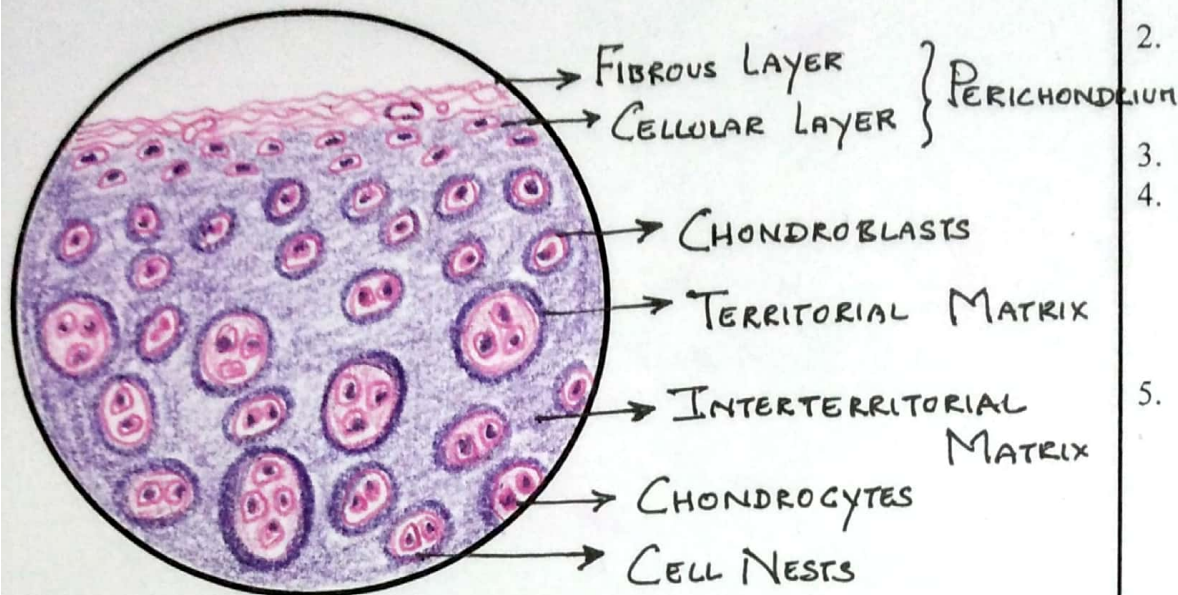


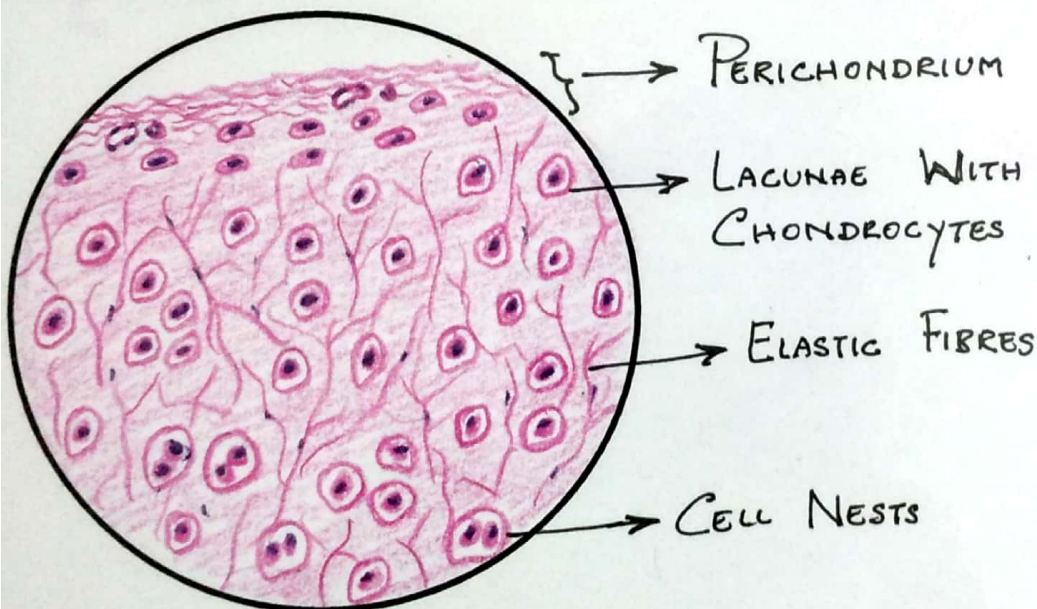
STUDY OF CARTILAGE

Hyaline cartilage



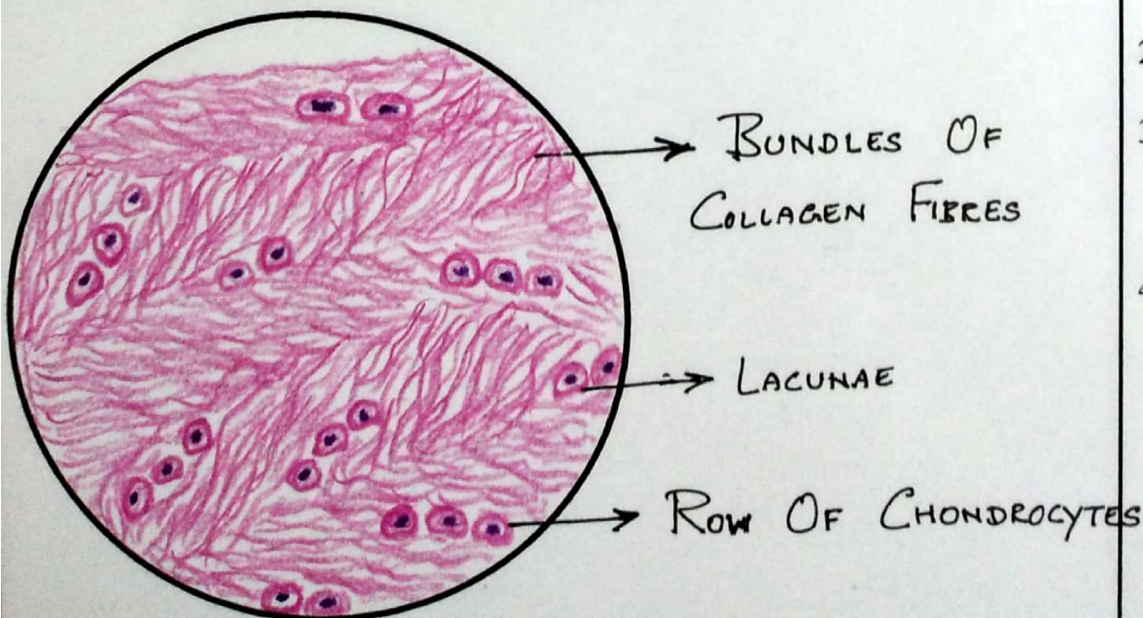
1. Outer perichondrial layer with fibroblasts
2. Inner chondrogenic layer of perichondrium contains chondroblasts
3. Homogenous matrix
4. Chondrocytes in the lacunae appear either singly or in isogenous groups known as cell nests
5. Seen on the articular surface, costal cartilage, nose, larynx, trachea and bronchi.

Elastic cartilage



1. Outer perichondrial layer with fibroblasts
2. Inner chondrogenic layer of perichondrium contains chondroblasts
3. Matrix rich in elastic fibres
4. Chondrocytes in the lacunae appear mainly singly or in few isogenous groups known as cell nests.
5. Occurs in the external ear, walls of the auditory tube, epiglottis & larynx

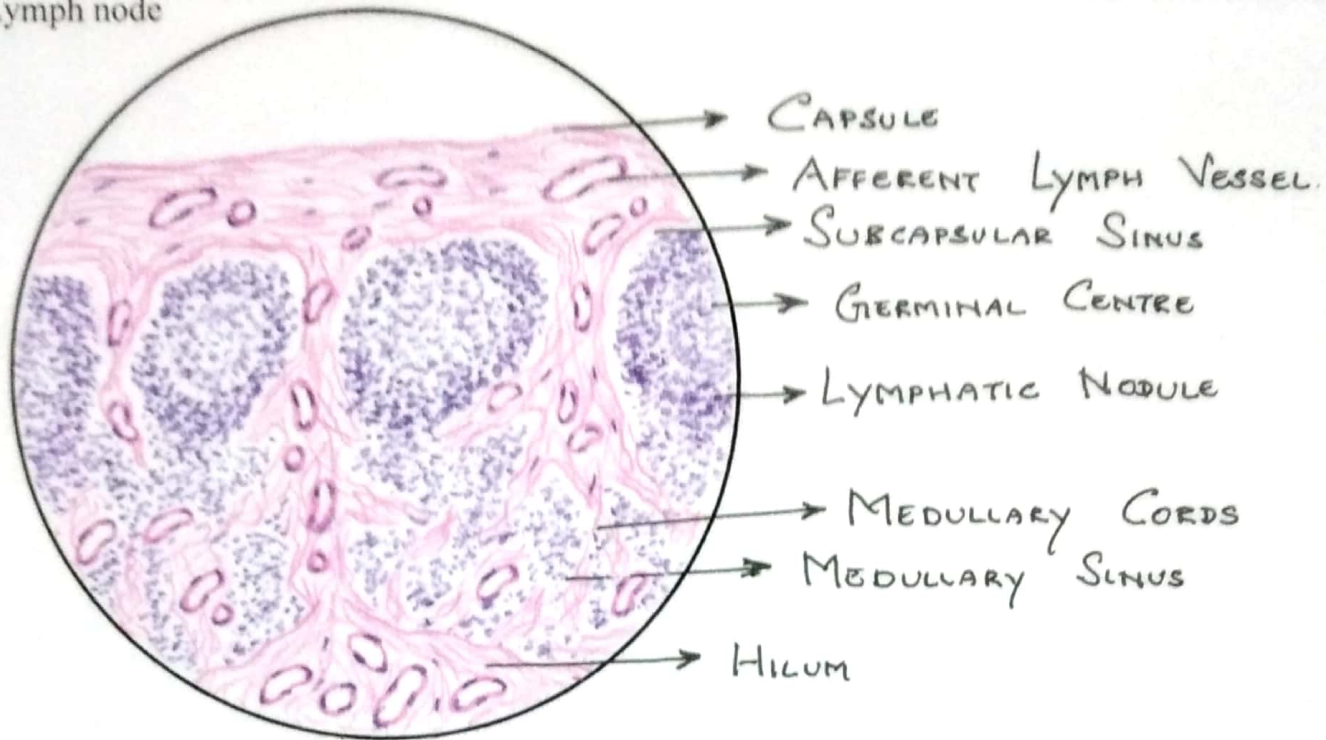
White fibro cartilage



1. Absence of perichondrium
2. Matrix rich in collagen fibres
3. Small chondrocytes in lacunae are distributed in rows within the fibrous matrix
4. Found in the intervertebral discs, symphysis pubis and certain joints

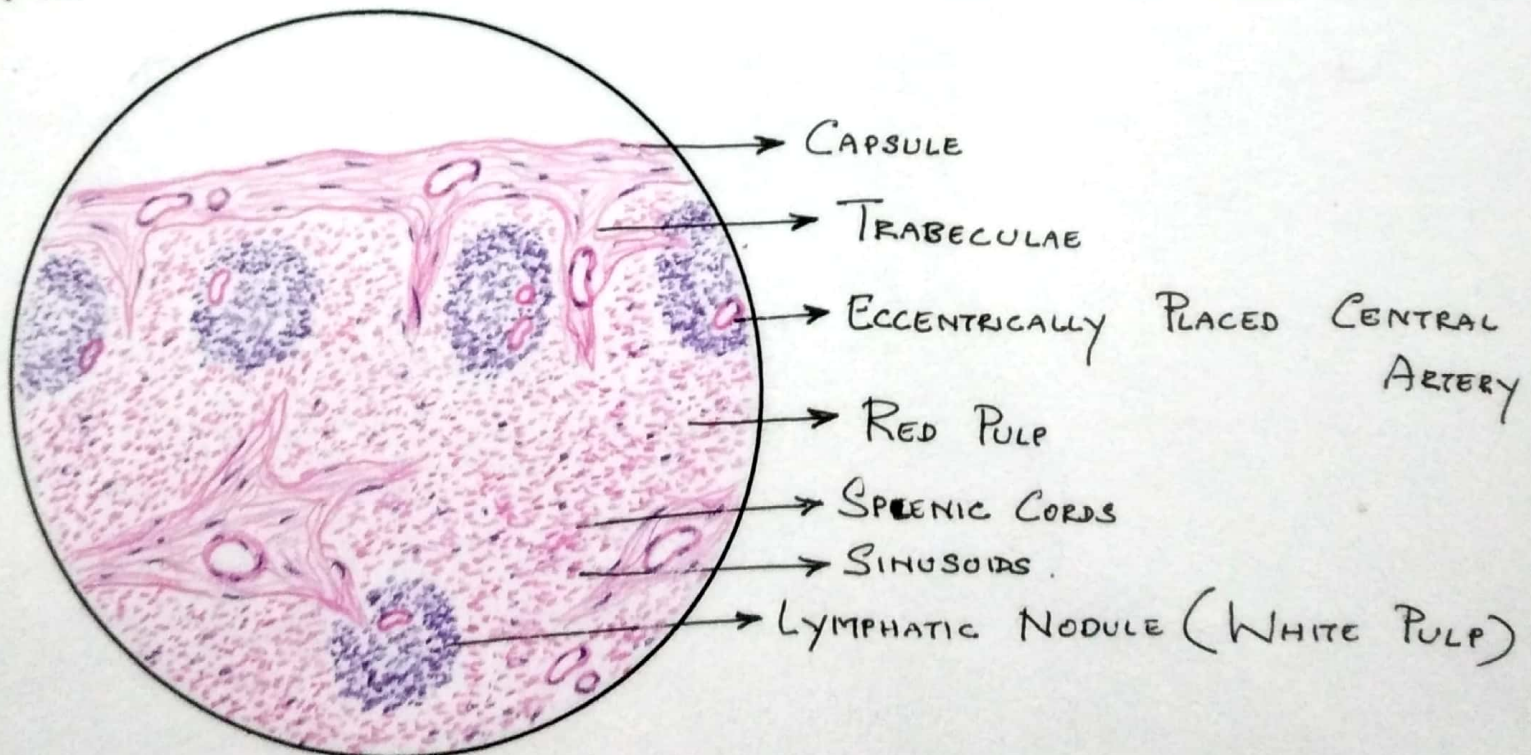
STUDY OF LYMPHATIC SYSTEM

Lymph node



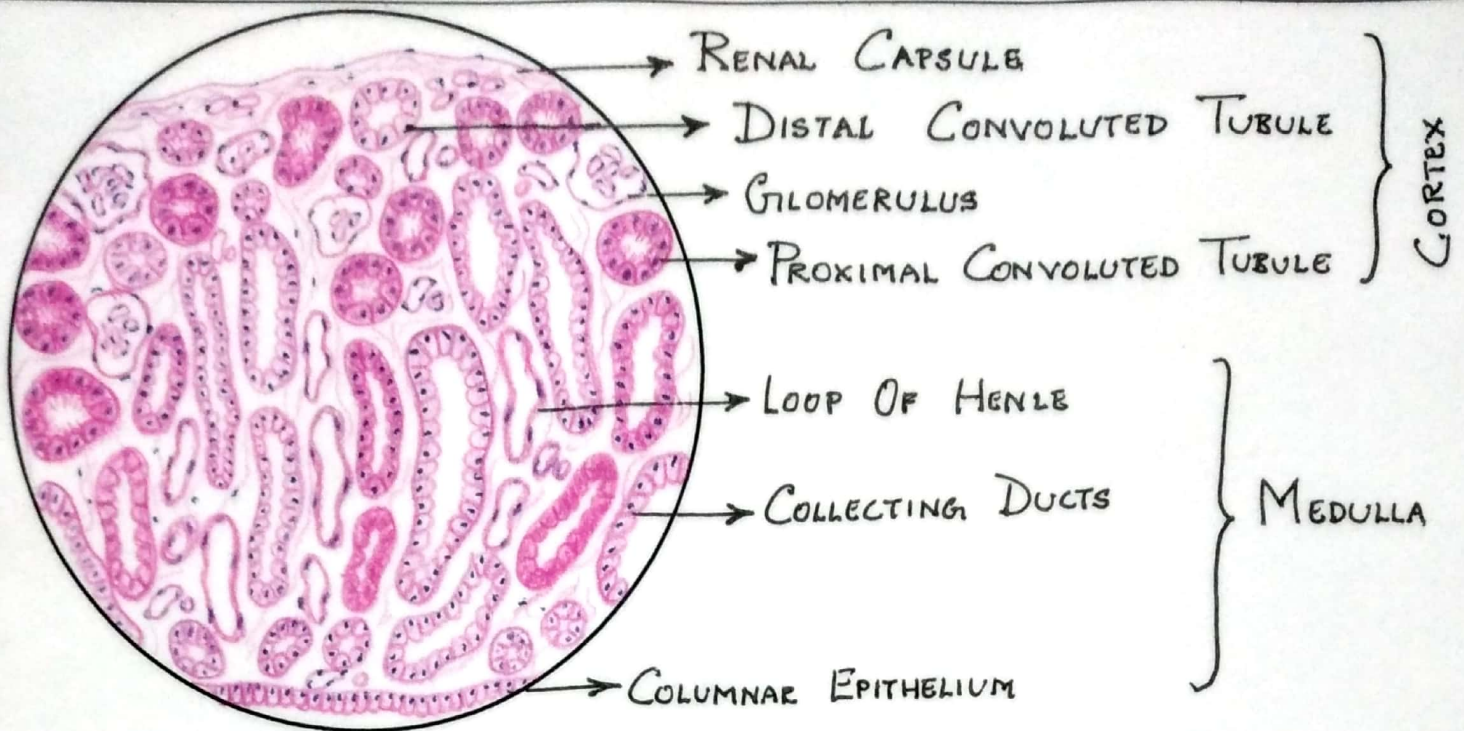
- Covered by capsule and presence of subcapsular sinus or space beneath the capsule
- Consists of cortex & medulla
- Cortex consists of numerous lymphatic nodules with germinal centre and medulla contains medullary cords and medullary sinuses

Spleen



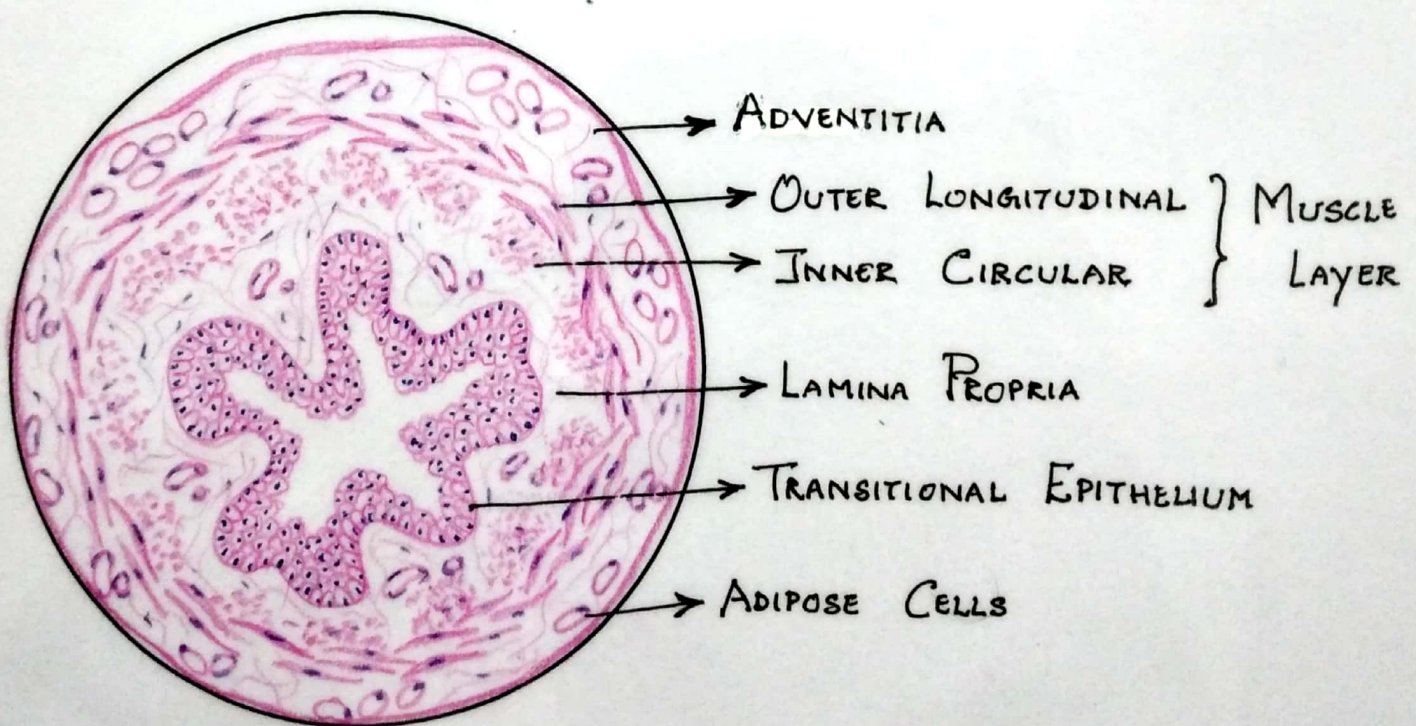
- Covered by capsule which gives rise to trabeculae
- Consists of white pulp and red pulp
- White pulp consists of numerous lymphatic nodules with germinal centre and central artery located at the periphery of the lymphatic nodule.
- Red pulp consists of pulp arteries, venous sinuses and splenic cords of Billroth

URINARY SYSTEM: KIDNEY



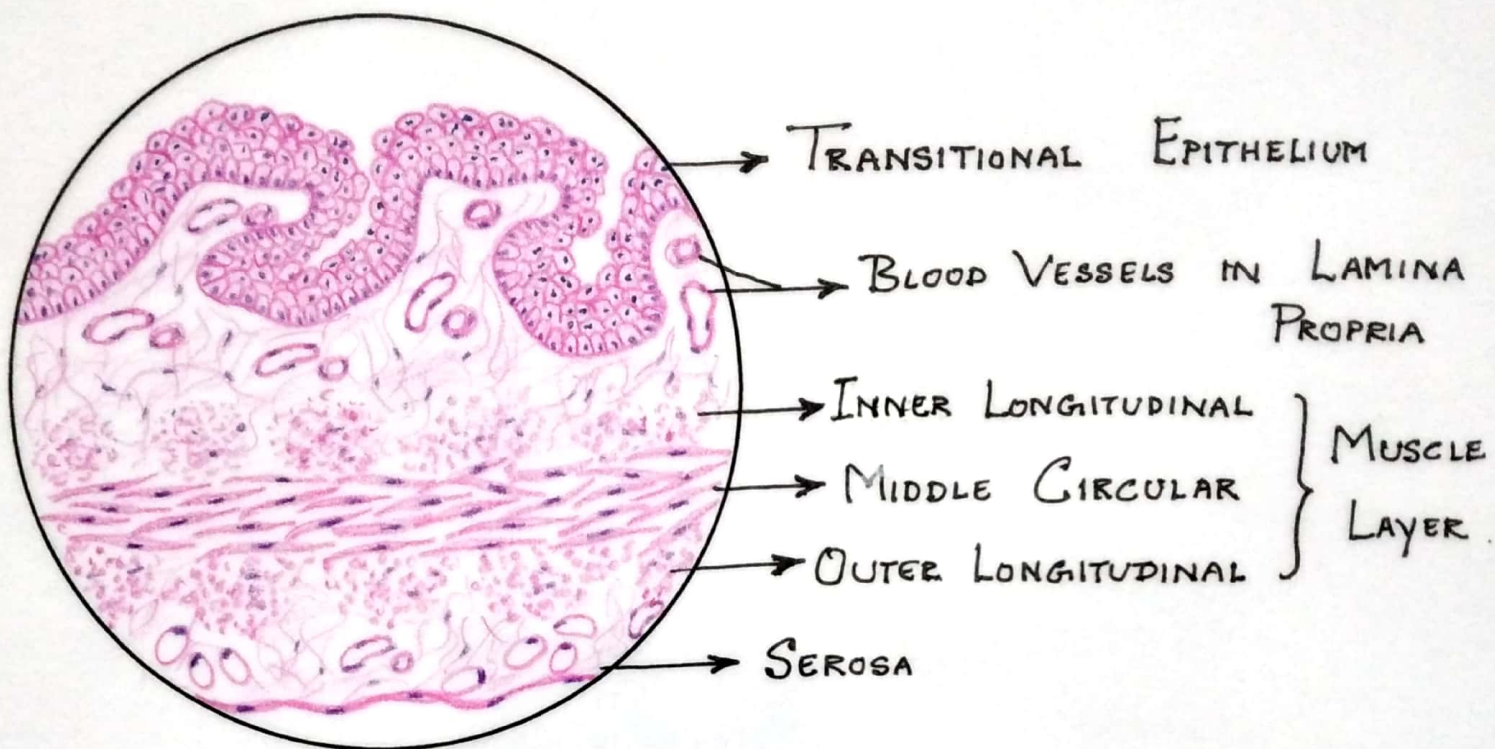
- Consists of outer cortex and inner medulla
- Cortex is covered by renal capsule
- Cortex contains both DCT & PCT, renal corpuscles and medullary rays
- Medulla comprises of renal pyramids, Henle's loop and collecting ducts

