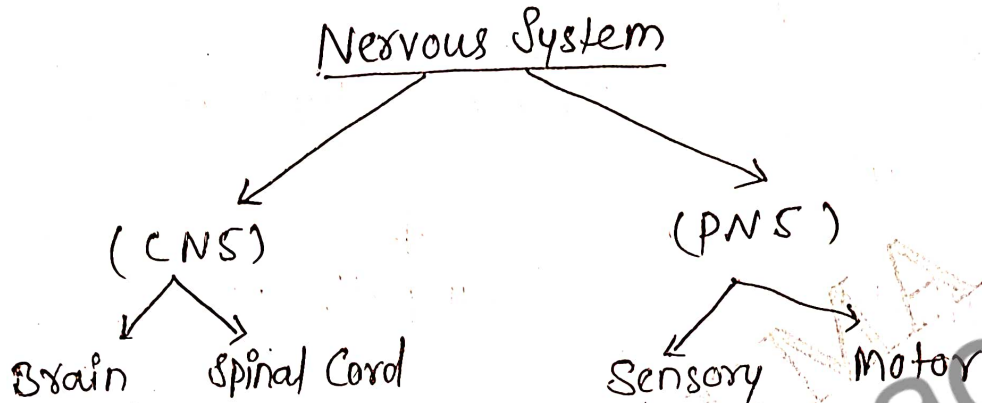


UNIT-IV

★ peripheral nervous system :-

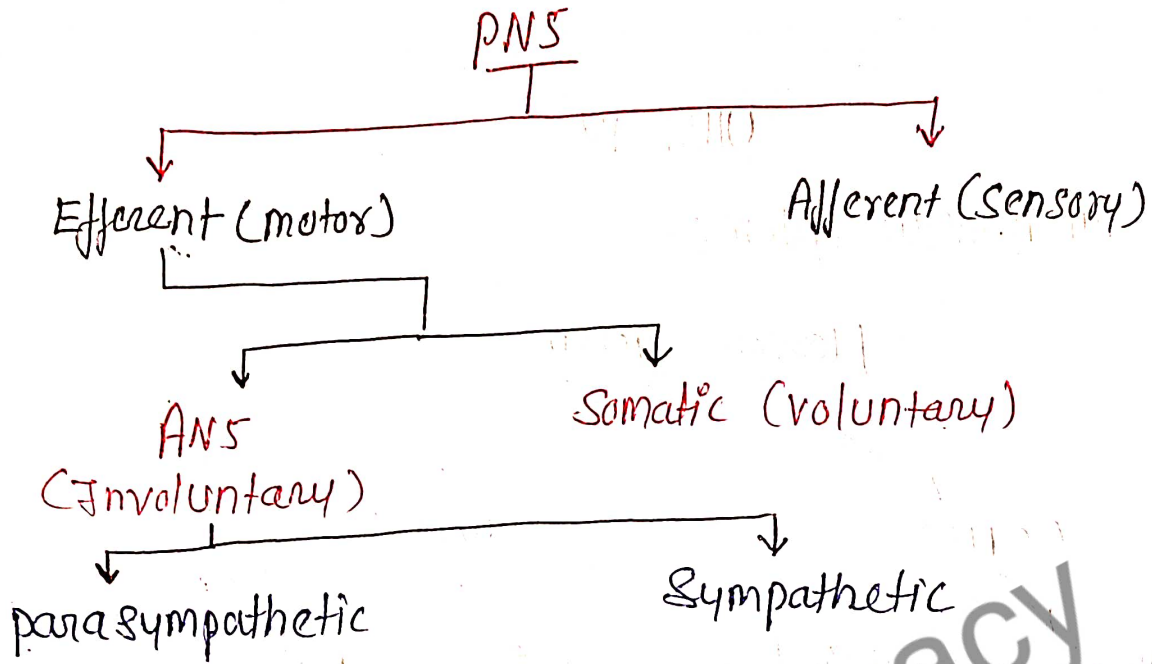


- Responsible for transmission of neuron impulses from sense organs (receptor) to the CNS