URINARY SYSTEM: URETER



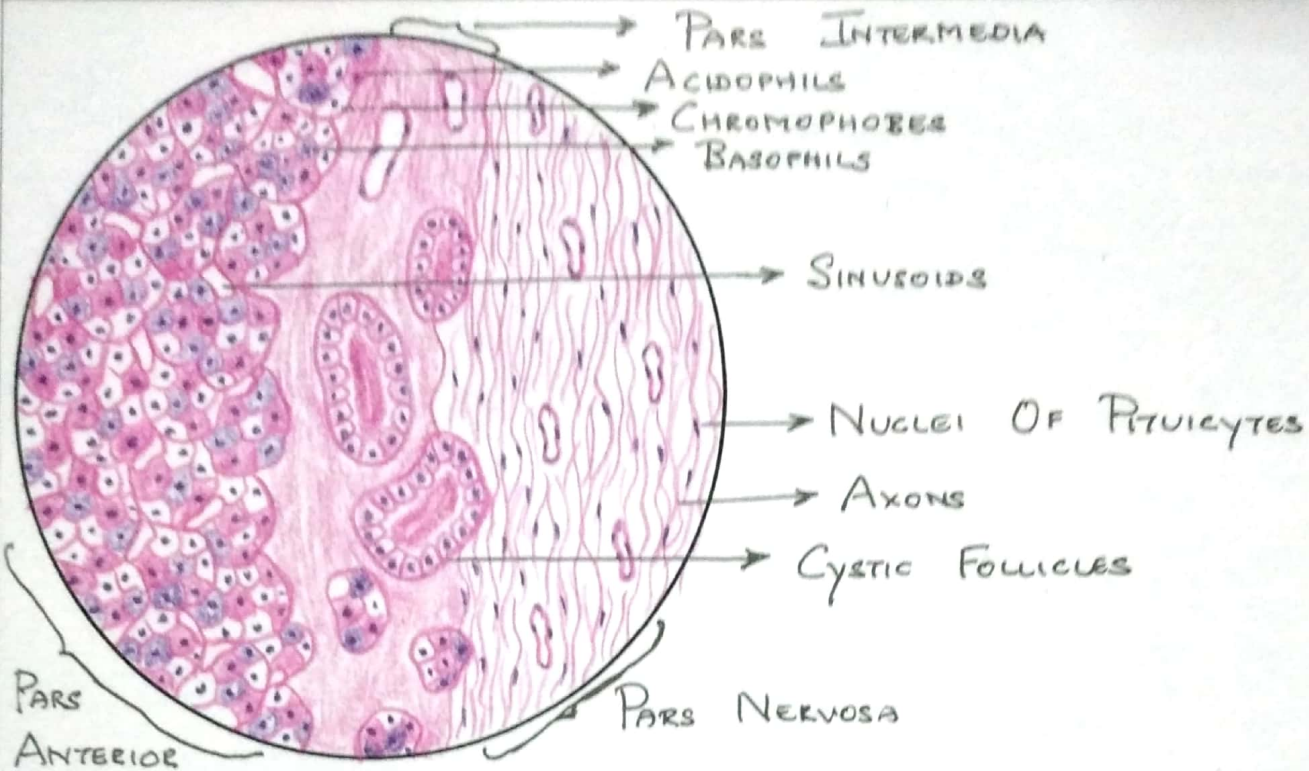
- Wall of the ureter consists of mucosa, muscularis & adventitia
- Star shaped lumen
- Mucosa lined by transitional epithelium
- Muscularis consists of inner longitudinal and outer circular smooth muscle layer
- Outer longitudinal layer is found in the lower third of ureter near the bladder

URINARY SYSTEM: URINARY BLADDER



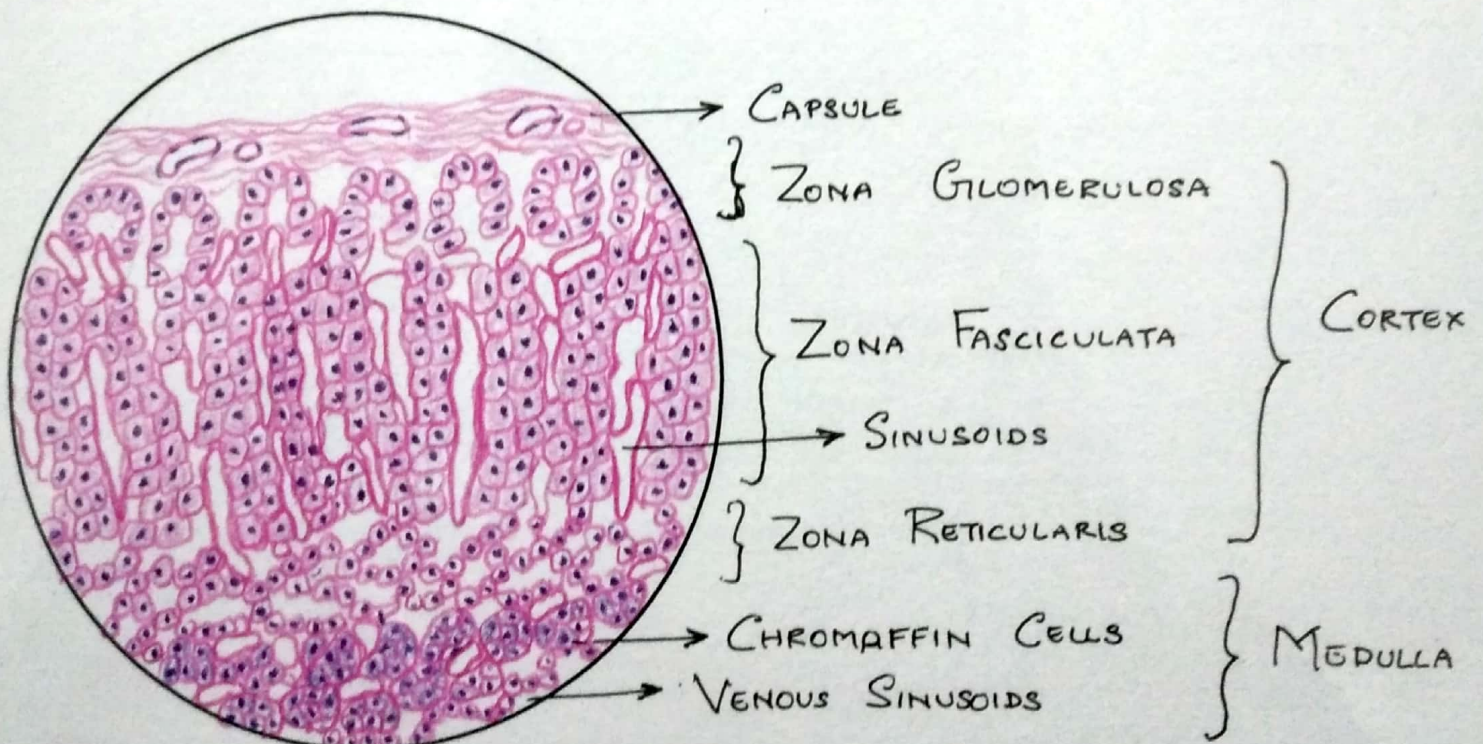
- Mucosa lined by Transitional epithelium
- Submucosa is absent
- Muscularis consists of inner longitudinal, middle circular and outer longitudinal smooth muscle layers

ENDOCRINE SYSTEM: PITUITARY GLAND



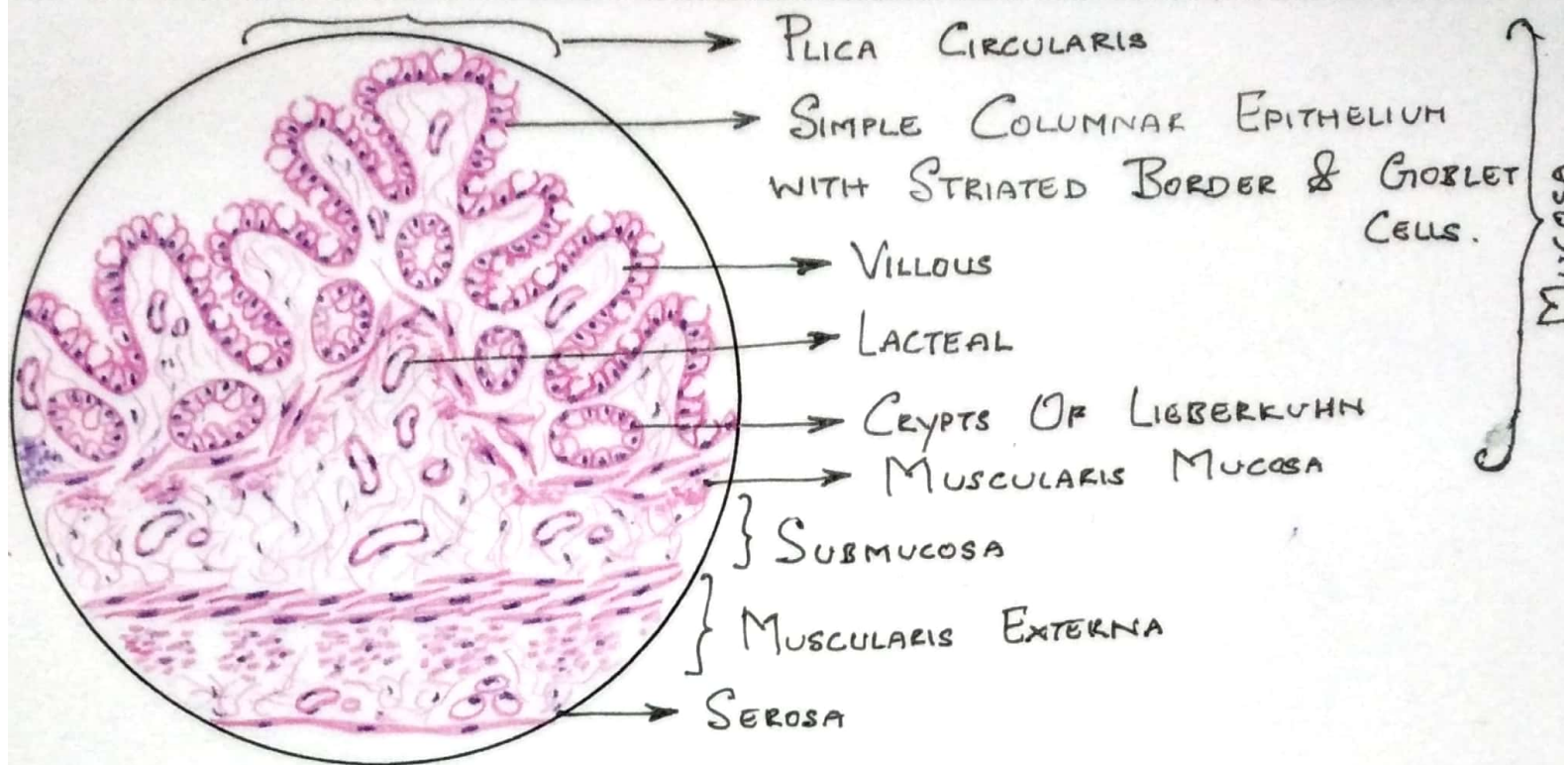
- Pars anterior consists of chromophobe and chromophil cells with sinusoids.
- Pars intermedia consists of colloid filled vesicles.
- Pars posterior consists of unmyelinated axons and supporting pituicytes.

ENDOCRINE SYSTEM: SUPRARENAL GLAND



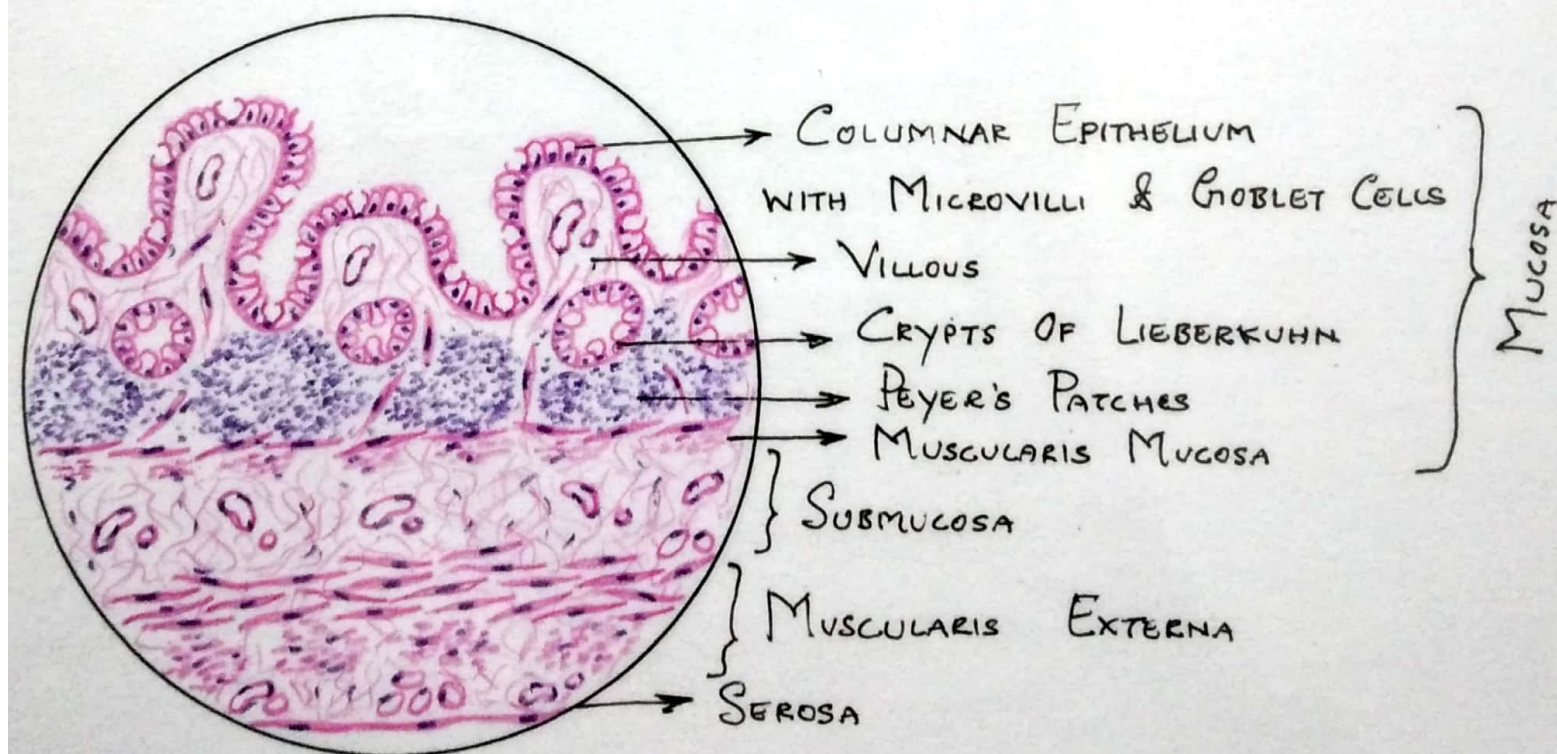
- Consists of outer cortex and inner medulla surrounded by thick connective tissue capsule.
- Cortex consists of 3 zones, outer zona glomerulosa (cells arranged as acini or inverted U-shaped or clumps), middle zona fasciculata (cells arranged in vertical columns or radial plates) and inner zona reticularis (cells form anastomosing cords surrounded by sinusoids)
- Medulla contains sympathetic neurons and sinusoids

GASTROINTESTINAL SYSTEM: JEJUNUM



- Leaf like villi lined by simple columnar epithelium with striated border and goblet cells.
- Characteristic presence of plica circularis and lacteals
- Lamina propria contains intestinal glands with Paneth cells
- Myenteric (Auerbach) nerve plexus seen between the two muscle layers of Muscularis externa.

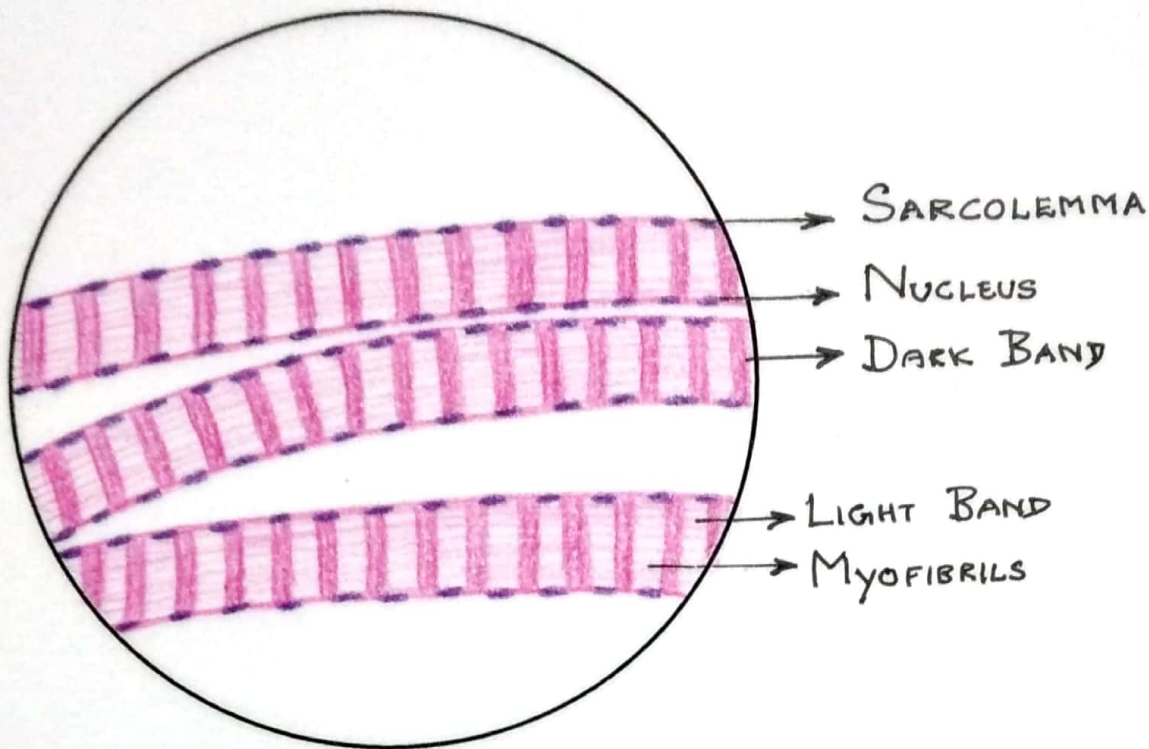
GASTROINTESTINAL SYSTEM: ILEUM



- Short villi lined by simple columnar epithelium with numerous goblet cells.
- Characteristic presence of Peyer's patches in the lamina propria.
- Lacteals are present.

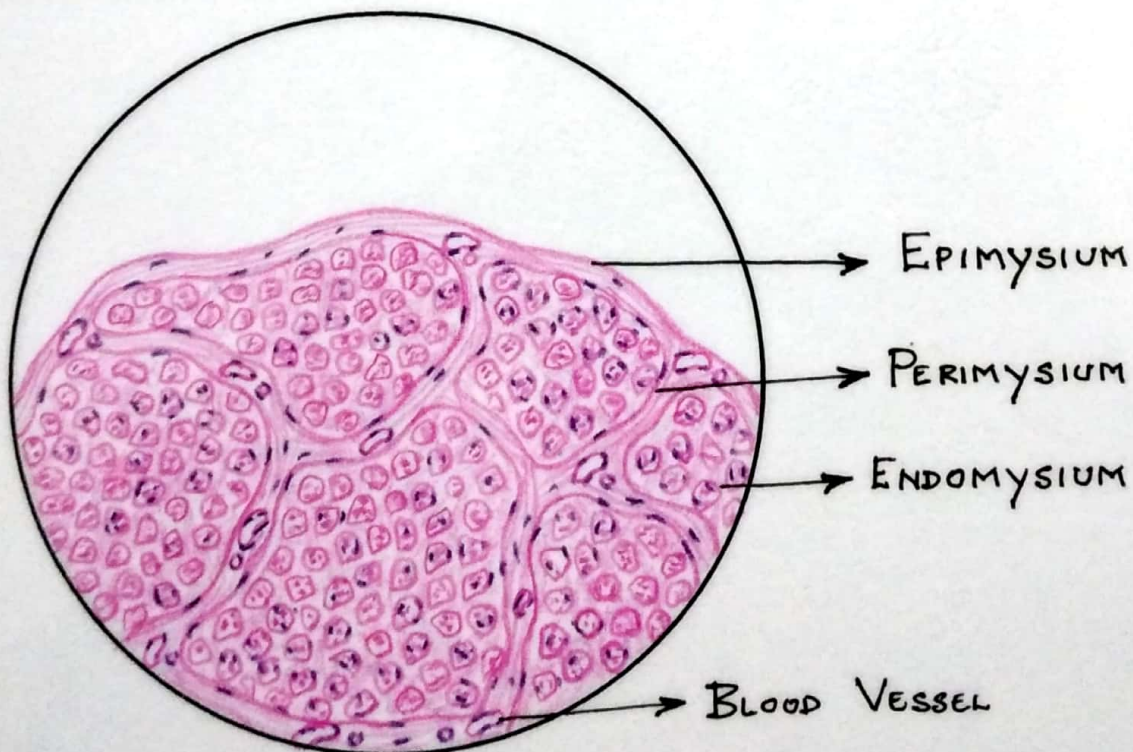
STUDY OF MUSCLE TISSUE

Skeletal muscle L.S



- Long cylindrical muscle fibres with striations
- Multinucleated with peripherally placed flattened nuclei

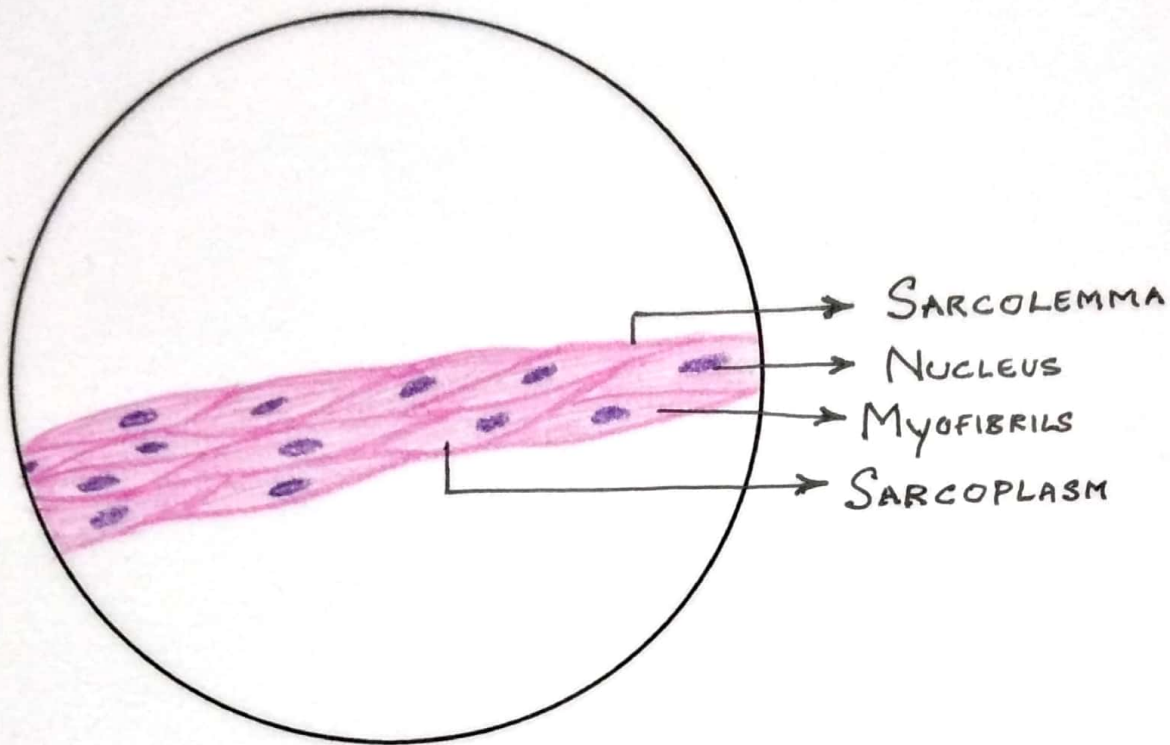
Skeletal muscle T.S



- Peripherally nucleated muscle fascicles surrounded by perimysium
- Individual muscle fibres are invested by endomysium
- Epimysium covers the whole muscle tissue