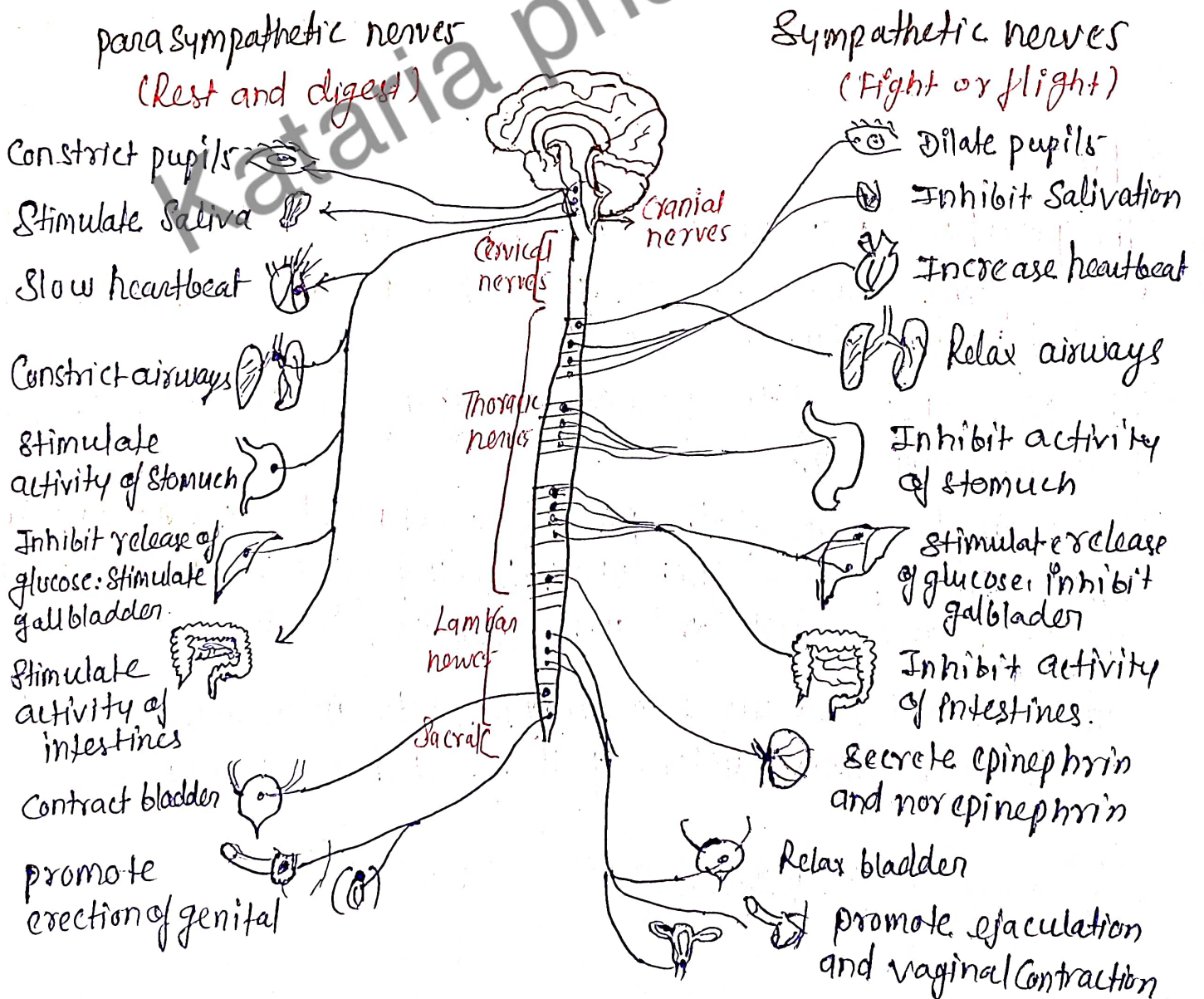
★ PNS :-

- The peripheral nervous system (PNS) is one of the two main parts of the nervous system, the other part is the central nervous system (CNS).
- The PNS consist of the nerves and ganglia outside of the brain and spinal cord.
- The main function of the PNS is to connect the CNS to the limbs and organs, essentially serving as a relay between the brain and spinal cord and the rest of the body.
- The Central nervous system interprets information, and the peripheral nervous system gathers and transmit information.