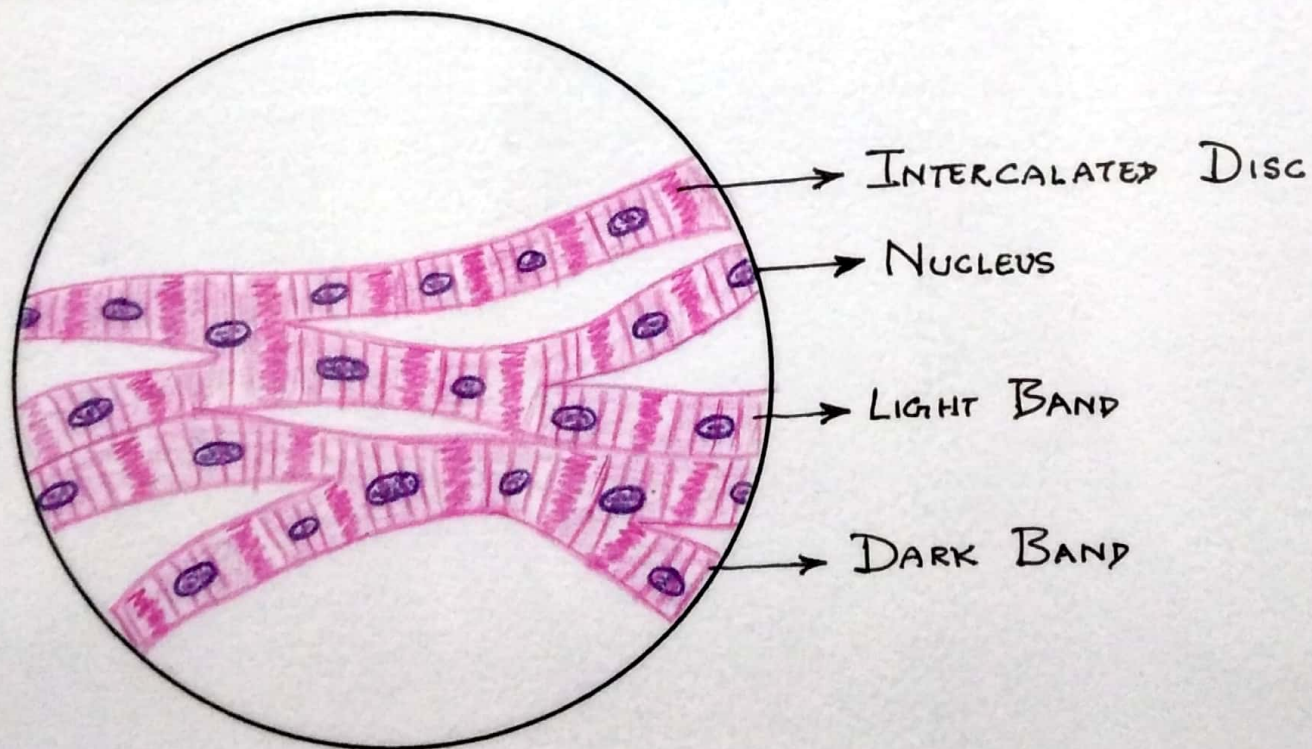
STUDY OF MUSCLE TISSUE

Smooth muscle



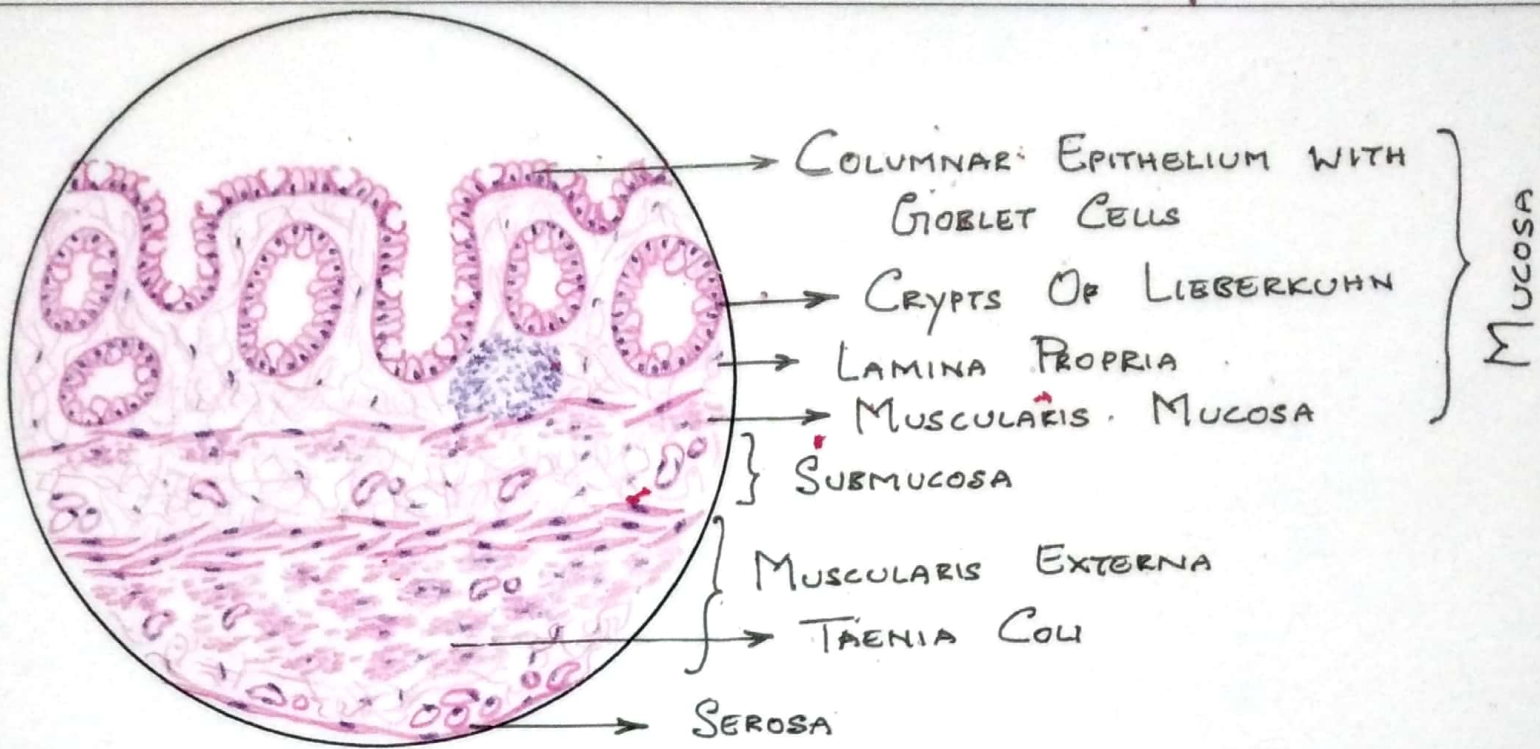
- Spindle shaped myocytes with tapering ends seen in bundles
- Central elongated or ovoid single nucleus
- Absence of striations

Cardiac muscle



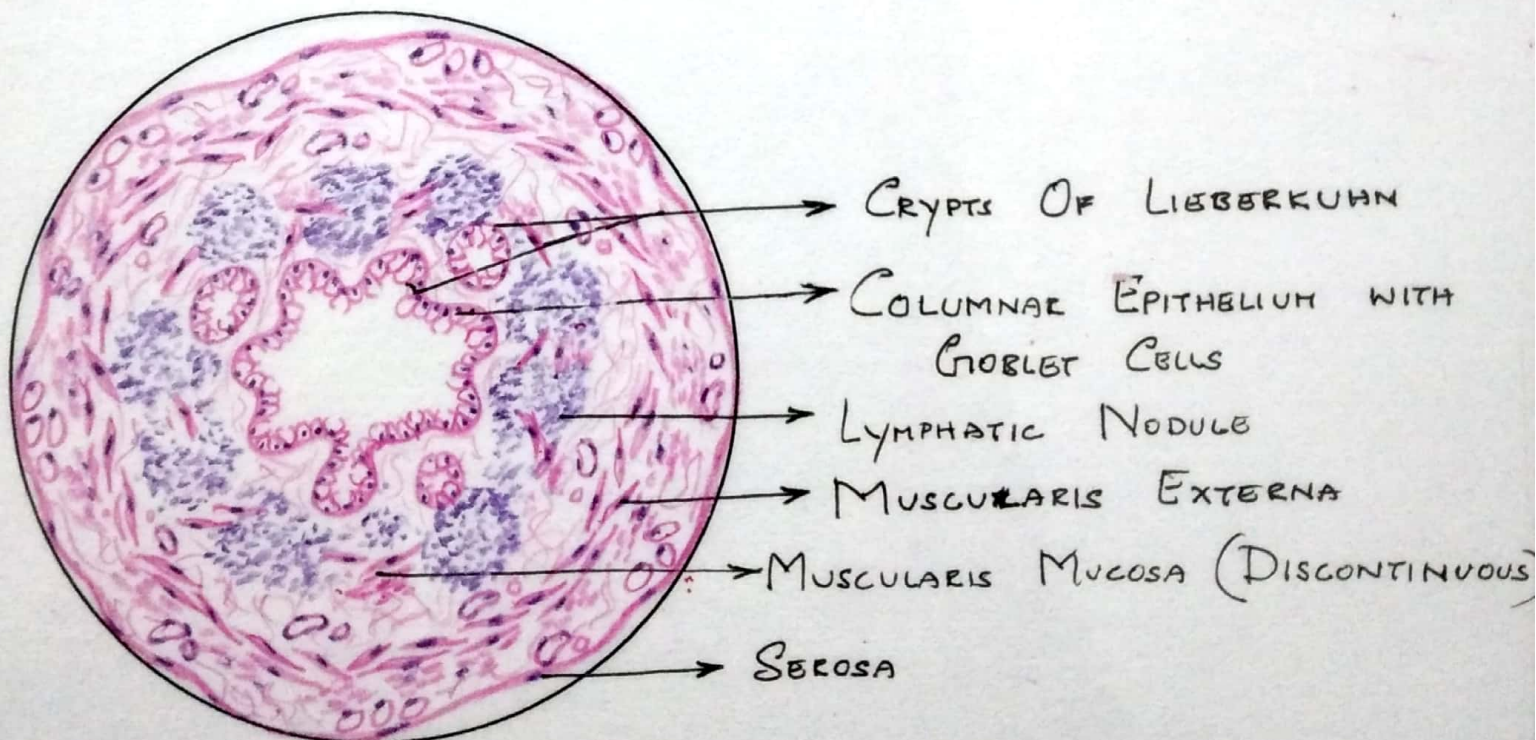
- Branching of muscle fibres
- Contains a single centrally located nucleus
- Presence of intercalated discs

GASTROINTESTINAL SYSTEM: COLON (Transverse section)



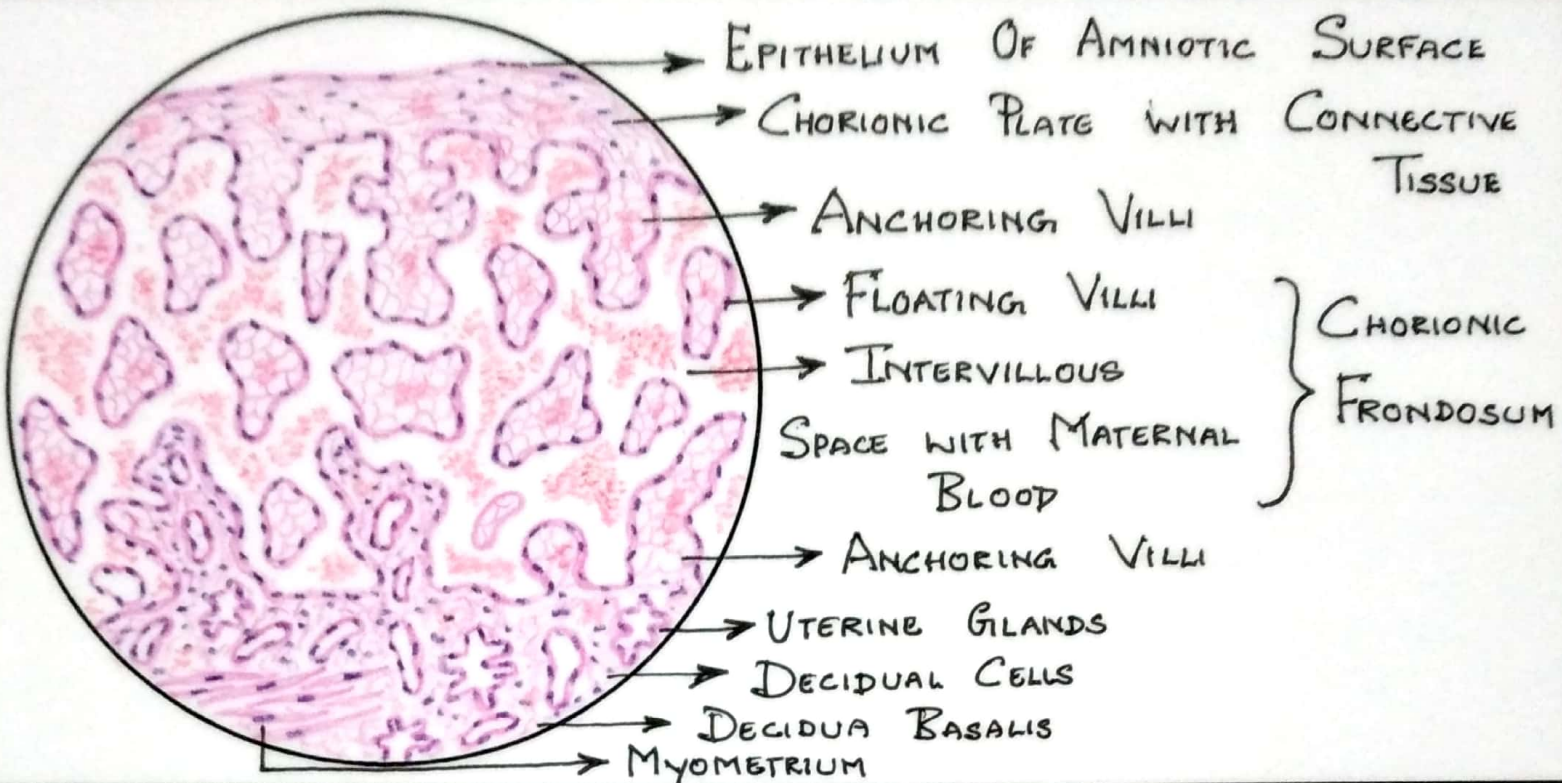
- Simple columnar epithelium with numerous goblet cells
- Folds consists of mucosa & submucosa
- Villi are absent
- Longitudinal layer of muscularis externa is arranged as strips or bands of smooth muscle called Taeniae coli

GASTROINTESTINAL SYSTEM: APPENDIX (Transverse section)



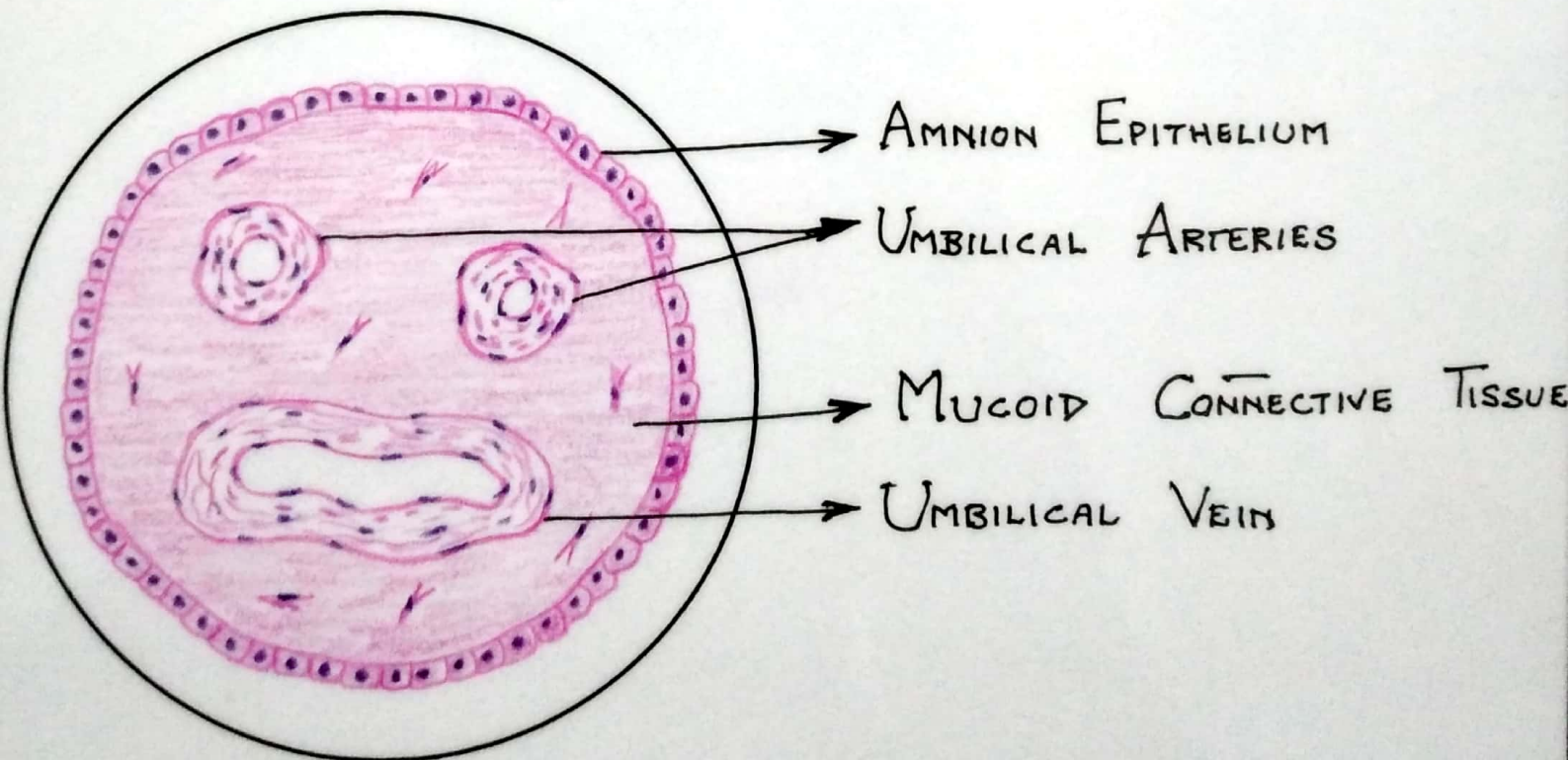
- Simple columnar epithelium with numerous goblet cells
- Diffuse lymphatic tissue in the lamina propria
- Lymphatic nodules with germinal centre are numerous & highly characteristic of the appendix

STUDY OF PLACENTA



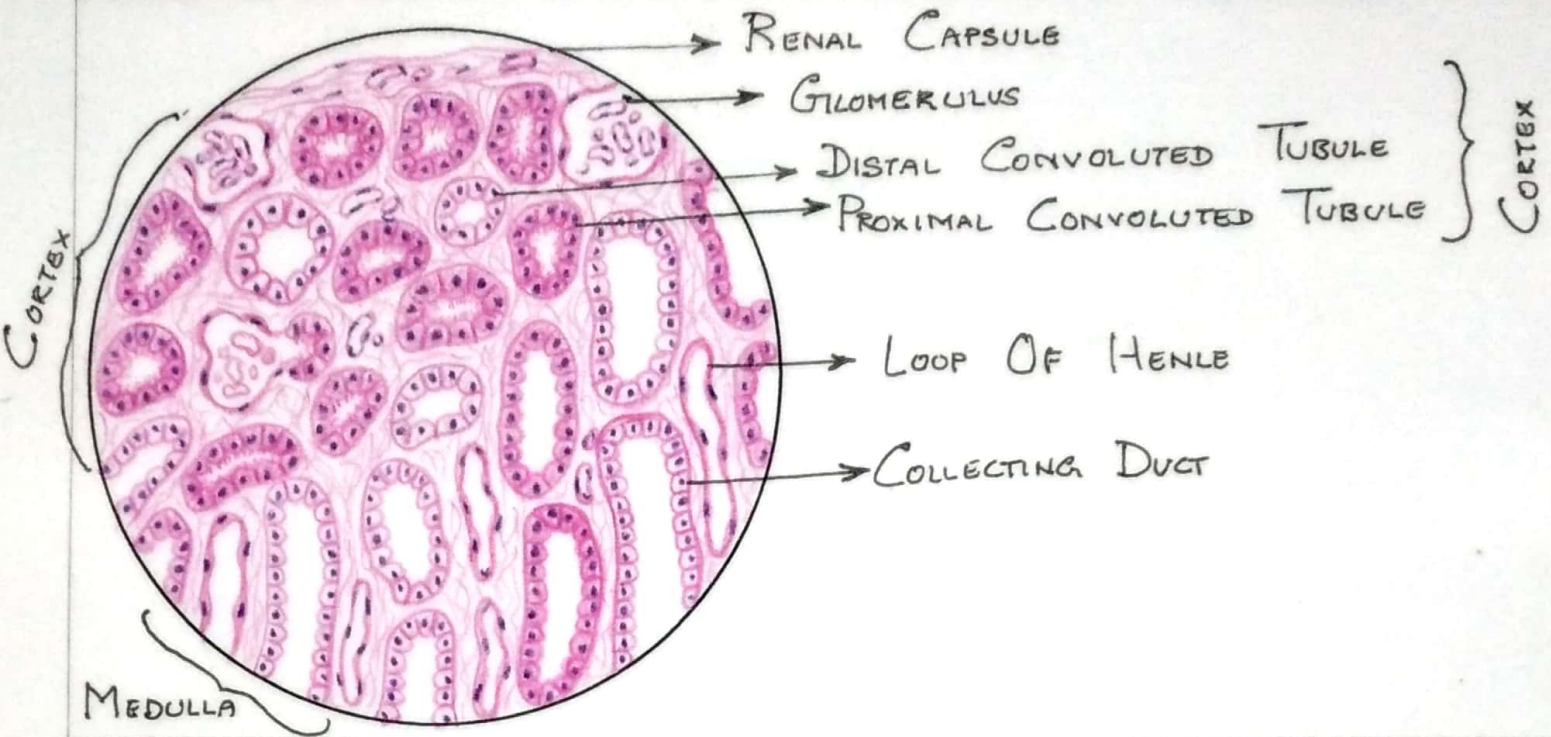
- Decidua basalis and chorionic frondosum seen
- Anchoring and floating villi seen
- Uterine glands and maternal blood vessels seen in decidua basalis

STUDY OF UMBILICAL CORD



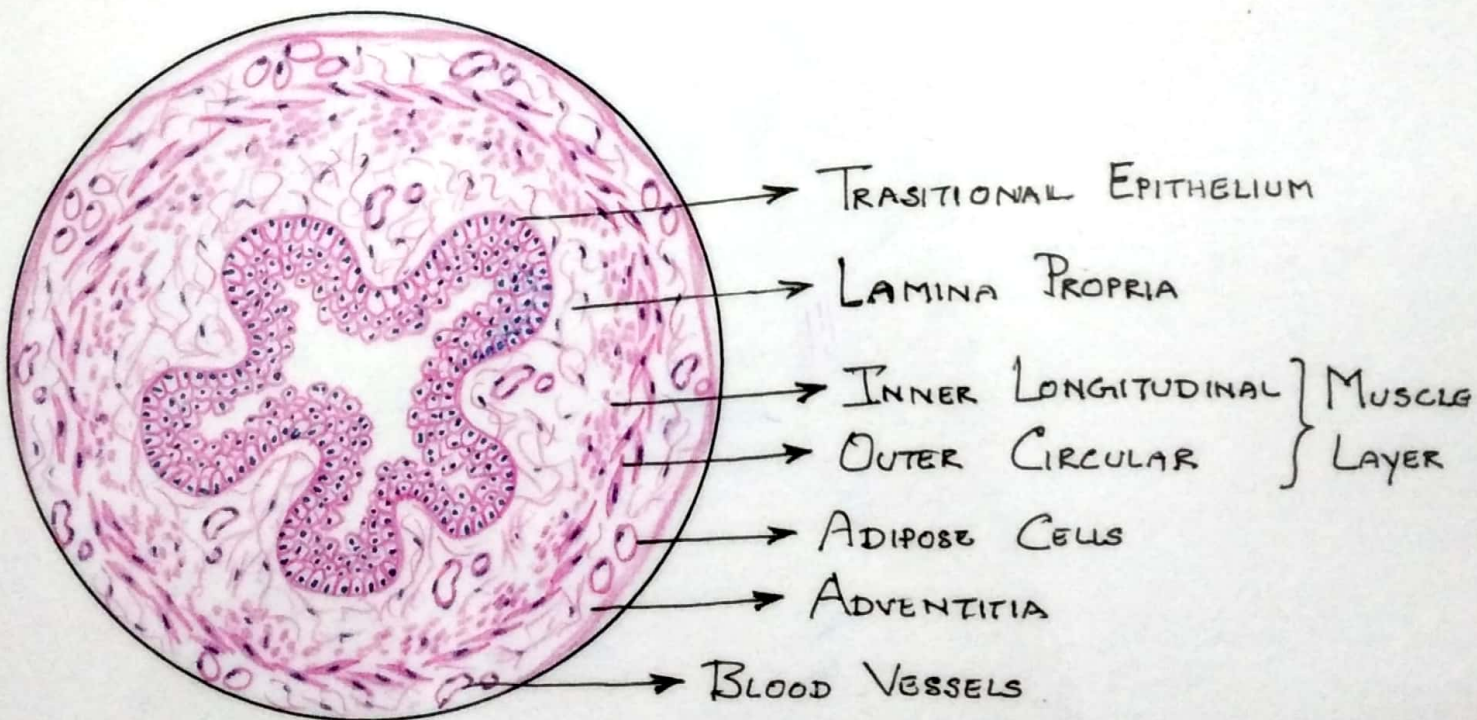
- Wharton's jelly (mucoid connective tissue) present.
- Two umbilical arteries and one umbilical vein seen

URINARY SYSTEM: KIDNEY



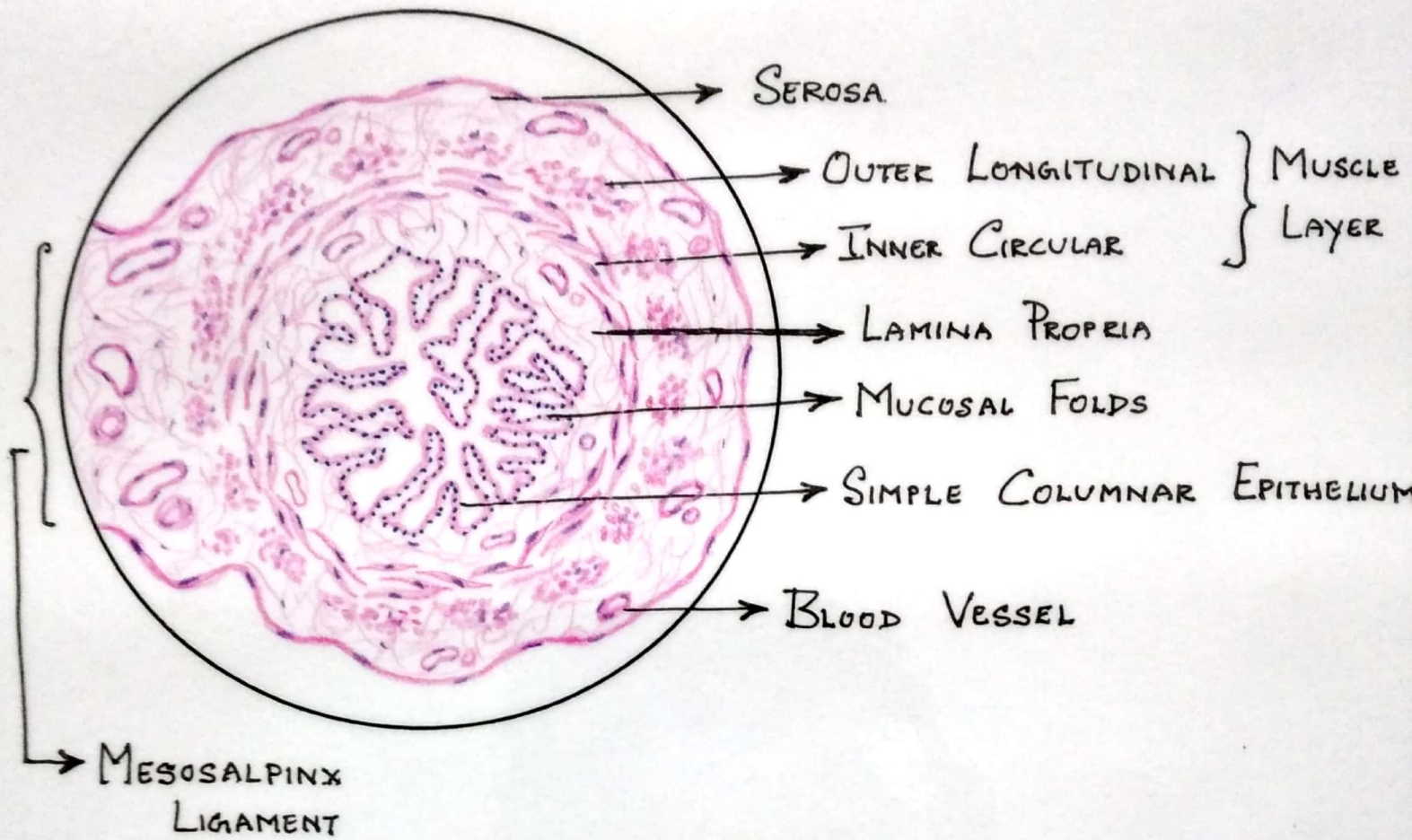
- Consists of outer cortex and inner medulla
- Cortex is covered by renal capsule
- Cortex contains both DCT & PCT, renal corpuscles and medullary rays
- Medulla comprises of renal pyramids, Henle's loop and collecting ducts

URINARY SYSTEM: URETER



- Wall of the ureter consists of mucosa, muscularis and adventitia
- Star shaped lumen
- Mucosa lined by transitional epithelium
- Muscularis consists of inner longitudinal and outer circular smooth muscle layer
- Outer longitudinal layer is found in the lower third of ureter near the bladder

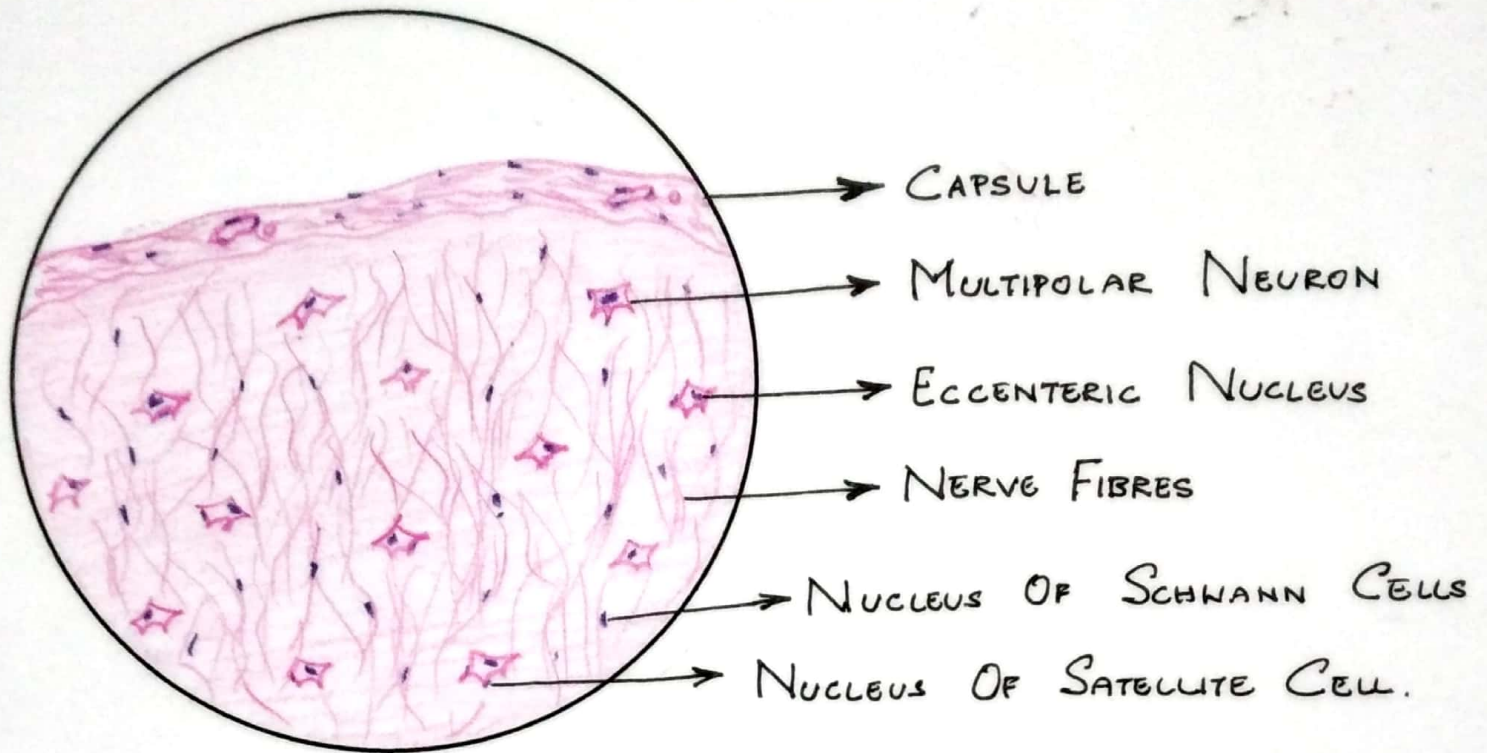
FEMALE REPRODUCTIVE SYSTEM: FALLOPIAN TUBE



- Mucosa is lined by simple columnar ciliated and nociliated peg cells
- Mucosa is highly folded
- Muscularis consists of inner circular and outer longitudinal layer

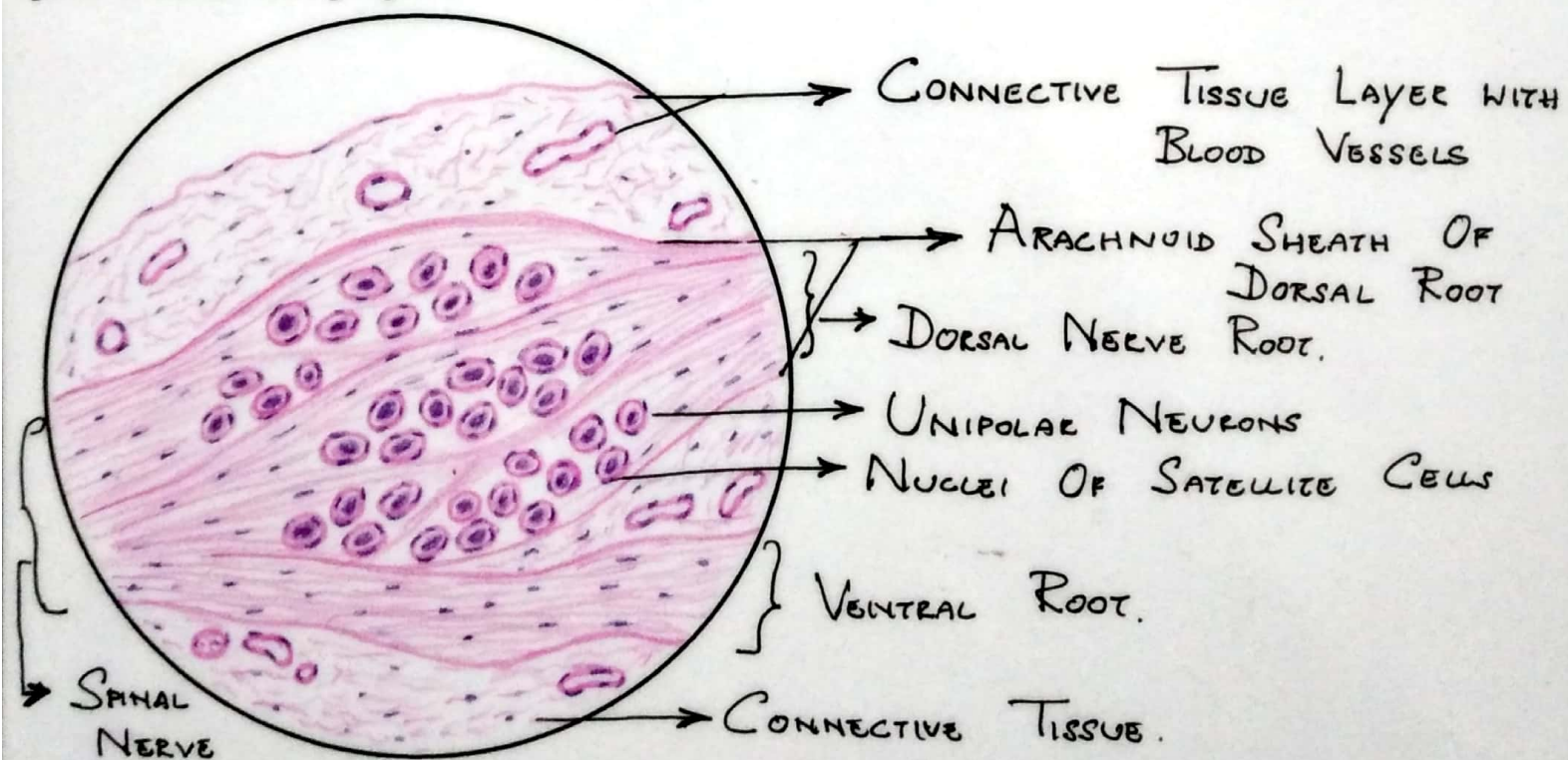
STUDY OF NERVOUS TISSUE

Symphathetic ganlion



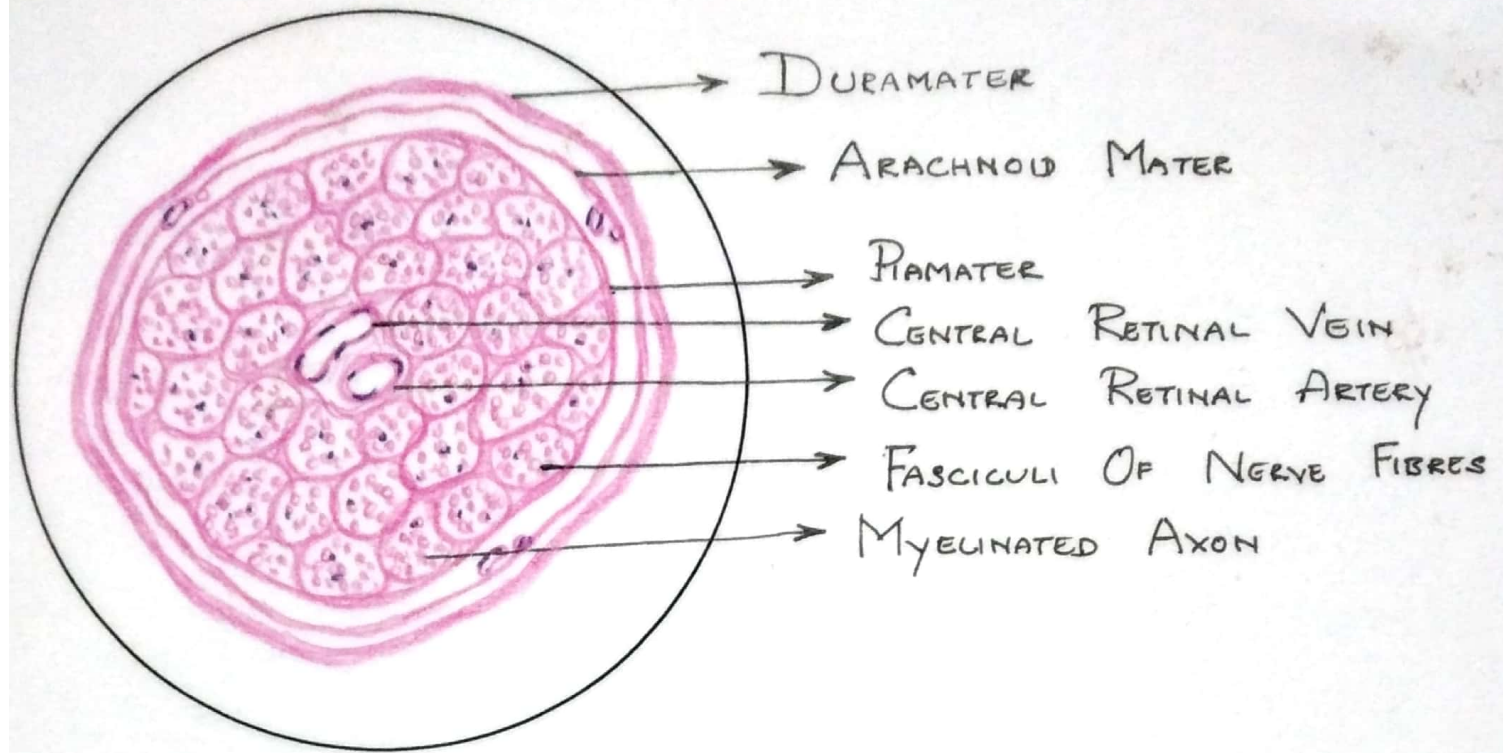
- Small multipolar neurons with eccentric nuclei
- Poorly defined satellite cells
- Unmyelinated and myelinated nerve axons seen

Spinal or dorsal root ganglion



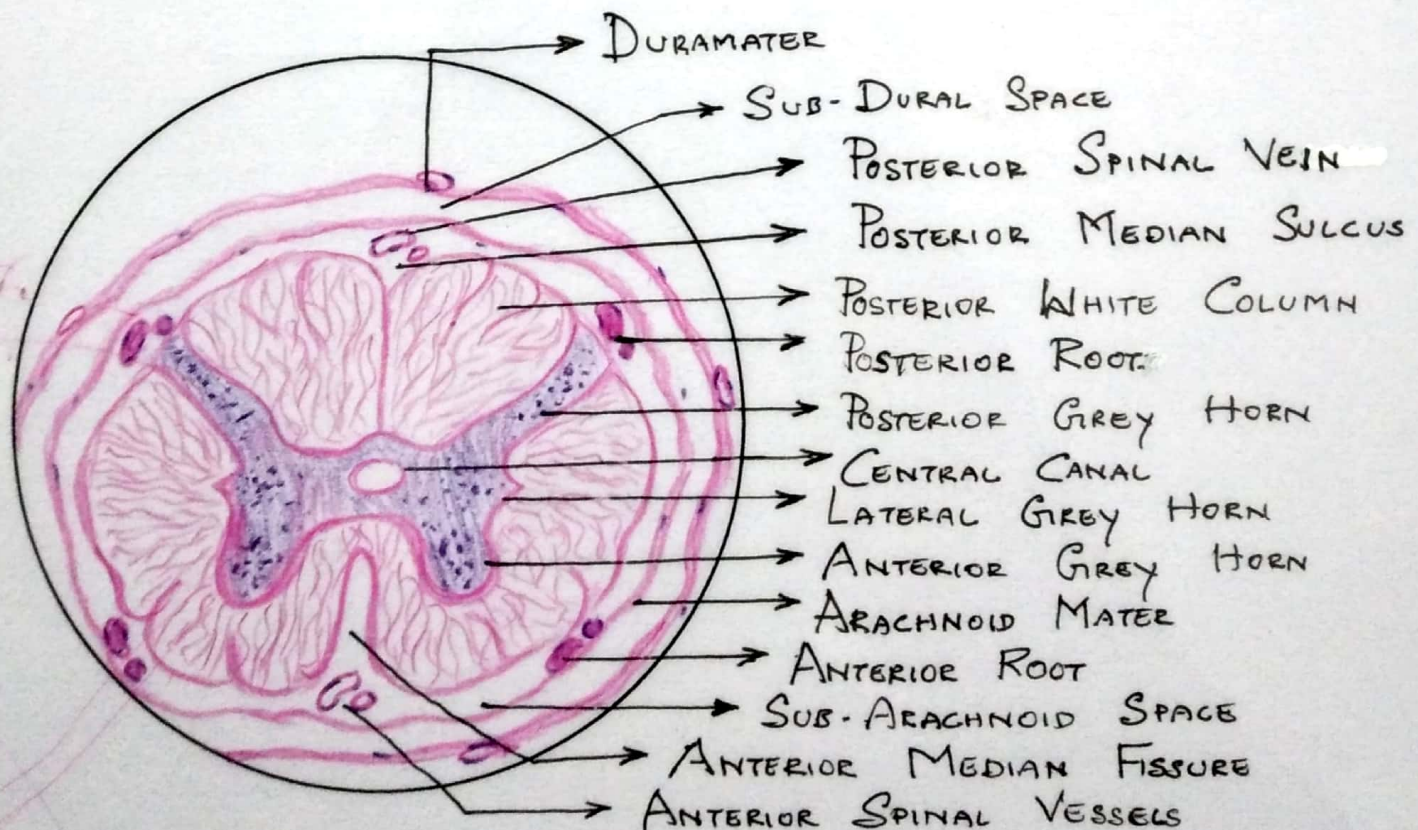
- Enclosed by an irregular connective tissue layer containing adipose cells, nerves and blood vessels.
- Numerous round pseudo-unipolar neurons with central round nucleus and well defined satellite cells.
- Myelinated nerve axons seen

NERVOUS SYSTEM: OPTIC NERVE



- Presence of the three meningeal layers.
- Central retinal vessels seen along with nerve fibre bundles.

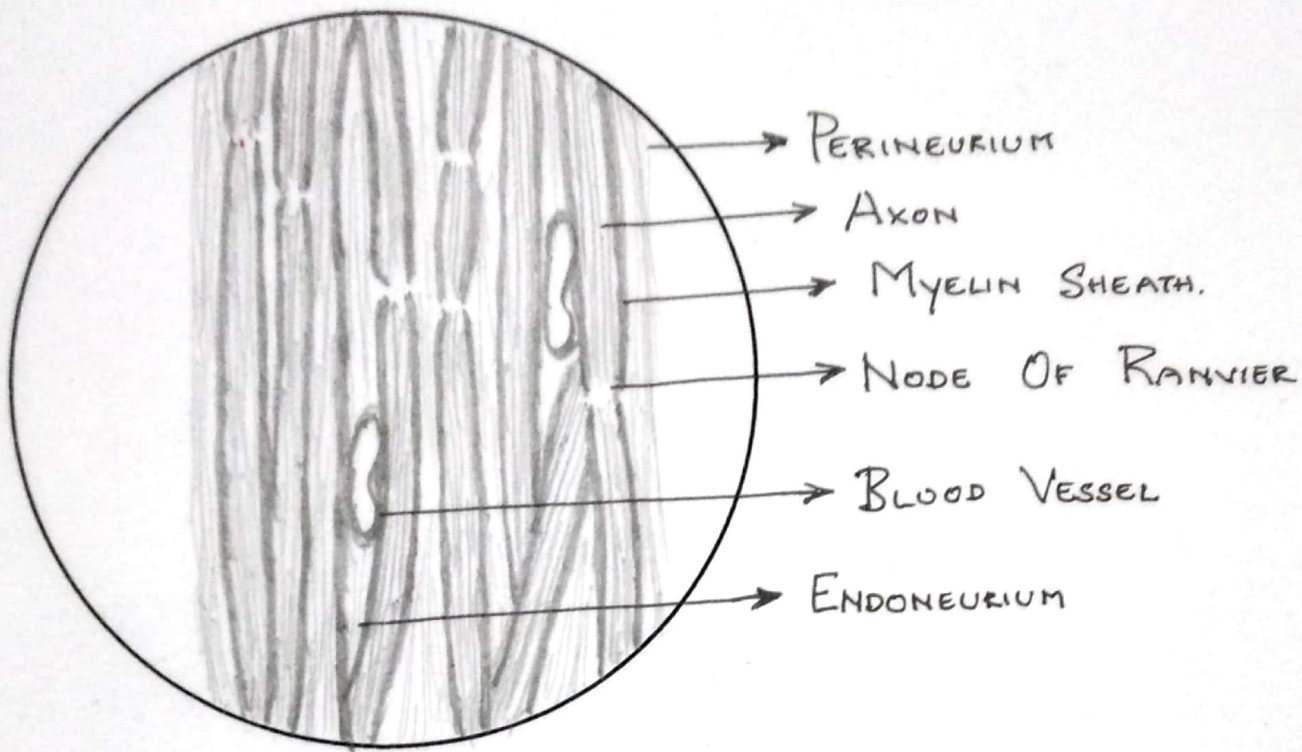
NERVOUS SYSTEM: SPINAL CORD



- Surrounded by meningeal layers.
- Outer white and inner H-shaped grey matter.
- Central canal is present.

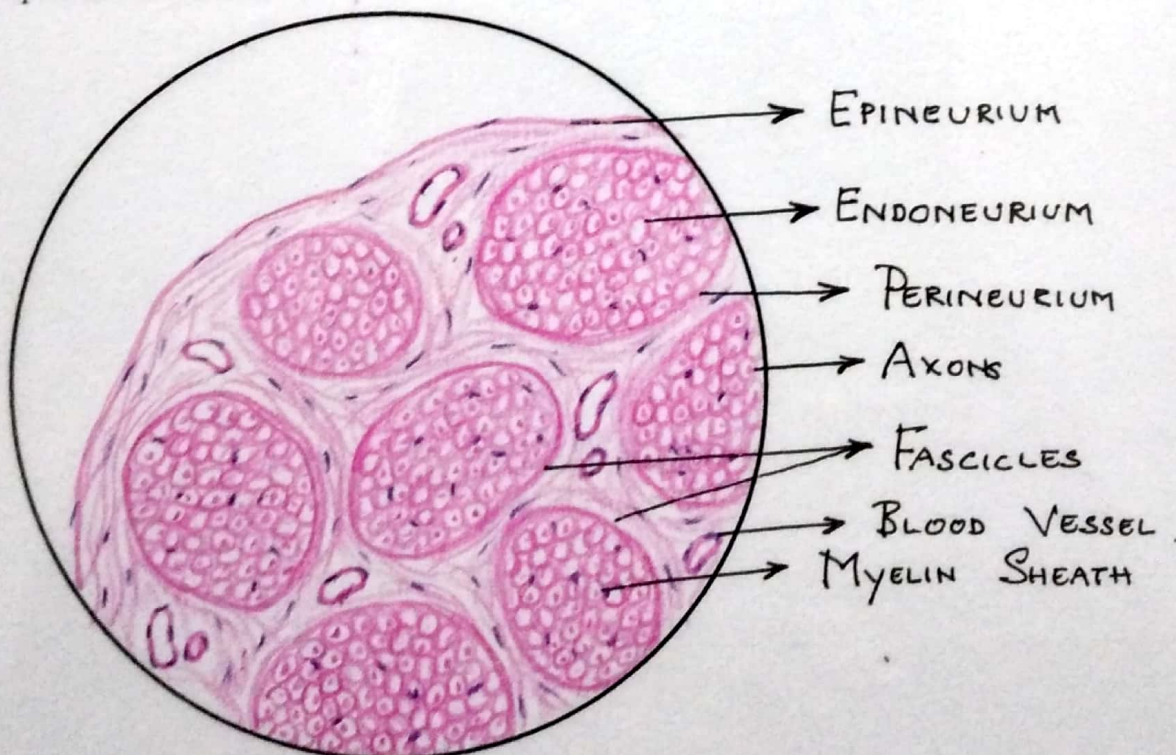
STUDY OF NERVOUS TISSUE

Peripheral nerve L.S



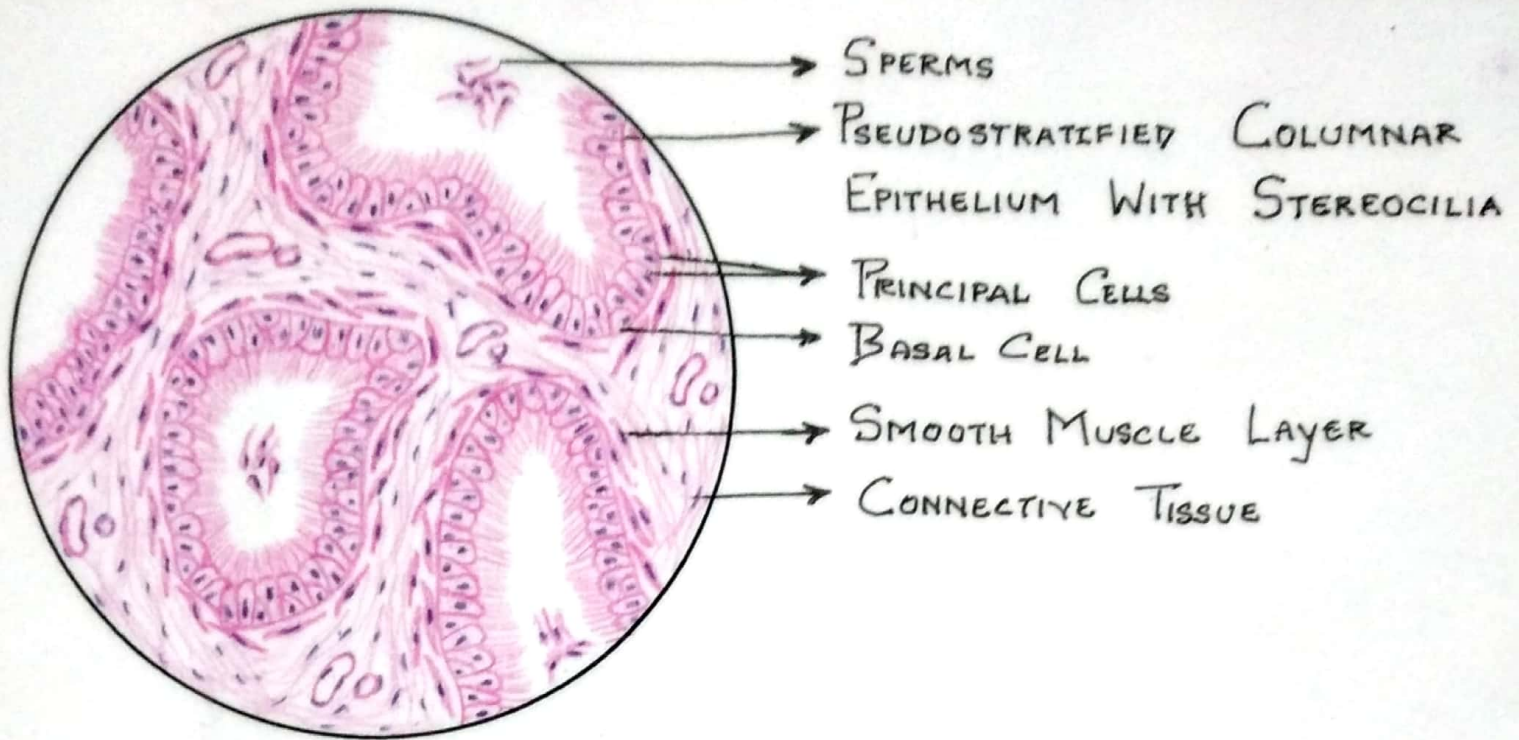
- Long cylindrical nerve fibres
- Myelin sheath surrounds the central axon.
- Regions of discontinuity represents the nodes of Ranvier