Classification of PNS :-

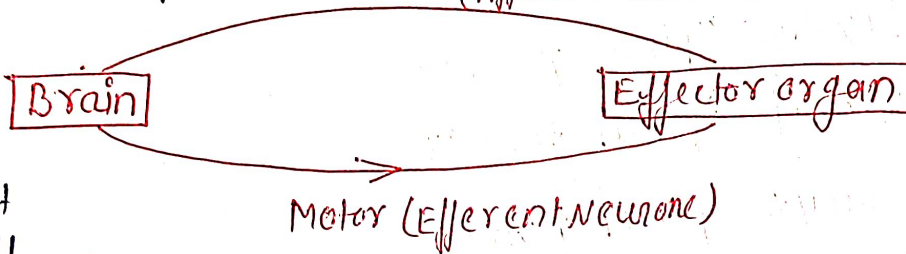


Structure of PNS :-



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Functions of PNS :- Sensory or (Afferent neuron)



- Sight
- Smell
- taste
- touch

- Skeletal muscle
- Cardiac muscle
- Smooth muscle
- gland

Functions of Sympathetic Nervous System:-

- Bronchioles dilate, which allows for greater alveolar oxygen exchange.
- It increase heart rate and the contractility of Cardiac cells (myocytes), thereby providing a mechanism for the enhance blood flow to skeletal muscles.

* Origin and functions of Spinal and cranial nerves :-

Spinal nerves:-

- Spinal nerve are the path of communication between the spinal cord and the specific region of the body.
- 31 pair
- Spinal nerves follows the name of corresponding vertebra column.
- Consists Cervical spinal nerve, thoracic spinal nerve, Lumber spinal nerve, Sacral spinal nerve and coccyx spinal nerve.

Spinal nerves:

1. 8 pair of - Cervical Spinal nerves
2. 12 pair of - Thoracic Spinal nerves
3. 5 pair of - Lumbar Spinal nerves
4. 5 pair of - Sacral Spinal nerves
5. 1 pairs of - Coccyx Spinal nerves.

function of spinal nerve :-

- white matter - Contains the Sensory and motor tracts (highways)
- Gray matter - Site for integration (summing) of action potential.
- Spinal nerve - Connect the CNS to sensory receptors muscles and glands.

Cranial nerves :-

- The 12 pairs of Cranial nerves arise from the brain inside the Cranial cavity and pass through various foramina in the bones of the Cranium.
- Divides into 3 functions: Sensory nerves, Motor nerves and mixed nerves.
- 12 pairs are: -
 - Olfactory nerve (I) - Originate from nose
 - Optic nerve (II) - Originate from eye
 - Facial nerve
 - Oculomotor nerve (III)
 - Trochlear nerve (IV)
 - Trigeminal nerve (V)
 - Abducens nerve (VI)

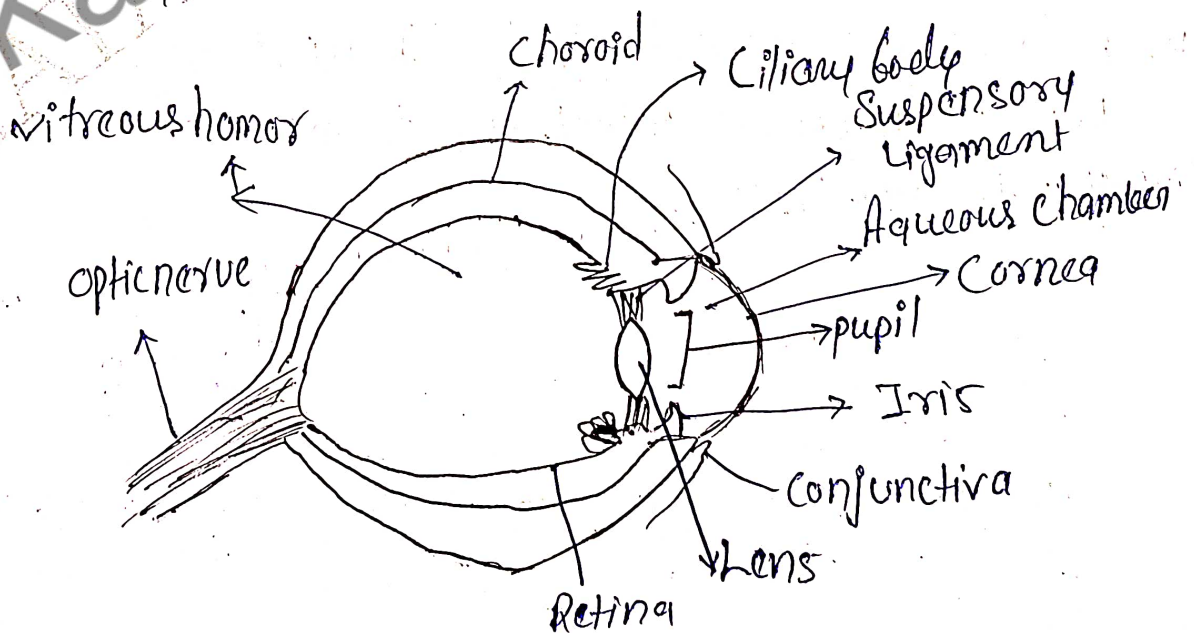
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- Facial nerve (VII) - Originate from face
- Vestibulocochlear nerve (VIII) - Originate from ear
- Glossopharyngeal nerve (IX) -
- Vagus nerve (X) - Originate from heart.
- Accessory nerve (XI)
- Hypoglossal nerve (XII)

★ Special Senses :

① Eye :

The human eye is an organ which reacts to light and pressure. As a sense organ, the mammalian eye allows vision. A Normal eye structure.



parts of human eye :-

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→ The front part of the eye includes.

- Iris: the colored part
- Cornea: a clear dome over the iris
- Pupil: the black circular opening in the iris that lets light in.
- Sclera: the white of your eye.

function of eye :-

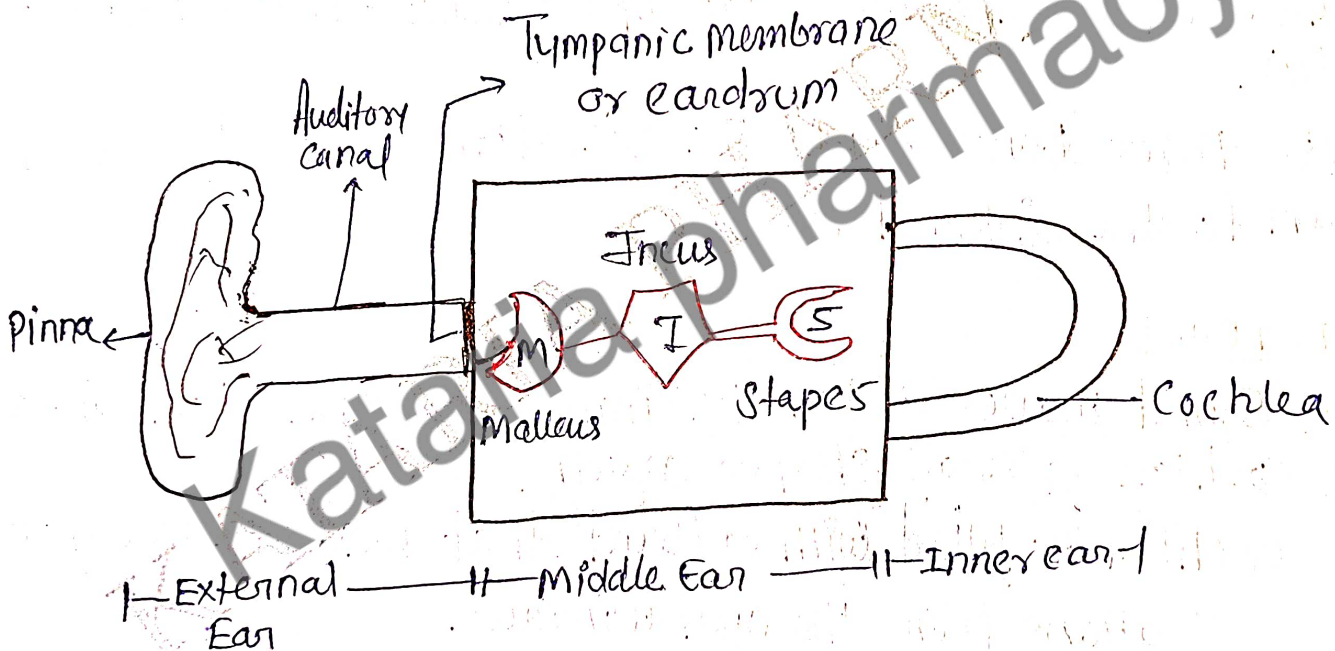
1. Eye are sense organs that detect and respond to light stimulus giving us sense of sight.
2. The eye allows us to see & interpret the shapes, colours and dimensions of objects in the world by processing the light they reflect.
3. They contain photoreceptors: rods & cones located in the retina.
4. Rods & cones detect light stimuli & convert light energy to nerve impulses which are transmitted to the brain for interpretation.