Peripheral nerve T.S



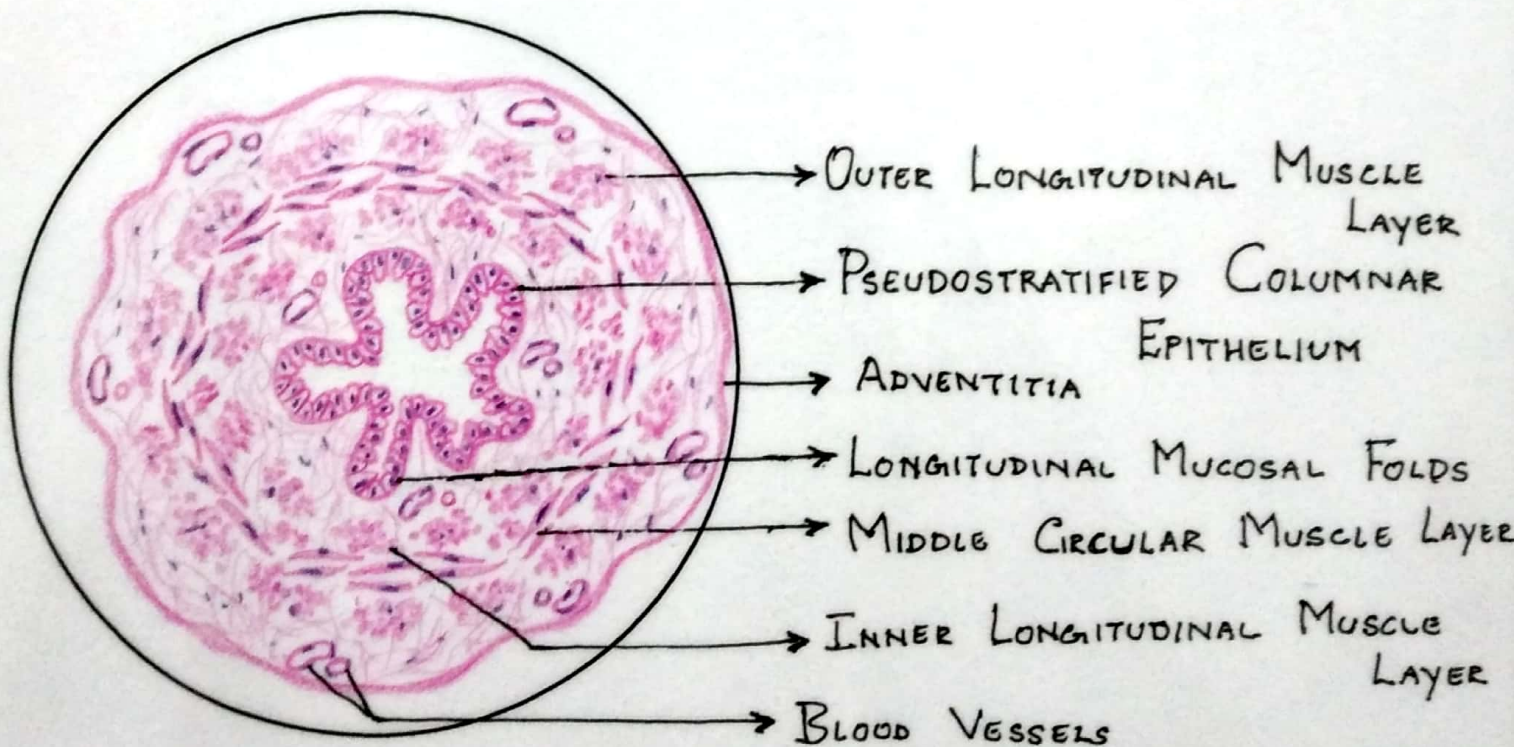
- Each nerve fascicle is surrounded by perineurium.
- Each individual nerve fibre or axon is surrounded by endoneurium
- Entire nerve is surrounded by dense connective tissue called epineurium

MALE REPRODUCTIVE SYSTEM: EPIDIDYMISS



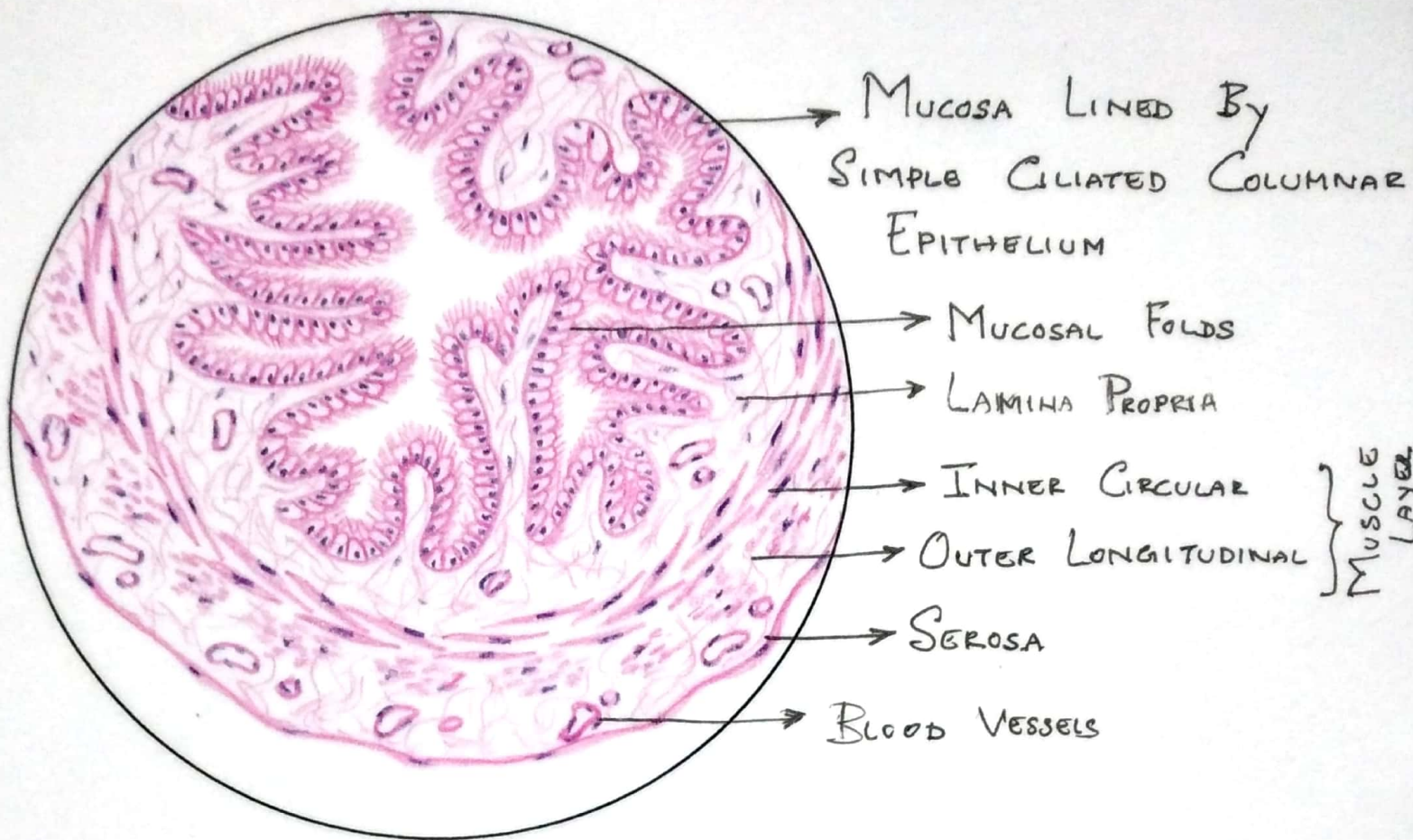
- Tubules lined by Pseudostratified Columnar epithelium
- Principal cells are tall columnar lined with stereocilia
- Sperms are seen in the tubular lumen
- A thin layer of smooth muscle surrounds each tubule

MALE REPRODUCTIVE SYSTEM: VAS DEFERENS



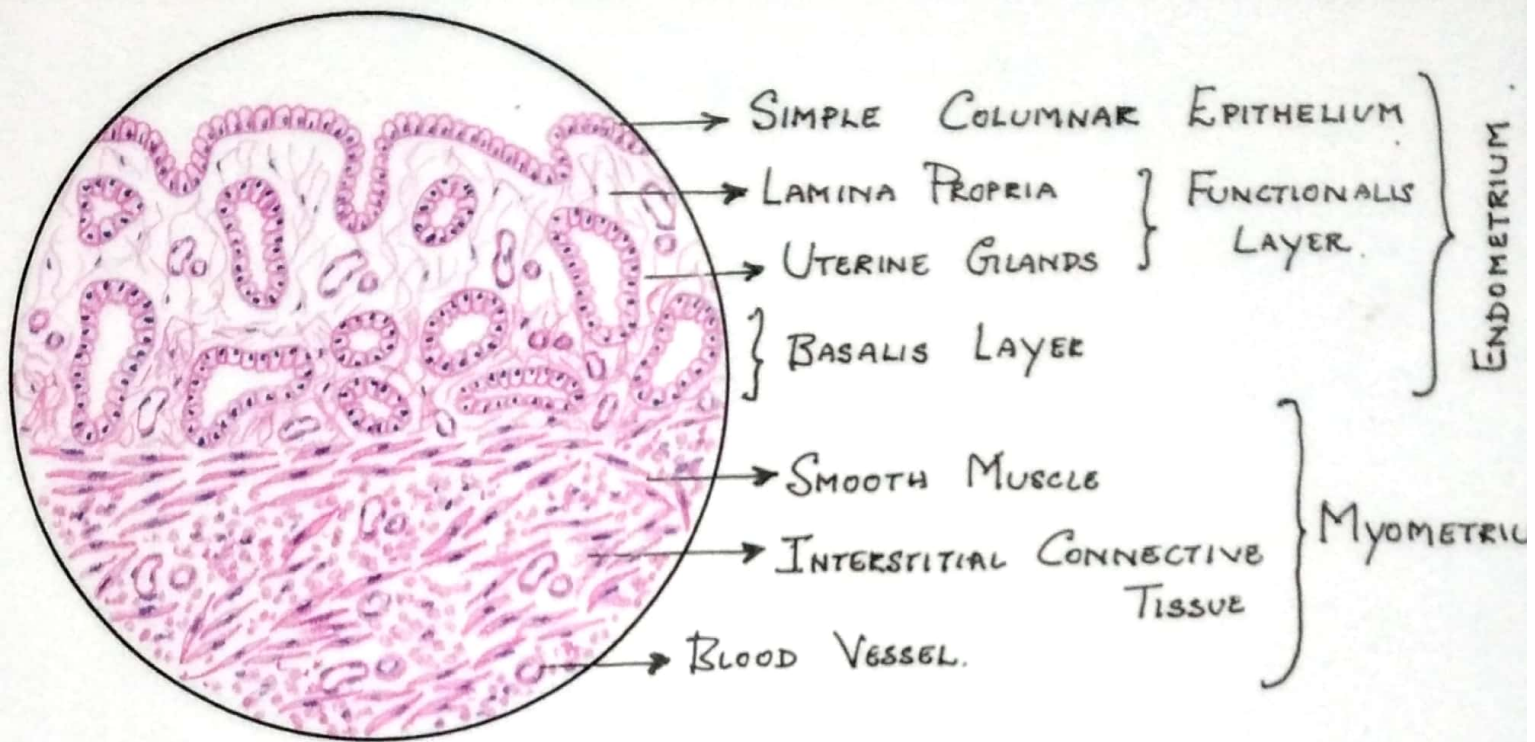
- Narrow irregular lumen lined by pseudostratified columnar epithelium with stereocilia
- Thick muscularis consists of thin inner longitudinal, thick middle circular and a thin outer longitudinal layer

FEMALE REPRODUCTIVE SYSTEM: FALLOPIAN TUBE



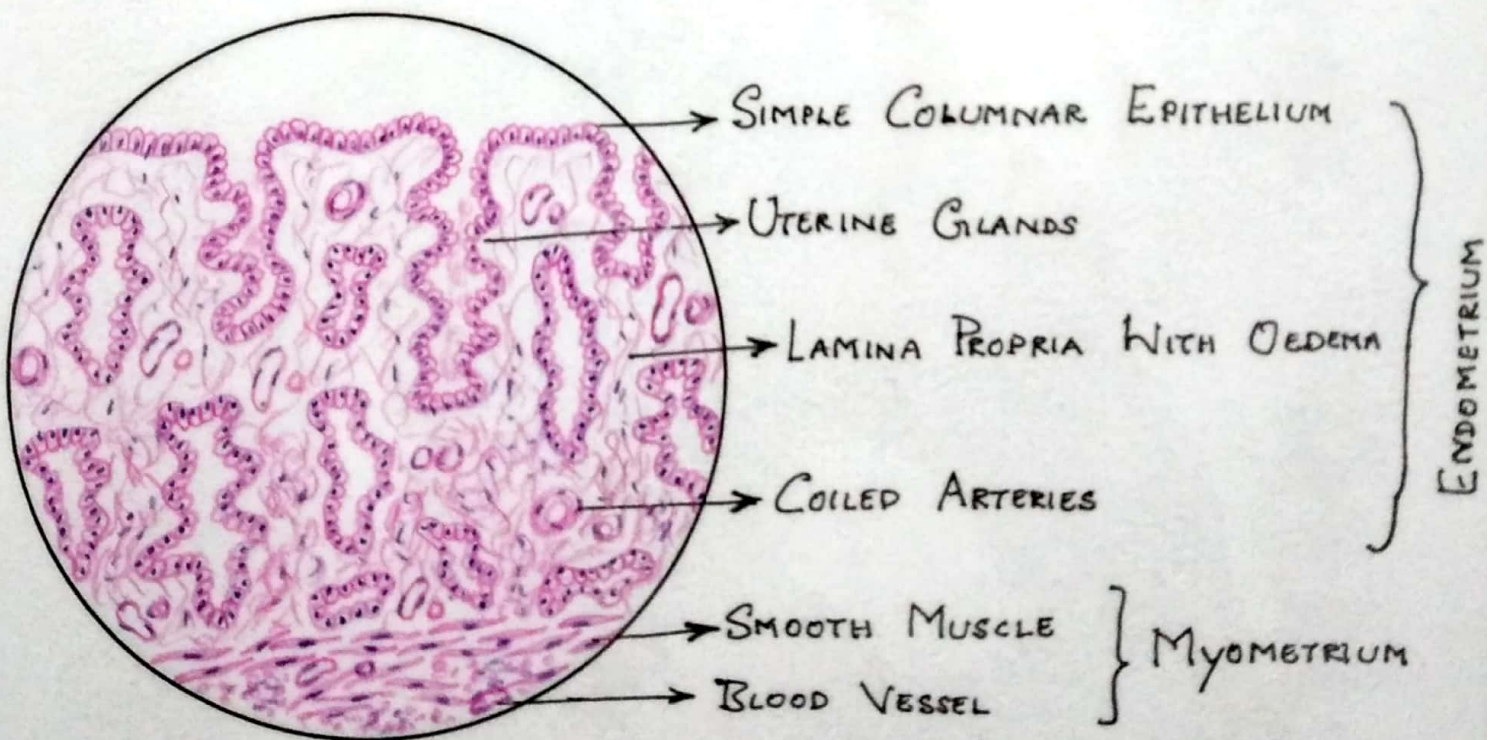
- Mucosa is lined by simple columnar ciliated and nociliated peg cells
- Mucosa is highly folded
- Muscularis consists of inner circular and outer longitudinal layer

FEMALE REPRODUCTIVE SYSTEM: UTERUS (PROLIFERATIVE PHASE)



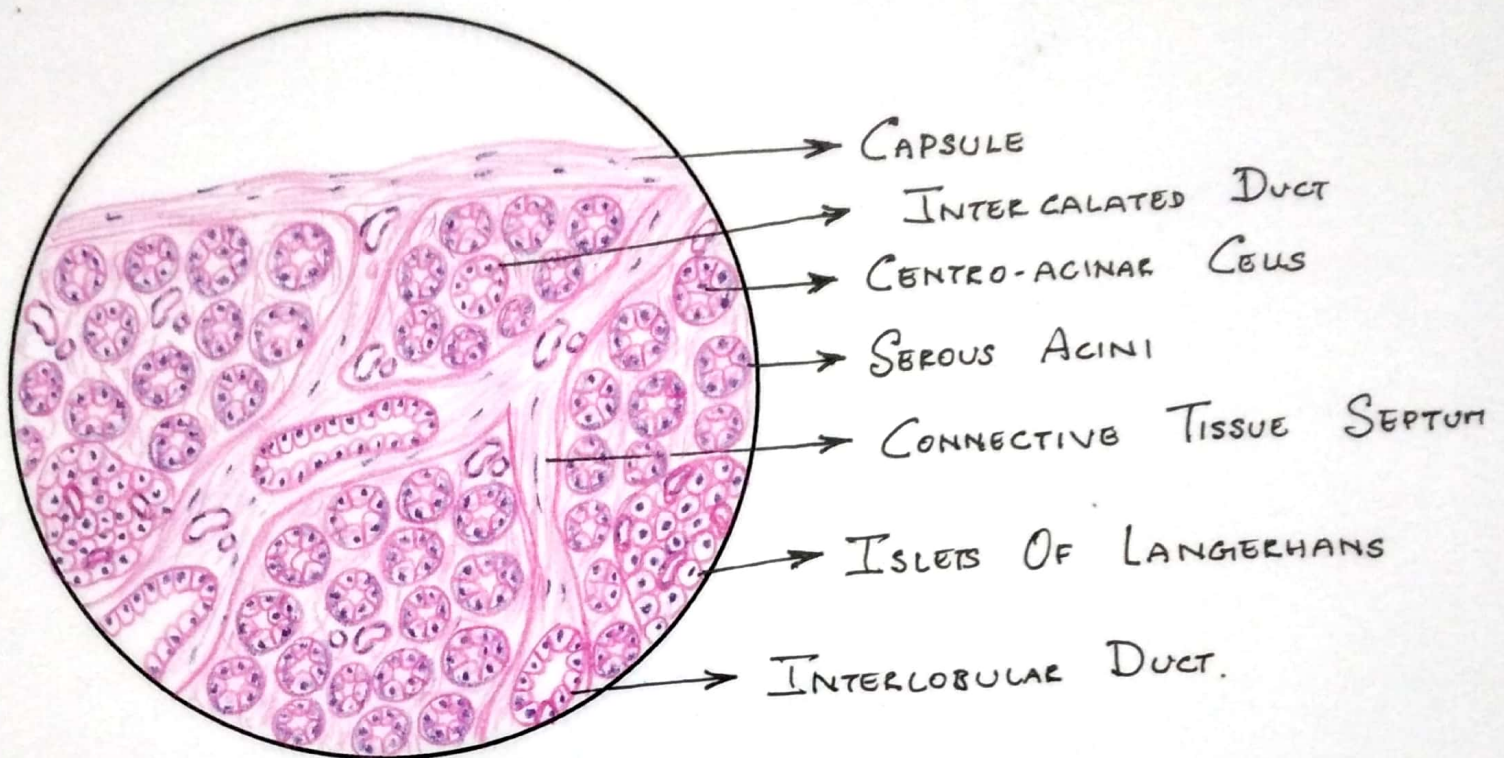
- Endometrium lined by Simple Columnar epithelium
- Lamina propria contains long tubular uterine glands
- Thick myometrium with numerous blood vessels

FEMALE REPRODUCTIVE SYSTEM: UTERUS (SECRETORY PHASE)



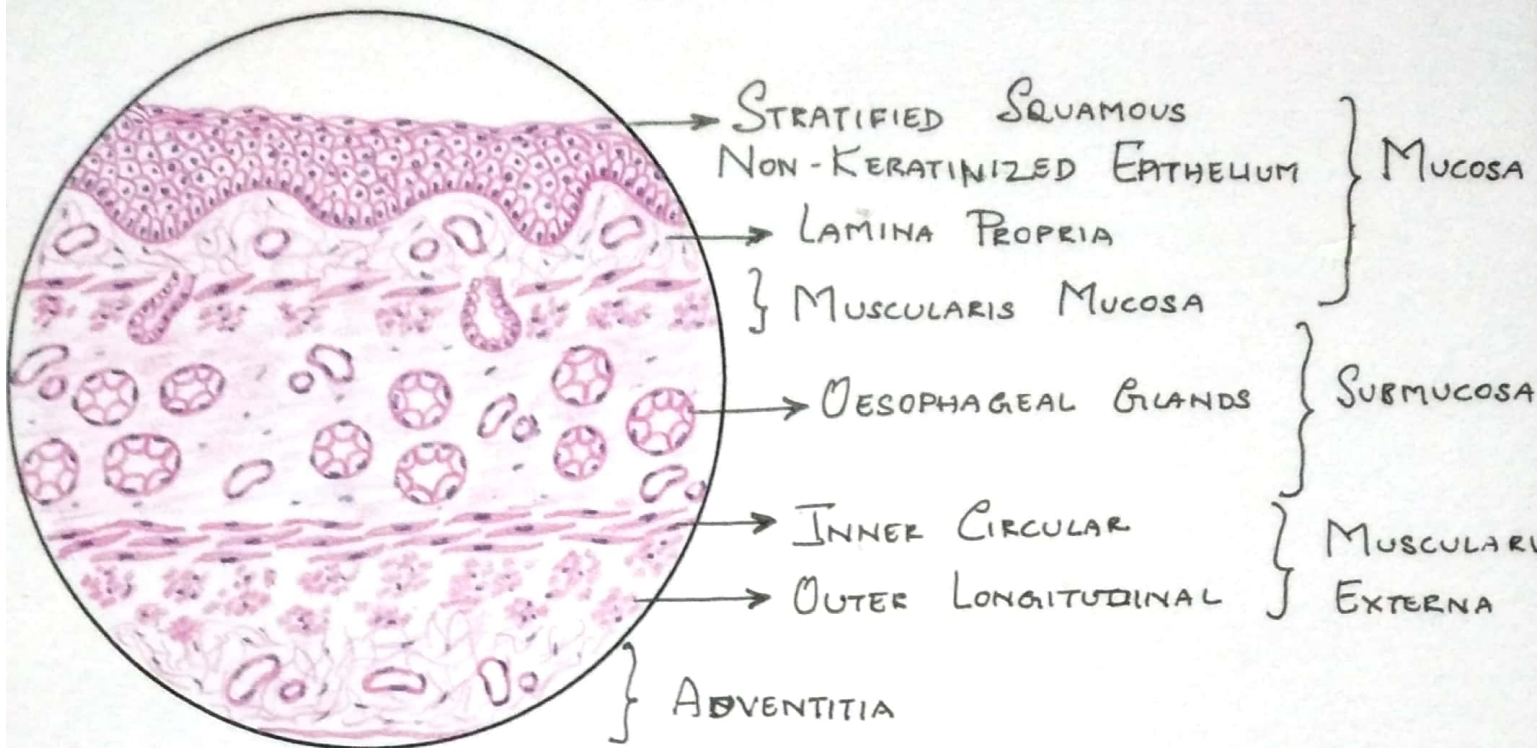
- Thick Endometrium lined by Simple Columnar epithelium
- Lamina propria contains tortuous uterine glands and coiled arteries
- Myometrium with numerous blood vessels

STUDY OF ENDOCRINE SYSTEM : PANCREAS



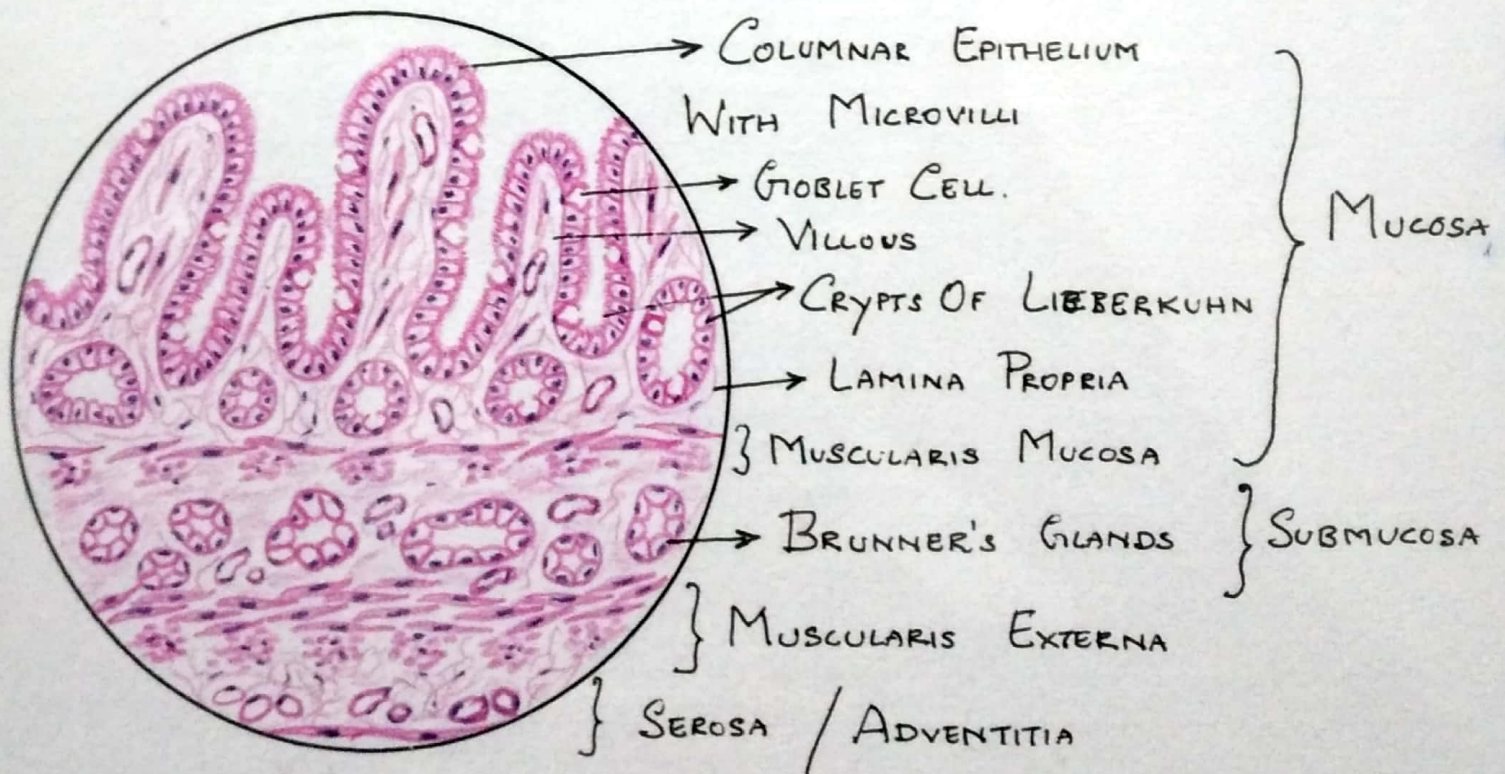
- Covered by thin capsule. septae divides the gland into lobules
- Numerous compactly arranged serous acini seen
- Islets of langerhans are present which form the endocrine part of the gland
- Interlobular ducts and certroacinar cell seen