② EAR :-

The ear is the organ of hearing and balance. It is controlled by the brain through the Cochlear nerve.

→ The parts of the ear include: External or outer ear, consisting of: pinna or auricle.

Structure of ear :-



Broken into three sections:

- ① Outer (External)
- ② middle
- ③ inner

① External ear :-

The auricle (pinna) is the visible portion of the outer ear. It collects sound waves and channels them into the

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external auditory meatus (ear Canal) where the sound is amplified.

- The sound waves then travel toward a flexible, oval membrane at the end of the external (eardrum). The tympanic membrane begins to vibrate.

② Middle ear :-

- It is a small chamber it's made up of bone and a membranous wall.
- These chamber consists three bone, malleus (hammer) incus (anvil) and stapes (stirrup) (smallest in the human body).
- These three bones send the vibration of sound from the eardrum to the internal ear.

③ Inner ear :-

- The sound waves enter the inner ear and then into the cochlea, a snail shaped organ.
- The cochlea is filled with a fluid that moves in response to the vibrations from the oval window.
- As the fluid moves 25,000 nerve endings are set into motion.
- These nerve endings transform the vibrations into electrical impulses that then travel along the VIII cranial nerve (auditory nerve) to the brain.
- The brain then interprets these signals and this is how we hear. The inner ear also contains the vestibular organ that is responsible for balance.

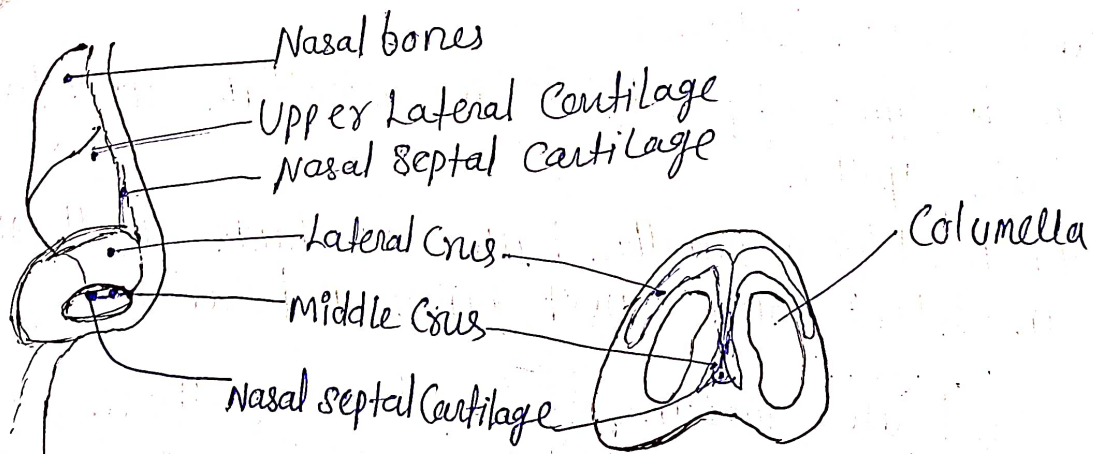
Function of ear :-

- Collect sound
- Receptor for hearing
- ~~Trans~~ Receives sound impulses
- Transmits them to the brain
- Inner ear maintains balance

③ Nose :-

- The nose is the part of the respiratory tract superior to the hard palate.
- It contains the peripheral organ of smell.
- It acts as a passageway for air entering to body (Lungs) through inspiration and expiration (exit the lungs)