GASTROINTESTINAL SYSTEM: OESOPHAGUS



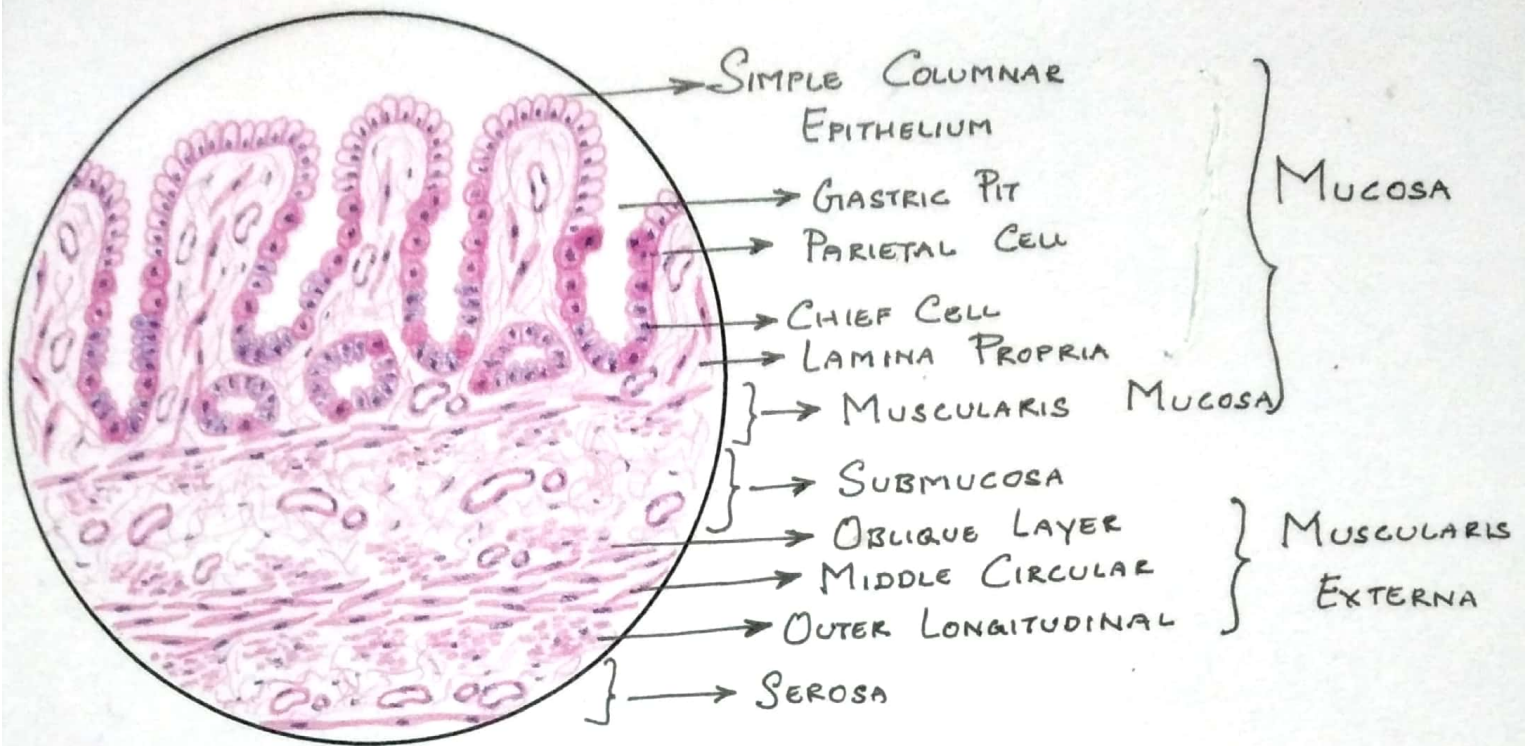
- Mucosa lined by stratified squamous non-keratinized epithelium.
- Submucosa contains oesophageal glands
- Muscularis externa contains inner circular & outer longitudinal muscle layer.

GASTROINTESTINAL SYSTEM: DUODENUM



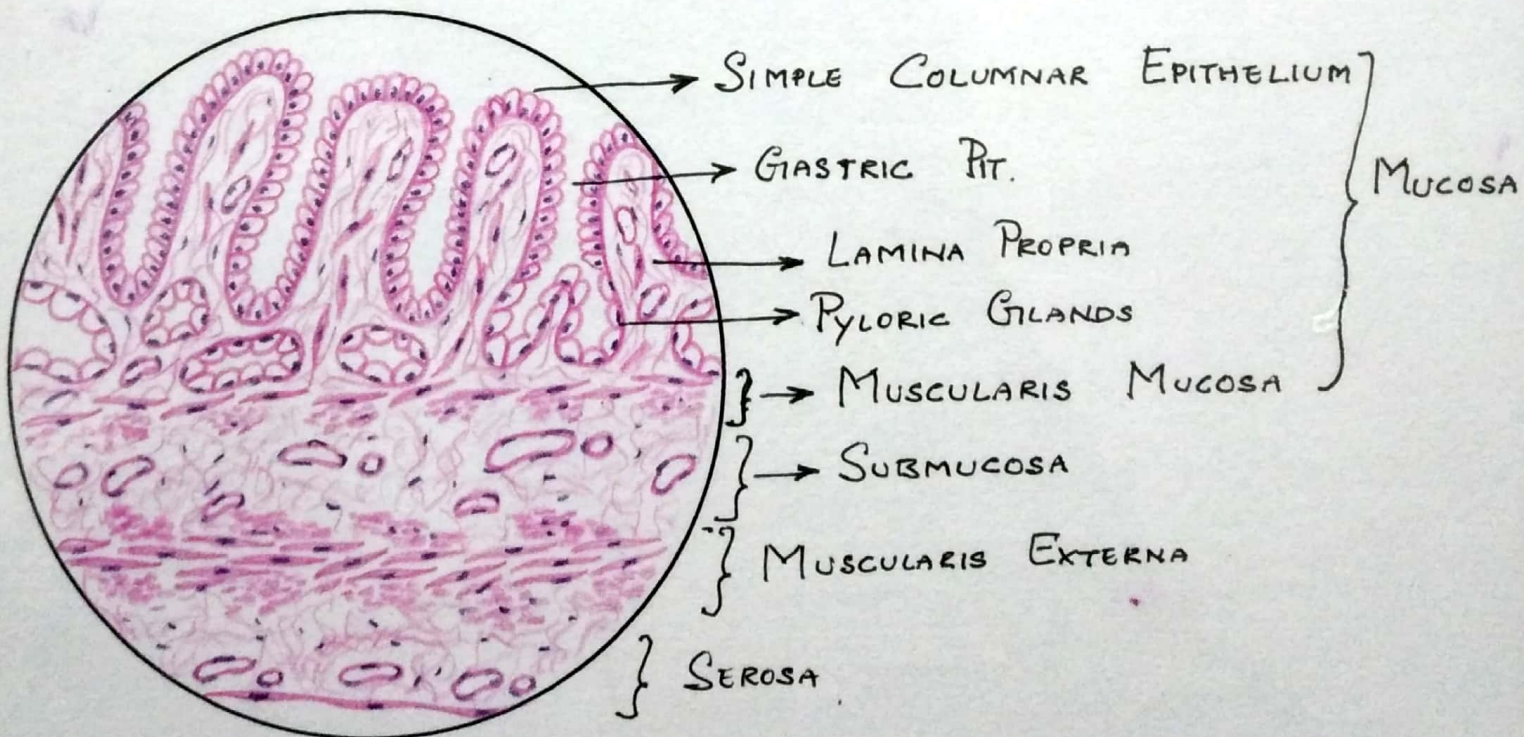
- Mucosa lined by simple columnar epithelium with microvilli and few goblet cells.
- Fingerlike villi
- Brunner's glands seen in the submucosa
- Myenteric (Auerbach) nerve plexus seen between the two muscle layers of Muscularis externa.

GASTROINTESTINAL SYSTEM: STOMACH (FUNDUS)



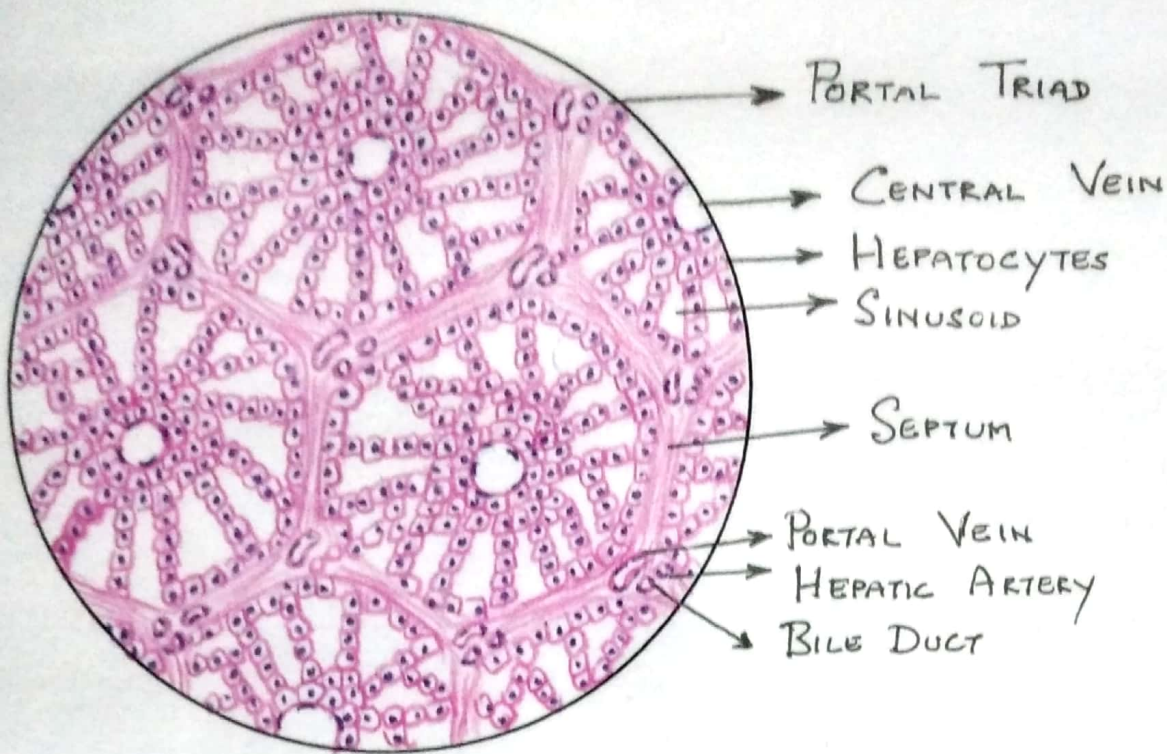
- Mucosa lined by simple columnar epithelium.
- Shallow gastric pits
- Numerous chief & parietal cells seen in the lamina propria
- Muscularis externa contains inner oblique, middle circular & outer longitudinal muscle layer.

GASTROINTESTINAL SYSTEM: STOMACH (PYLORUS)



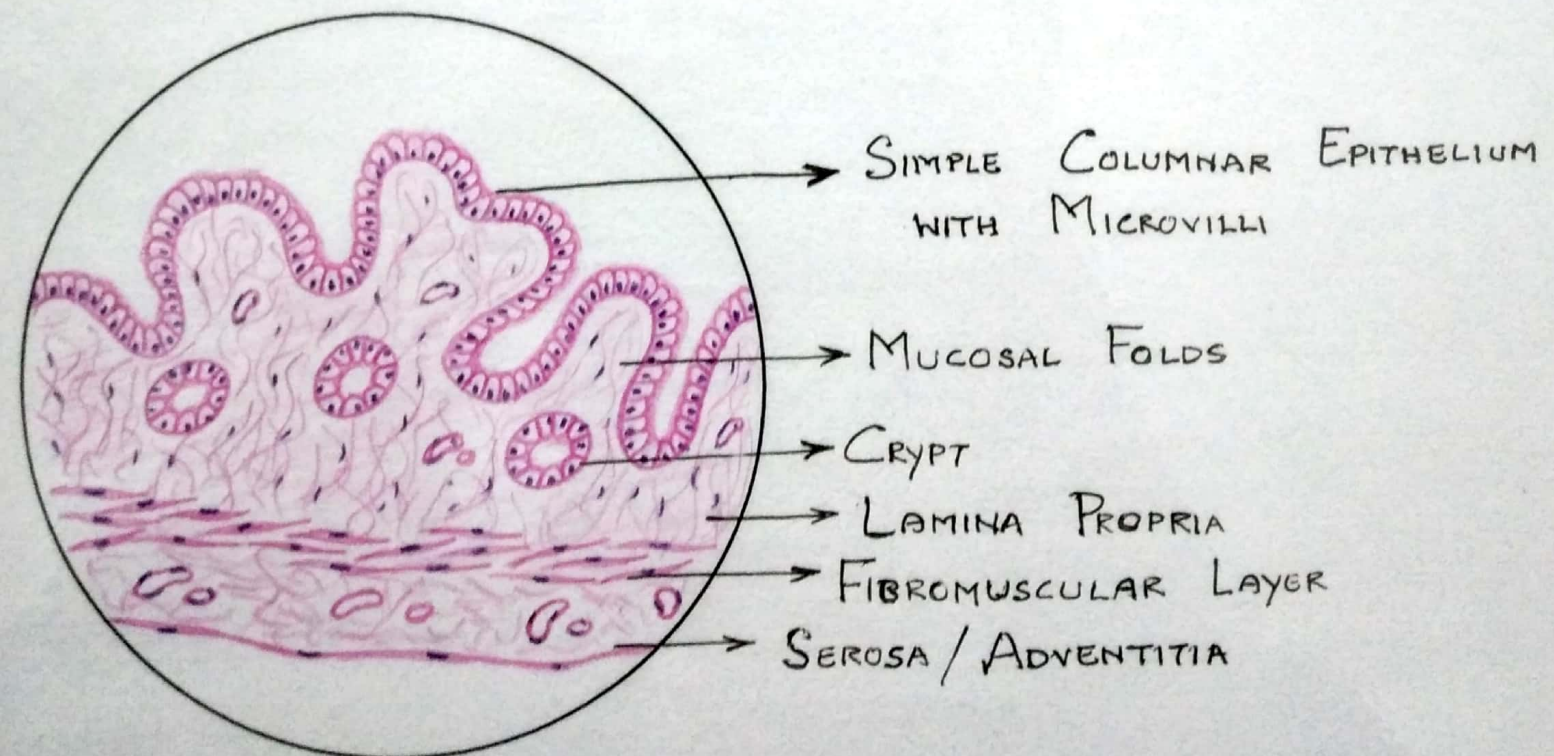
- Mucosa lined by simple columnar epithelium.
- Deep gastric pits
- Pyloric glands seen in the lamina propria
- Muscularis externa contains thick middle circular layer which forms pyloric sphincter.

GASTROINTESTINAL SYSTEM: LIVER



- Hepatic lobules with central vein
- Plates of hepatic cells radiating from the central vein towards the periphery of the lobule.
- Portal triad seen in the interlobular septa.

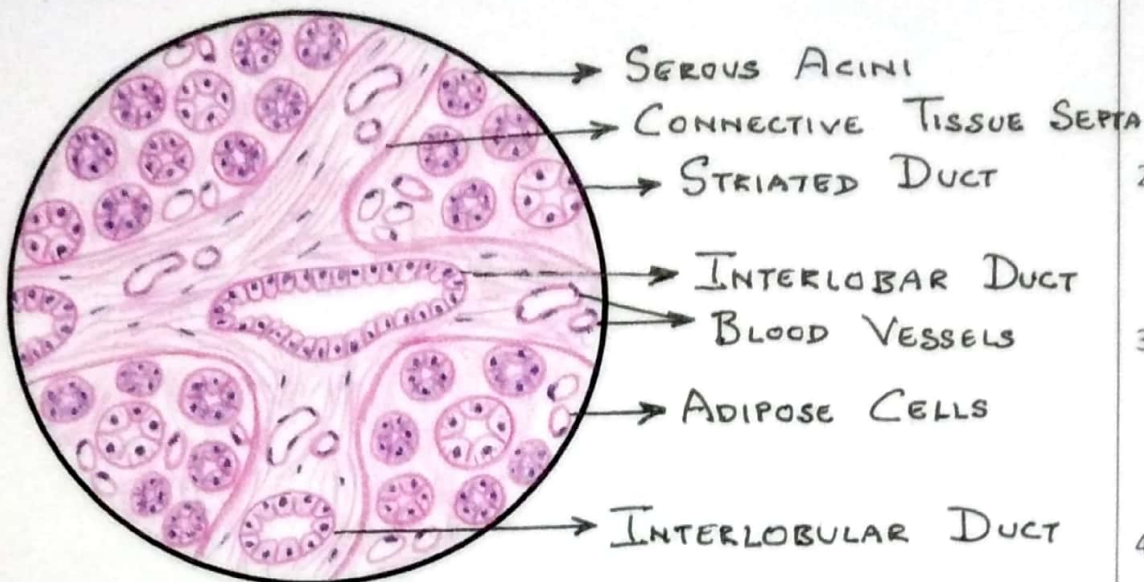
GASTROINTESTINAL SYSTEM: GALLBLADDER



- Mucosa lined by simple columnar epithelium.
- Muscularis mucosae and submucosa are absent.
- Muscularis consists of randomly oriented smooth muscle fibres and interlacing elastic fibres.

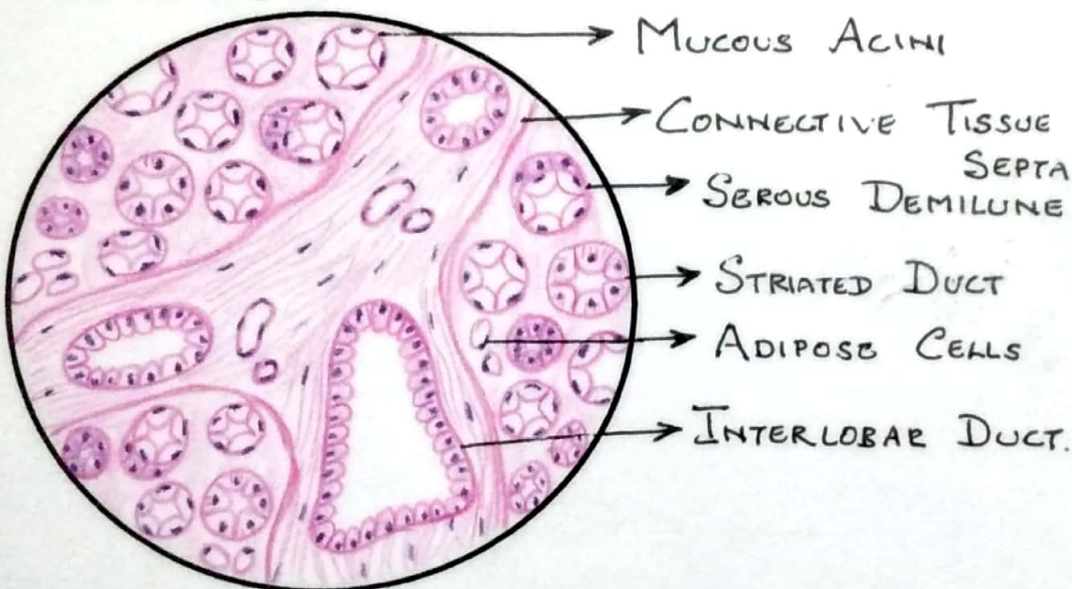
STUDY OF GLANDS

Serous salivary gland



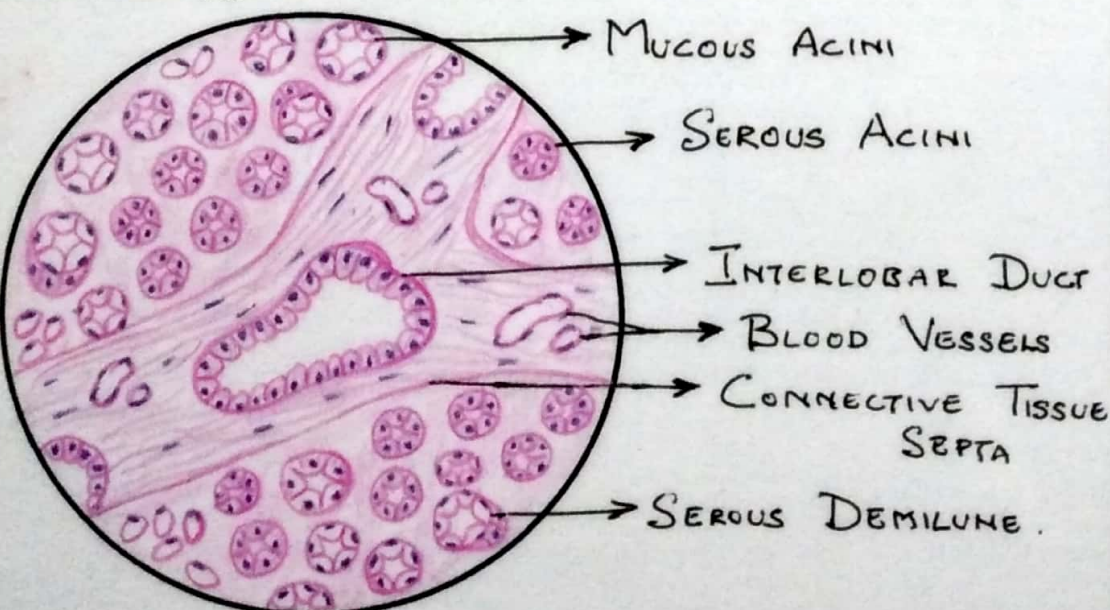
1. Surrounded by capsule which forms interlobular connective tissue septa that subdivide the gland into lobes and lobules.
2. Consists of serous acini with narrow lumen and centrally placed round nuclei
3. Well developed duct system with intercalated, striated, intralobular, interlobular & interlobar ducts seen
4. Ex: parotid gland

Mucous salivary gland



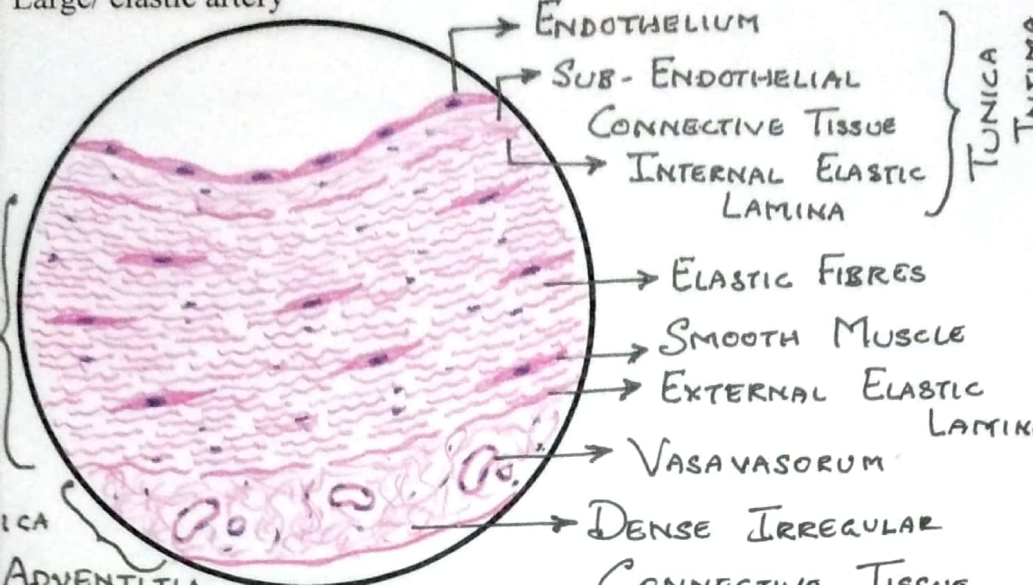
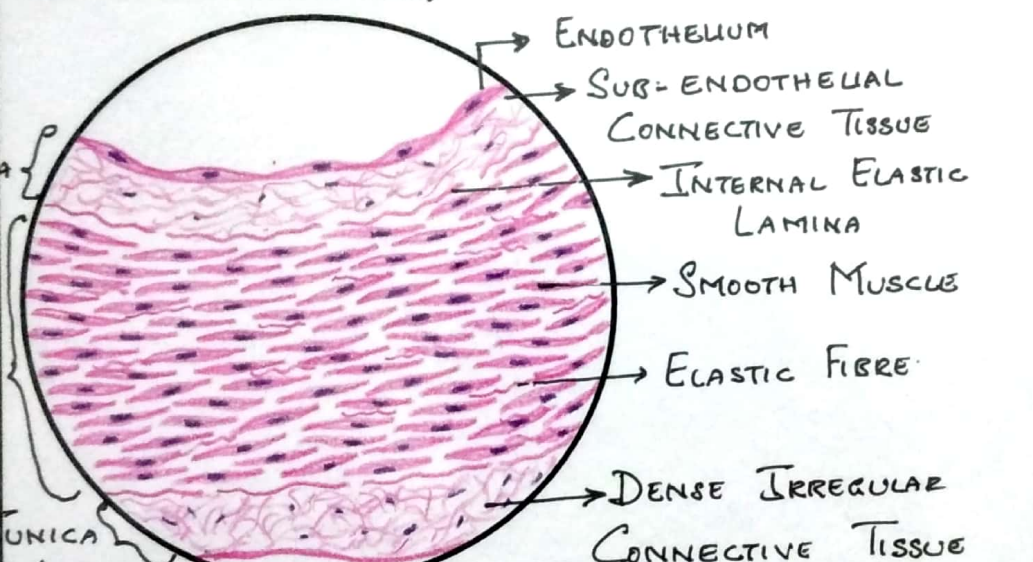
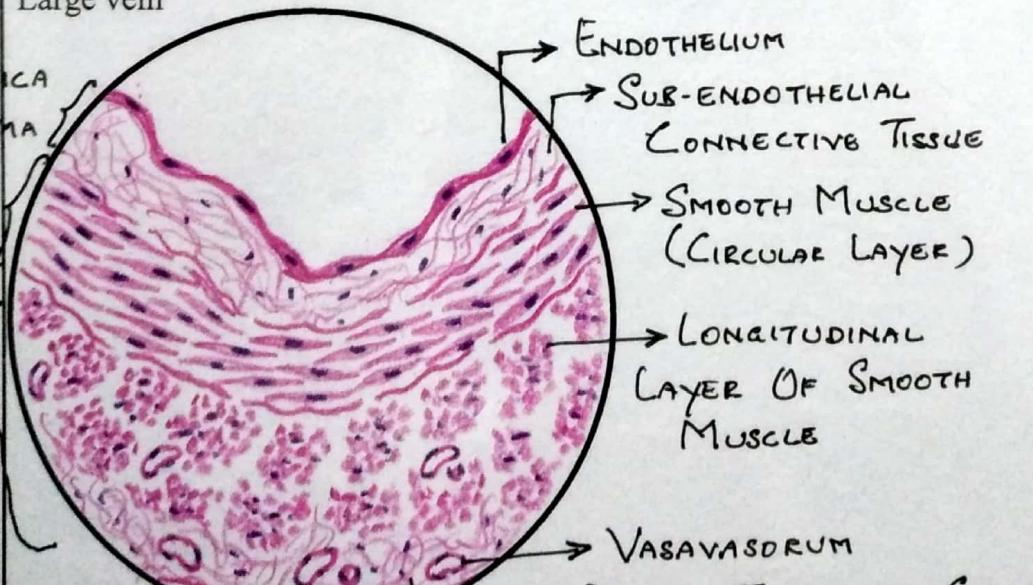
1. Surrounded by capsule which forms interlobular connective tissue septa that subdivide the gland into lobes and lobules.
2. Consists of mucous acini with wider lumen and flattened basal nuclei
3. ~~Serous demilunes seen~~
4. Duct system is poorly developed
5. Ex: sublingual gland

Mixed salivary gland



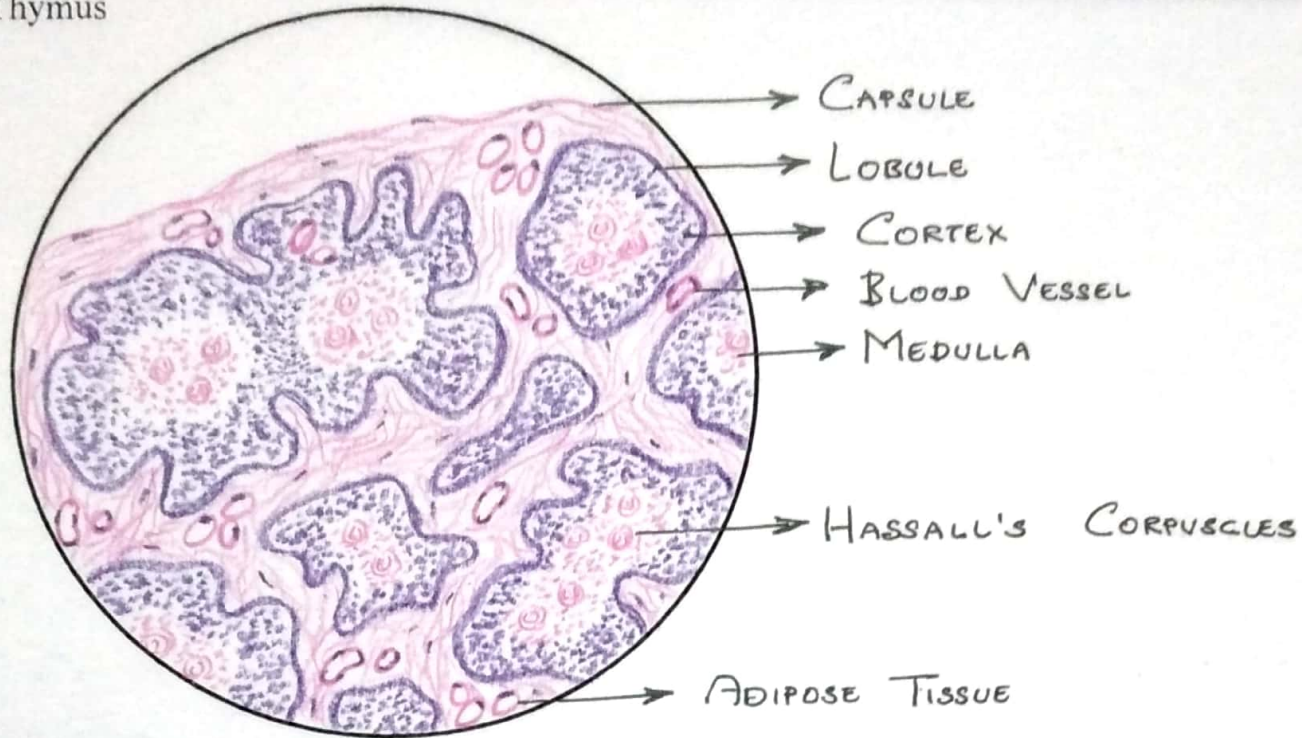
1. Surrounded by capsule which forms interlobular connective tissue septa that subdivide the gland into lobes and lobules.
2. Consists of both serous and mucous acini
3. Well developed duct system with intercalated, striated, intralobular, interlobular & interlobar ducts seen
4. Ex: submandibular gland
5. Serous demilunes seen

STUDY OF BLOOD VESSELS

Large/ elastic artery  Tunica Intima: Endothelium, Sub-Endothelial Connective Tissue, Internal Elastic Lamina. Tunica Media: Elastic Fibres, Smooth Muscle, External Elastic Lamina. Tunica Adventitia: Vasa Vasorum, Dense Irregular Connective Tissue.	1. Consists of tunica intima, tunica media and tunica adventitia 2. Tunica intima is lined by endothelium 3. Tunica media is thick & rich in elastic fibres 4. Tunica adventitia contains vasa vasorum 5. Internal elastic lamina is not prominent
Medium sized/ muscular artery  Tunica Intima: Endothelium, Sub-Endothelial Connective Tissue, Internal Elastic Lamina. Tunica Media: Smooth Muscle, Elastic Fibre. Tunica Adventitia: Dense Irregular Connective Tissue.	1. Consists of tunica intima, tunica media and tunica adventitia 2. Tunica intima is lined by endothelium 3. Tunica media is thick & rich in smooth muscle which is arranged in a circular layer 4. Tunica adventitia does not contain vasa vasorum 5. Internal elastic lamina is prominent
Large vein  Tunica Intima: Endothelium, Sub-Endothelial Connective Tissue. Tunica Media: Smooth Muscle (Circular Layer), Longitudinal Layer Of Smooth Muscle. Tunica Adventitia: Vasa Vasorum, Dense Irregular Connective Tissue.	1. Consists of tunica intima, tunica media and tunica adventitia 2. Tunica intima is lined by endothelium 3. Tunica media is thin & consists of circular layer of smooth muscle 4. Tunica adventitia is thick and consists of longitudinal layer of smooth muscle and vasa vasorum

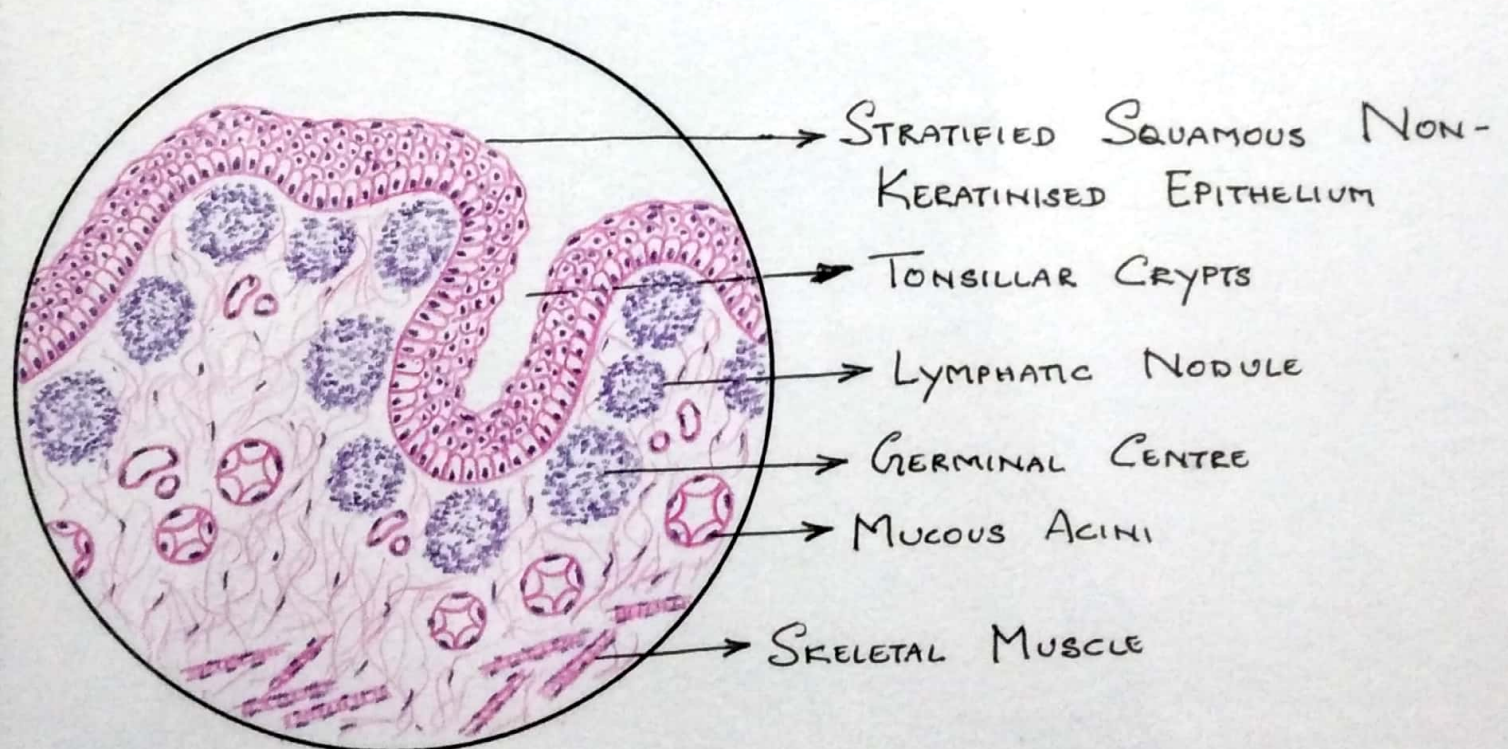
STUDY OF LYMPHATIC SYSTEM

Thymus



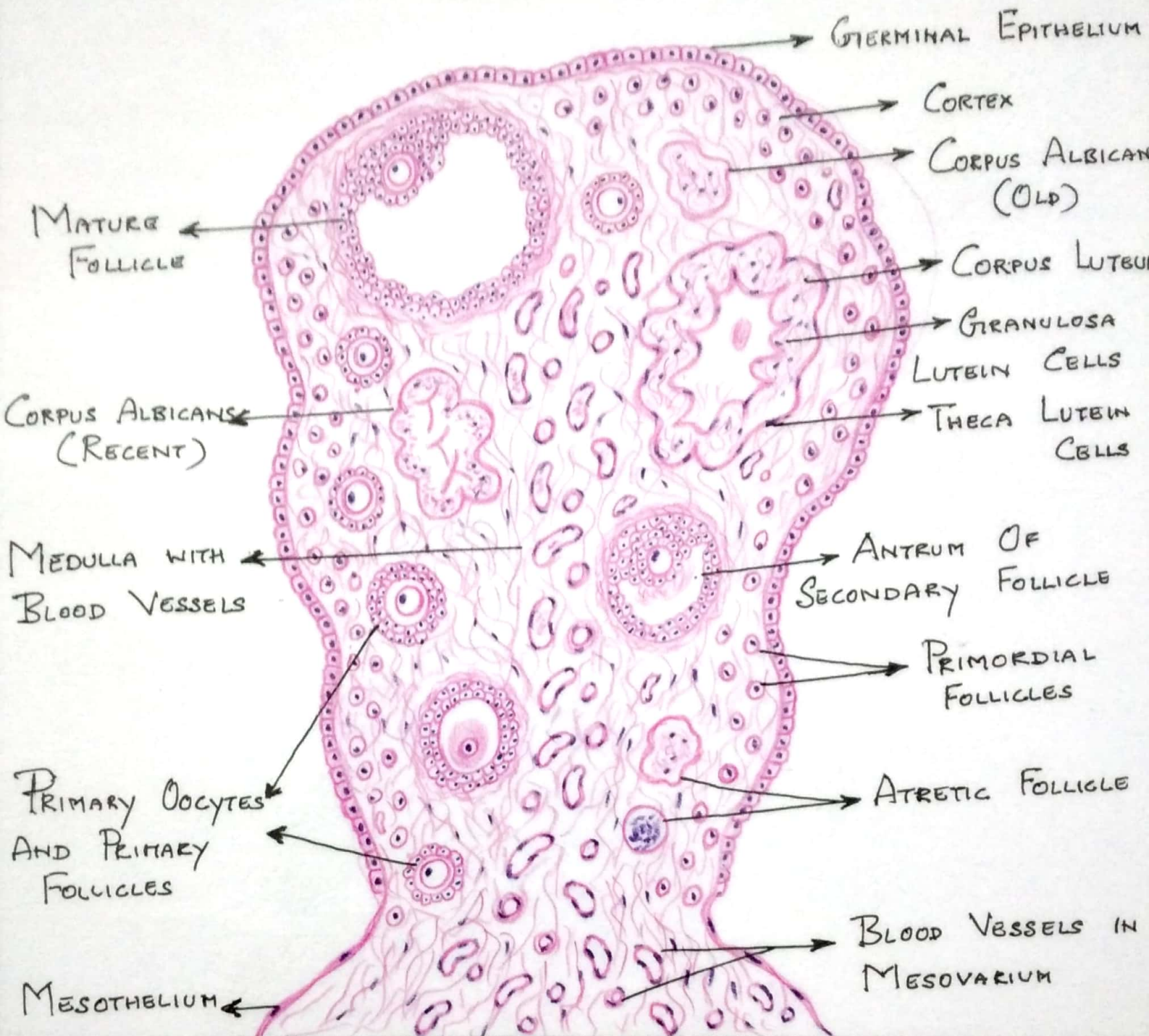
- Covered by capsule which give rise to trabeculae
- Trabeculae subdivides the gland into incomplete lobules
- Each lobule consists of cortex & medulla
- Hassall corpuscles seen in the medulla

Palatine tonsil



- Lined by stratified squamous nonkeratinized epithelium
- Deep tonsillar crypts seen
- Lymphatic nodules with germinal centre present

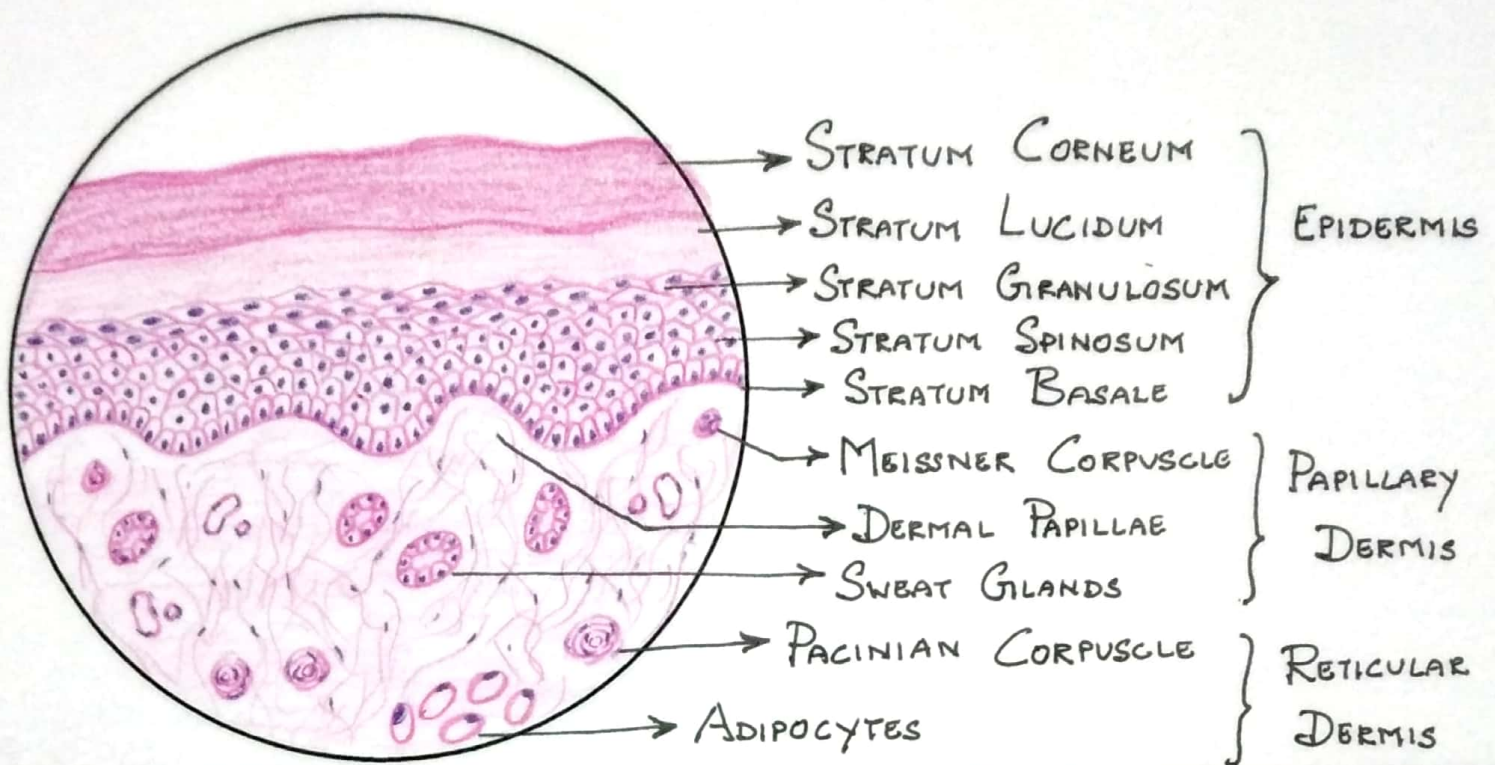
FEMALE REPRODUCTIVE SYSTEM: OVARY



- Lined by a single layer of low cuboidal or squamous cells called the germinal epithelium
- Has peripheral cortex and a central medulla
- Ovarian follicles in various stages of development are seen in the cortex
- Blood vessels, nerves and lymphatics are seen in the medulla

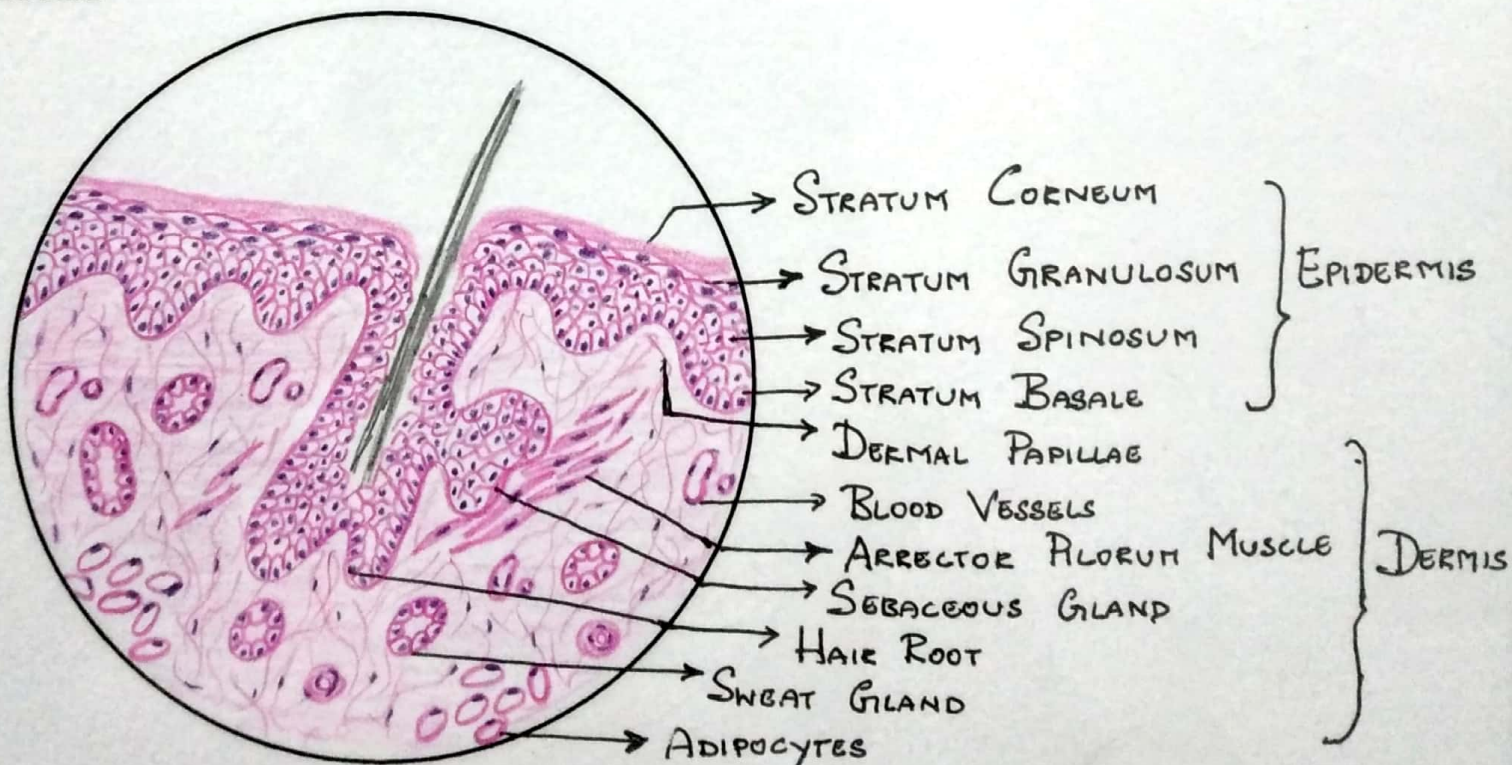
STUDY OF INTEGUMENTARY SYSTEM

Thick Skin



- Consists of epidermis and dermis
- Thick epidermis lined by stratified squamous keratinized epithelium
- Epidermis consists of five layers.
- Prominent dermal & epidermal papillae and absence of hair follicles

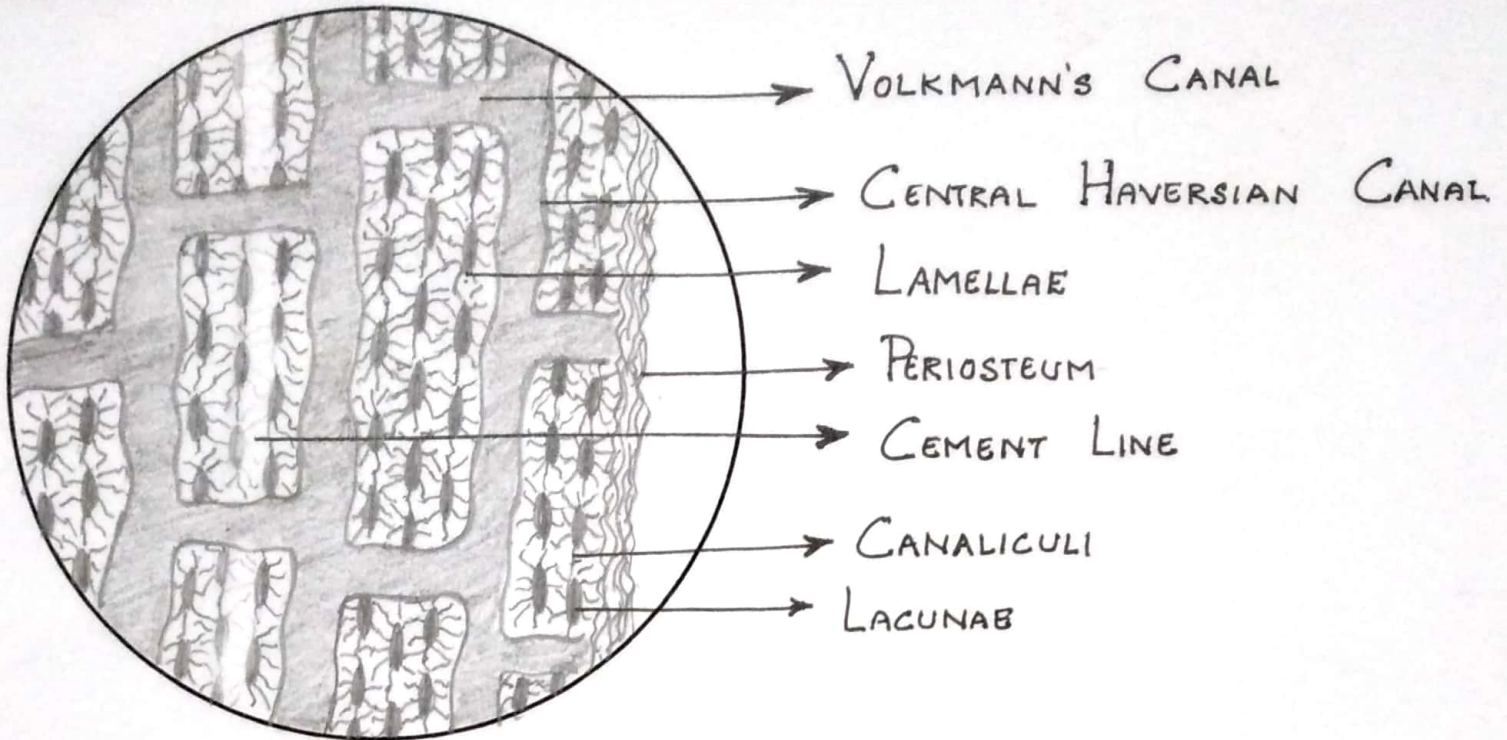
Thin skin



- Consists of epidermis and dermis
- Thin epidermis lined by stratified squamous non-keratinized epithelium
- Epidermis consists of four layers. Stratum lucidum is absent
- Unmarked dermal & epidermal papillae and presence of hair follicles & sebaceous glands