Structure :-



Functions of nose :-

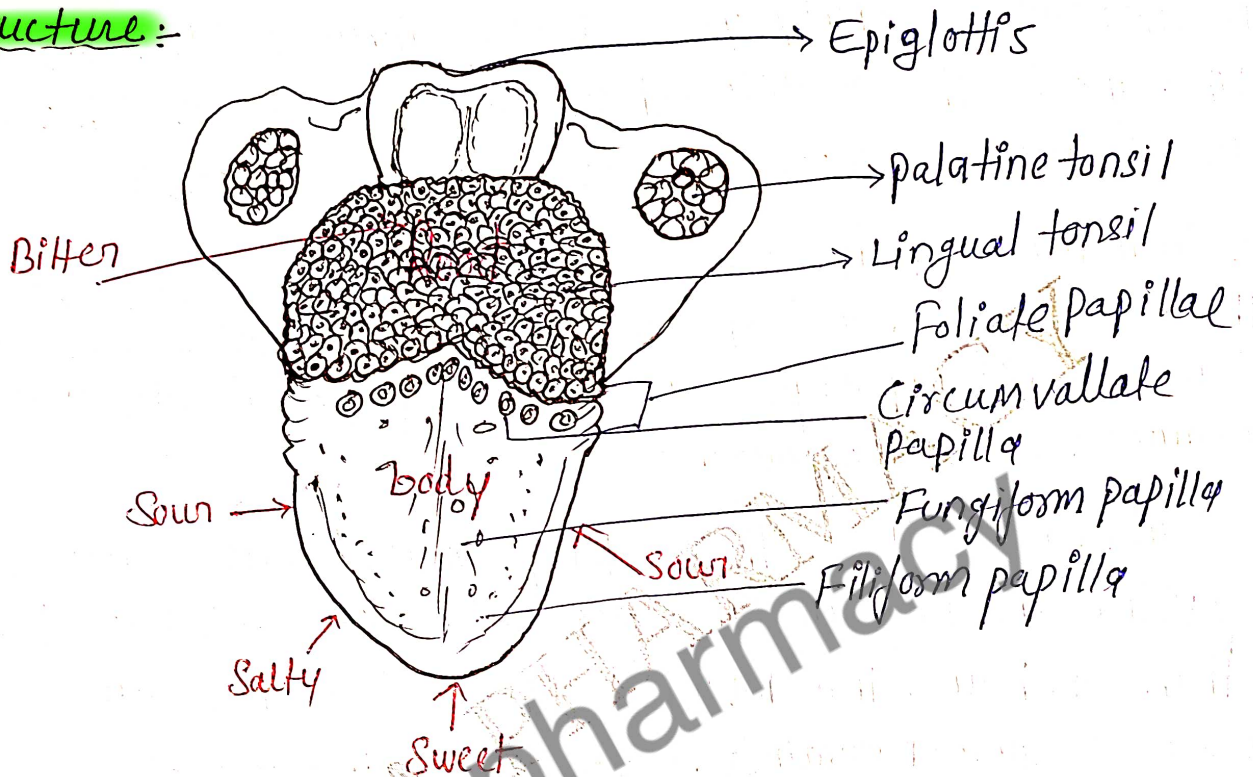
1. Breathing
2. Air Conditioning of inspired air
3. Protection of lower airway
4. Ventilation and drainage of p.n.s.
5. Olfaction
6. Nasal resistance
7. Vocal resonance
8. Nasal reflexes

④ Tongue :-

- Tongue is a muscular organ situated in the floor of the mouth.
- Associated with the functions of taste, speech, mastication and deglutition.
- oral part → lies in the mouth
- pharyngeal part → lies in the pharynx
- On the surface of the oral part of the tongue, it contains lingual papillae (which are hair like structures that gives tongue its rough texture)
- There are 4 types of papillae: Circumvallate, fungiform, filiform, and foliate papillae.
- All except the filiform papillae, have taste buds on them and they can detect sour, sweet, bitter, and salty.
- Along the lower midline of the tongue, there is a fold of mucous membrane called lingual frenulum, which connects the tongue to the floor of the oral cavity.

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Structure :-



Functions :-

- Mastication
- Mixing of food with Saliva
- Positions food between teeth
- Formation of food bolus
- Initial oral stage of Swallowing
- Articulation of sound in speech
- They are sensitive to four main tastes : Bitter, Sour, Salty & Sweet.
- To help to clean the teeth.
- To help speaking.

* Disorder of eye, ear, nose and tongue :-

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Disorder of eye :-

- ① Conjunctivitis :- (pink eye) It involve swelling of the Conjunctiva lines inside the eyelids which cover the sclera of the eye as well (Cause :- viruses, bacteria, smoke, dirt, pollens)
- ② Glaucoma :- In the case of this eye disease, the optic nerve of the eye is damaged and can lead to loss of vision over time. A build-up of pressure takes place inside the eye. (Cause :- ↑ intraocular pressure.)
- ③ Ocular migraine :- This is temporary disease causeds loss of vision in one eye and generally does not last for more than an hour. This might happen after a migraine headache. (Cause: regular migraines, spasms in bloodvessels of the retina).
Drug: aspirin, B-blocker
- ④ Retinal vascular occlusion :- This disease affects the retina and lowers the supply of oxygen-rich blood. (Cause: Blood clots, High BP, obesity, smoking, atherosclerosis,)
Drug: blood thinner
- ⑤ Ophthalmoplegia :- paralysis of the eye muscles occurs. Can occur in more than one of the eye muscles. (Caused: muscle disorder, migraines, thyroid problems, stroke etc)

Disorder of ear :-

- ① OTITIS EXTERNA :- It refers to the inflammation of external auditory canal. (Cause :- Infection by Staphylococcus aureus, water in ear canal)
- ② Impacted Cerumen :- It is a condition in which ear wax accumulates in ear canal leading to blockage and pressure on ear canal. (Cause: use of hearing aids or ear plugs, putting object in the ear, anatomical defect, older age.)

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③ Furunculosis :- It is infectious disorder characterized by formation of boils in the hair follicles.

(Causes: poor hygiene, malnutrition, weak immune system)

Drug: Nimesulide 100mg BD

Disorder of middle ear :-

④ Otitis media :- It is the inflammation of the mucous membrane of the middle ear, Eustachian tube and mastoid process.

⑤ Serous otitis media :- It is also known as glue ear or secretory otitis media. It is collection of fluid without evidence of active infection in the middle ear i.e middle ear effusion. It commonly found in children.

⑥ Chronic otitis media :-

It is chronic inflammation of middle ear with tissue damage, usually caused by repeated episodes of acute otitis media.
(Cause: persistent episodes of acute otitis media)

Disorder of inner ear :-

⑦ Hearing Loss :-

Hearing loss also known as hearing impairment is partial or total inability to hear.

It may occur in one or both ears.

Disorder of Nose:

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① Rhinitis :- Rhinitis is inflammation and Swelling of the Mucous Membrane of the nose, characterized by a runny nose and stuffiness and usually caused by the Common Cold or a Seasonal allergy. Cause: viral and bacterial infection, allergies.

② Allergic Rhinitis :-

Allergic rhinitis is caused by a reaction of the body's immune system to an environmental trigger.

→ The most common environmental triggers include

- Dust
- Grasses
- molds
- Trees
- pollens
- Animals.

③ Chronic rhinitis :-

Chronic rhinitis is usually an extension of rhinitis caused by inflammation or a viral infection.

→ It also may rarely occur with some other disease.

(a) Syphilis

(b) TB

(c) Leprosy

④ Atrophic rhinitis :-

Atrophic rhinitis is a form of chronic rhinitis in which the mucous membrane thins (atrophies) and hardens, causing the nasal passage to widen (dilate) and dry out.

→ This atrophy often occurs in older people

⑤ Vasomotor rhinitis :-

Vasomotor rhinitis is a form of chronic rhinitis, Nasal stuffiness, sneezing, and runny nose - Common allergic

Disorders of Tongue :-

① Ankyloglossia :-

Fixation of tongue to the floor of mouth causing restricted movement.

② Aglossia :-

→ This developmental condition is seen in rare conditions.

→ This is mostly observed by complete absence of tongue.

③ Microglossia :-

→ This is a rare disorder.

→ There is tiny or rudimentary tongue development in oral cavity.

④ Squamous Cell Carcinoma of tongue :-

Smoking, alcohol abuse are risk factors for SCC of tongue.

→ Usually painless.

→ Presents as a non-healing ulcer.