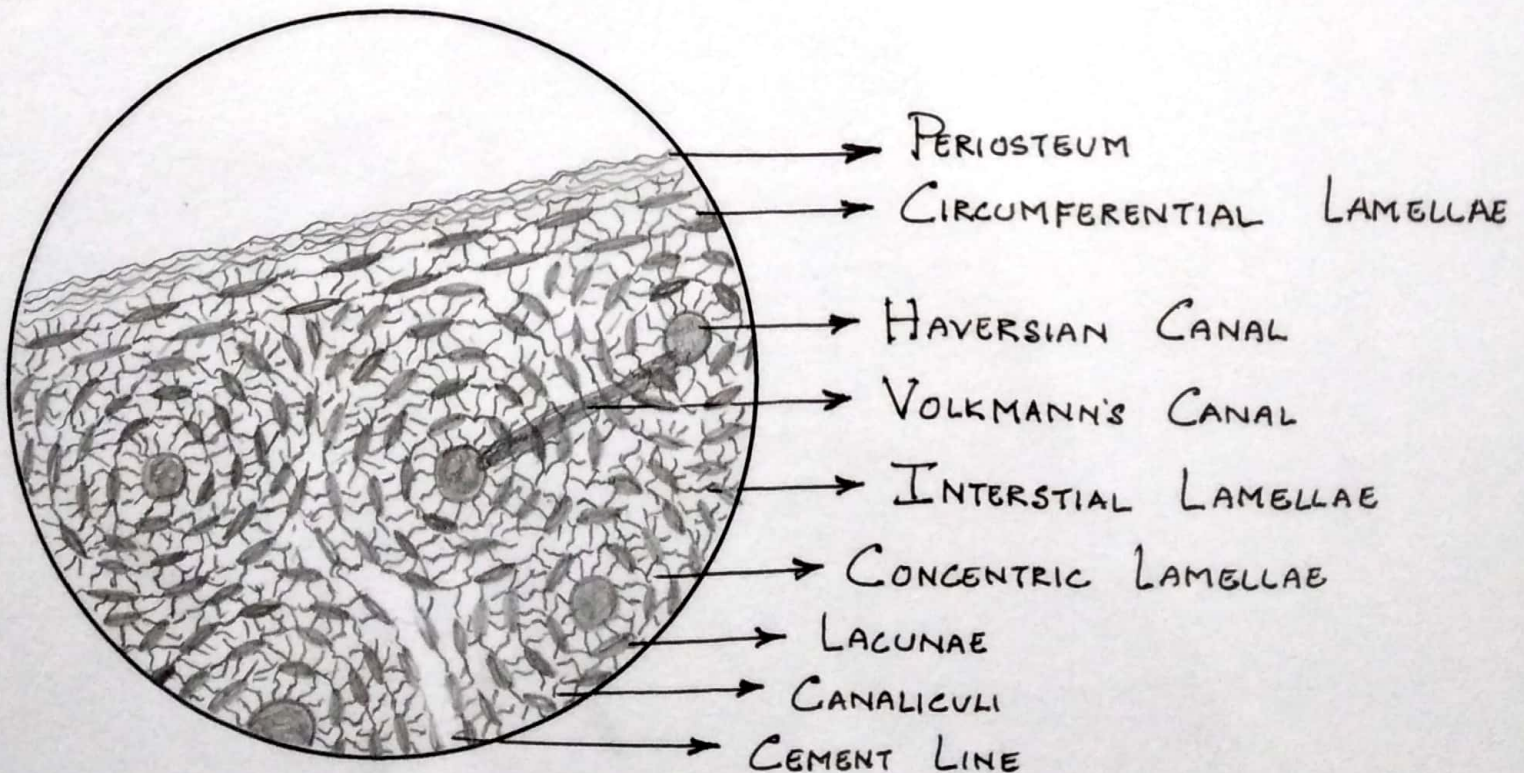
STUDY OF BONE TISSUE

Bone L.S



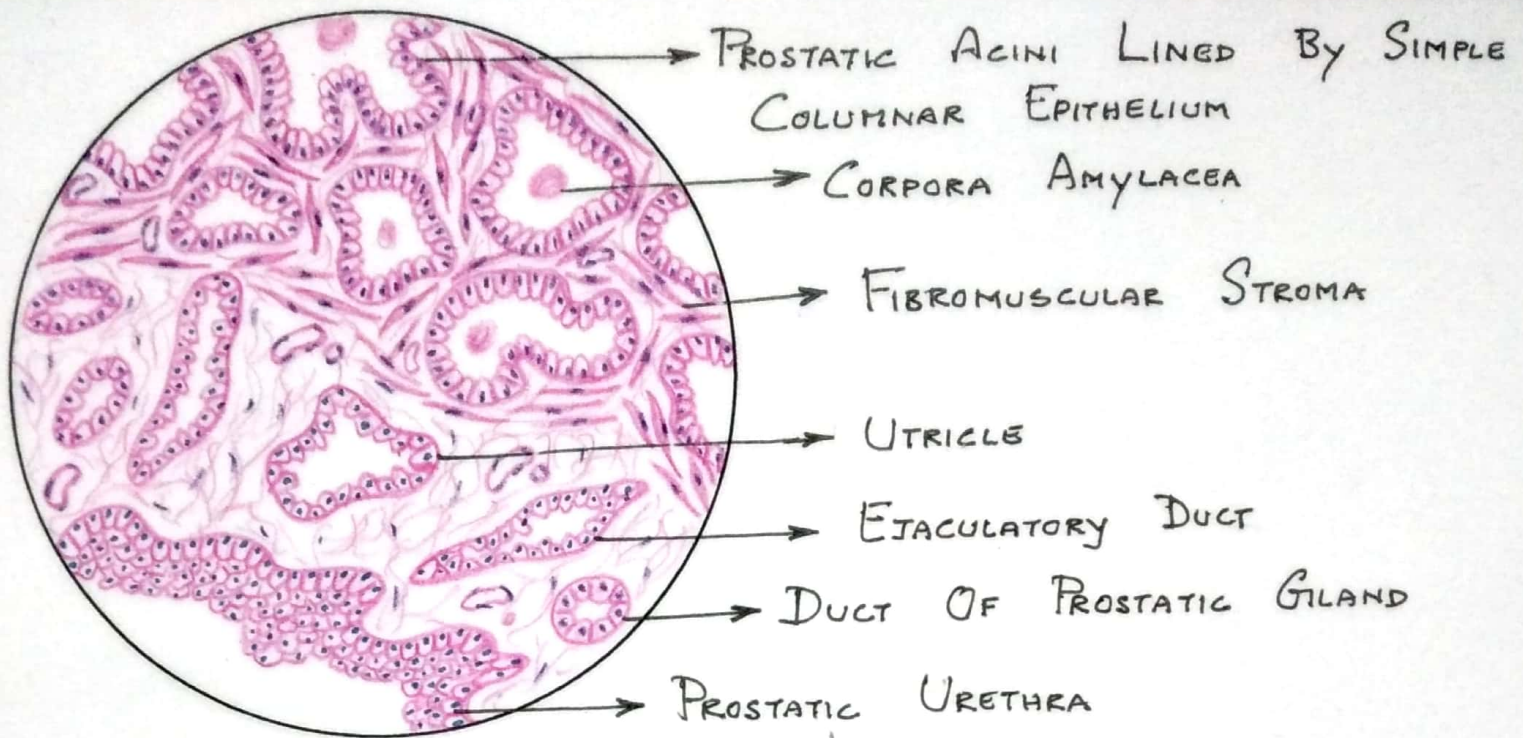
- Longitudinal section of central/Haversian canal surrounded by lamellae with lacunae and radiating canaliculi.
- Transverse or oblique section of perforating/Volkmann canals

Bone T.S



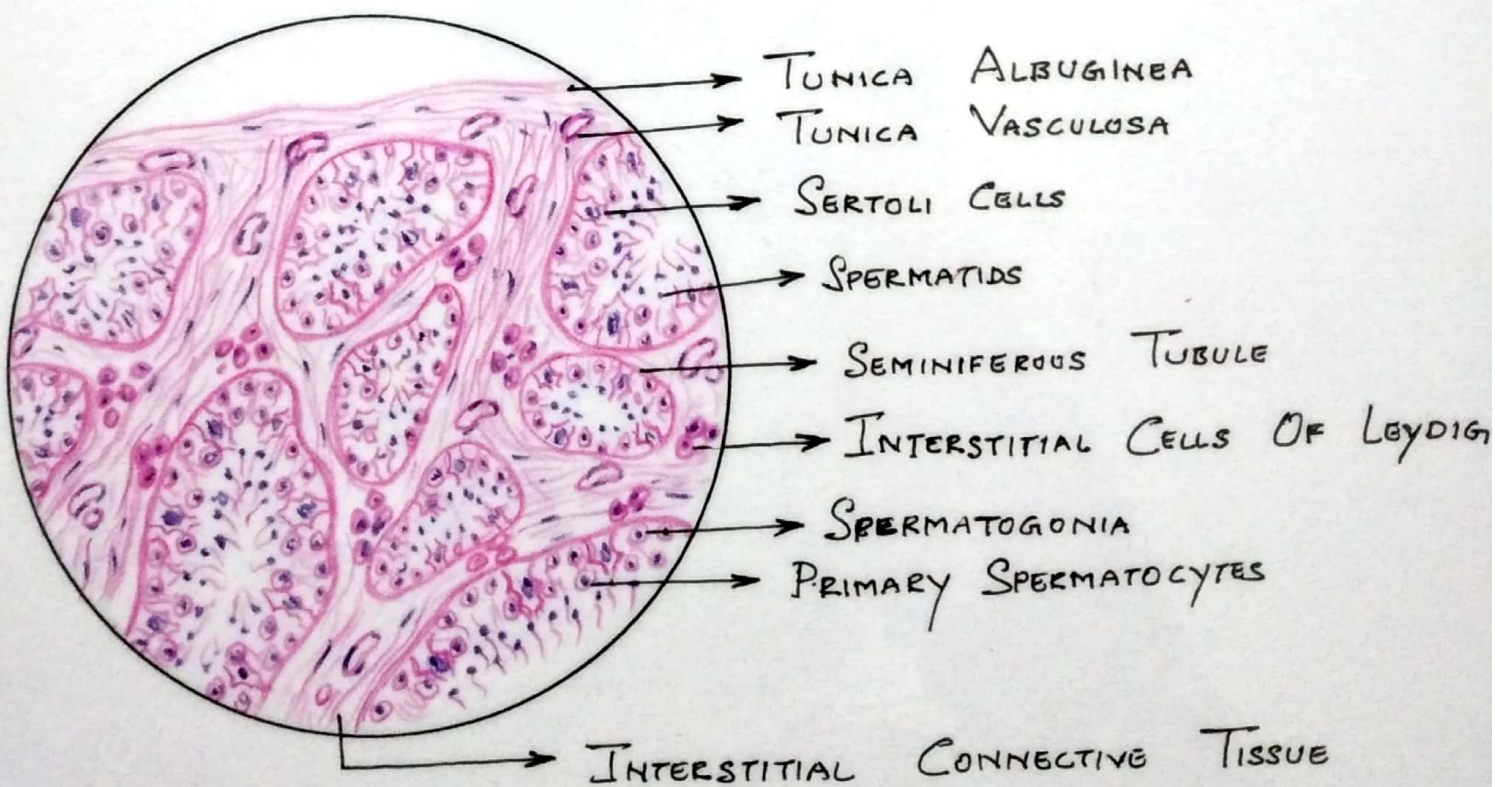
- Presence of osteons or Haversian systems
- Each osteon consists of layers of concentric lamellae arranged around a central (Haversian) canal
- Circumferential, interstitial and concentric lamellae seen.

MALE REPRODUCTIVE SYSTEM: PROSTATE



- Prostatic acini lined by Simple Columnar epithelium
- Fibromuscular stroma surrounding the prostatic glands
- Prostatic concretions (corpora amylacea) seen in the prostatic acini

MALE REPRODUCTIVE SYSTEM: TESTIS



- Tunica albuginea and tunica vasculosa seen
- Numerous seminiferous tubules lined with stratified epithelium called germinal epithelium
- The germinal epithelium contains spermatogenic cells and sertoli cells
- Interstitial cells of Leydig are present

RETICULAR TISSUE



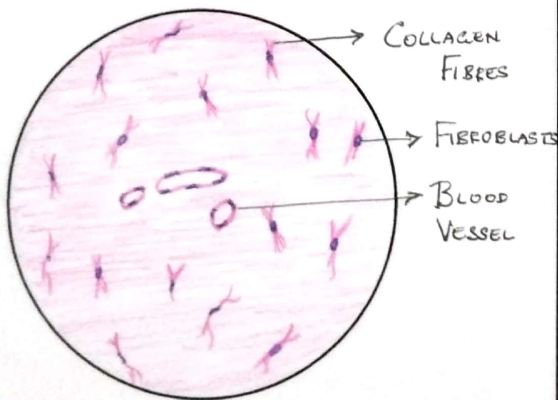
Loose connective tissue made up of reticular fibres and reticular cells

FUNCTIONS:

1. Form supporting networks for the cells
2. Reticular network is closely associated with reticular cells

Lymph nodes, glands, Bone marrow, spleen, lymph nodes

MUCOID TISSUE



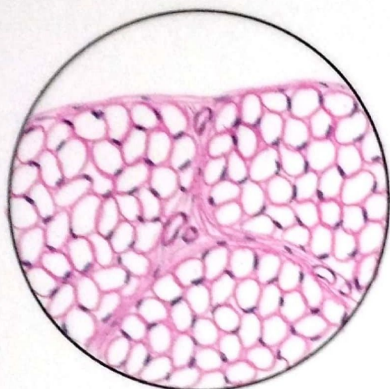
1. Embryonic connective tissue
2. Ground substance is abundant, fibres & cells are less.
3. Has jelly like ground substance rich in hyaluronic acid
4. Star shaped fibroblasts, some delicate collagen fibres and some rounded cells are scattered in the ground substance.
5. Cells present branching processes

FUNCTIONS:

1. Supportive

Umbilical cord, vitreous of the eyeball, pulp of the developing teeth

ADIPOSE TISSUE



1. Oval/rounded adipocytes occurring singly and polygonal in colonies
2. Peripheral scanty nucleus
3. Prominent eccentric nucleus
4. Adipocytes are grouped together to form lobules & are supported by reticular fibers.

FUNCTIONS:

1. Storehouse of nutrition
2. Acts as insulator
3. Acts as shock absorber
4. Gives cushioning effect

Below the skin in superficial fascia as panniculus adiposus, axilla, breast, buttocks, thigh, palm, foot, around the stomach, kidney, heart & intestine

ELASTIC TISSUE



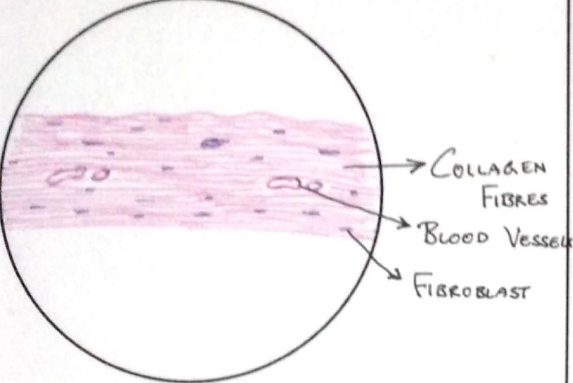
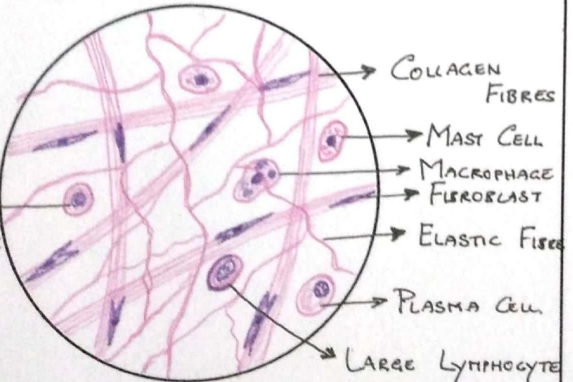
1. Specialized dense connective tissue formed by elastic fibres.
2. Yellow in color

FUNCTIONS:

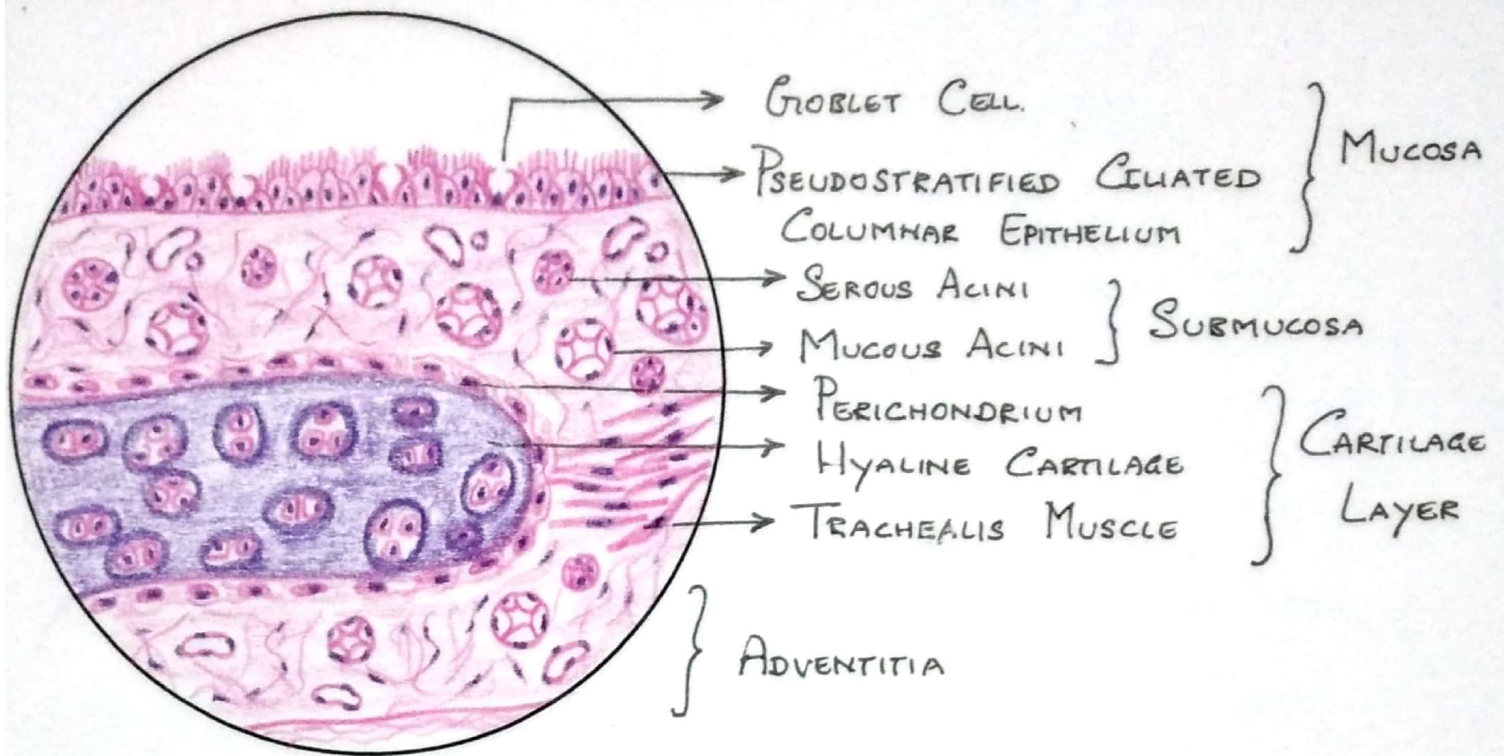
1. Elastic fibres are numerous in membranes that are required to stretch periodically. Ex: deeper layer of superficial fascia covering the anterior abdominal wall has high proportion of elastic fibres to allow distention of abdomen
2. Elastic fibres may fuse with each other to form sheets which form the main support for the walls of large arteries Ex: Aorta
3. In smaller arteries they form internal elastic lamina

Ligamentum nuchae, ligamentum flava, vocal ligaments of larynx, vocal folds and crico-vocal membrane, mucous membrane of trachea, bronchi and lung alveoli, coats of large blood vessels

STUDY OF CONNECTIVE TISSUE

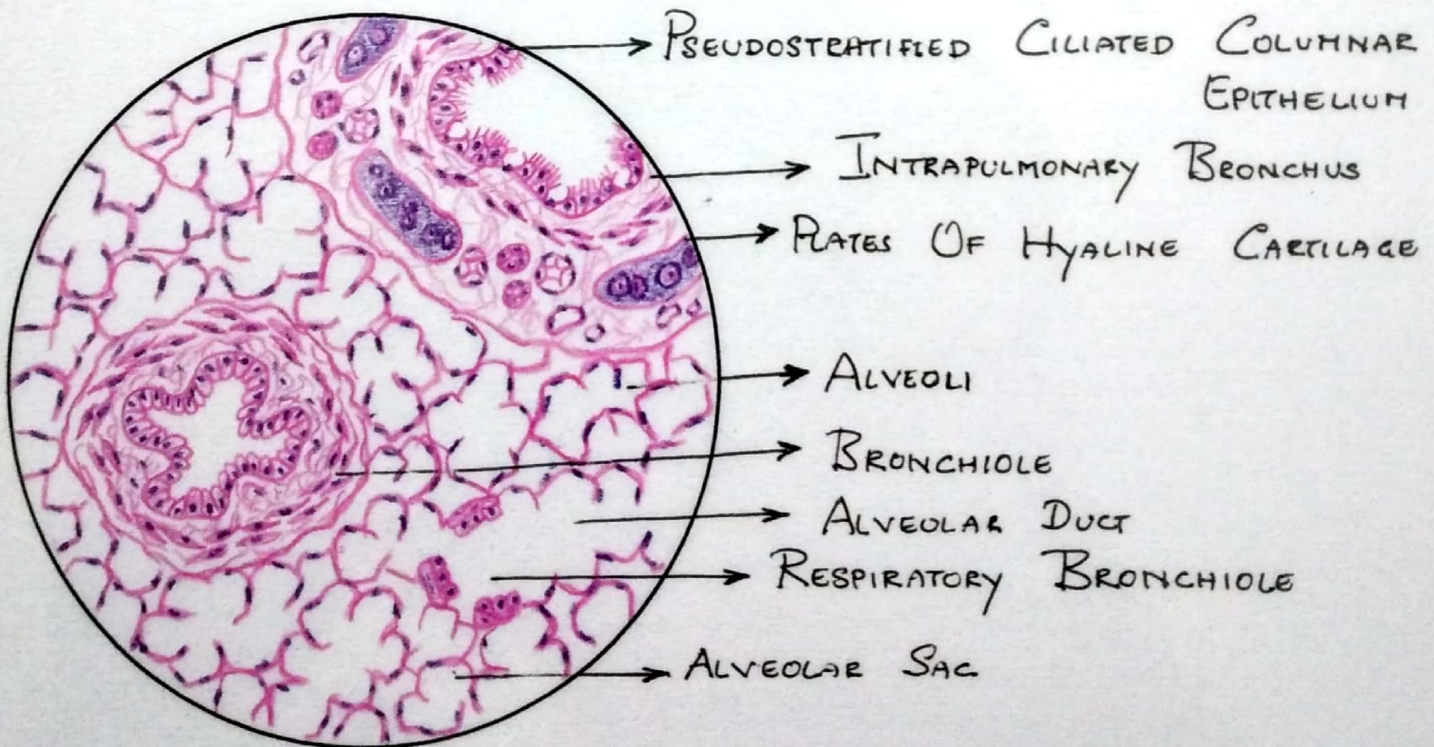
TYPE OF CONNECTIVE TISSUE	FEATURES	OCCURRENCE
DENSE CONNECTIVE TISSUE  Labels: COLLAGEN FIBRES, BLOOD VESSEL, FIBROBLAST	DENSE IRREGULAR Rich in densely packed fibres with very few number of cells & ground substance 1. Rich in collagen fibres 2. Fibers are arranged randomly in an irregular fashion along with few fibroblasts DENSE REGULAR 1. Rich in collagen fibres 2. Fibers are arranged regularly in parallel lines along with few fibroblasts FUNCTIONS: 1. Supportive 2. Defense mechanism 3. Repair of tissue	DENSE IRREGULAR Dermis of the skin, capsule of different organs like spleen, liver, kidney, thymus, tunica adventitia of blood vessels and periosteum of bone, connective tissue sheaths of muscles & nerves, sclera. DENSE REGULAR Tendon & ligaments, sheets of deep fascia, intermuscular septa, aponeuroses, the central tendon of diaphragm, fibrous pericardium & duramater
LOOSE AREOLAR CONNECTIVE TISSUE  Labels: COLLAGEN FIBRES, MAST CELL, MACROPHAGE, FIBROBLAST, ELASTIC FIBRES, PLASMA CELL, LARGE LYMPHOCYTE, SMALL LYMPHOCYTE	1. Rich in cells with abundant matrix 2. Loose and irregular arrangement of connective tissue fibers 3. Few air spaces seen in the extracellular matrix FUNCTIONS: 1. Helps in wound healing 2. Supportive 3. Fills the gap in between the cells of various tissue & gives a shape to the organ	Endomysium, subperiosteal tissue, lamina propria

RESPIRATORY SYSTEM: TRACHEA



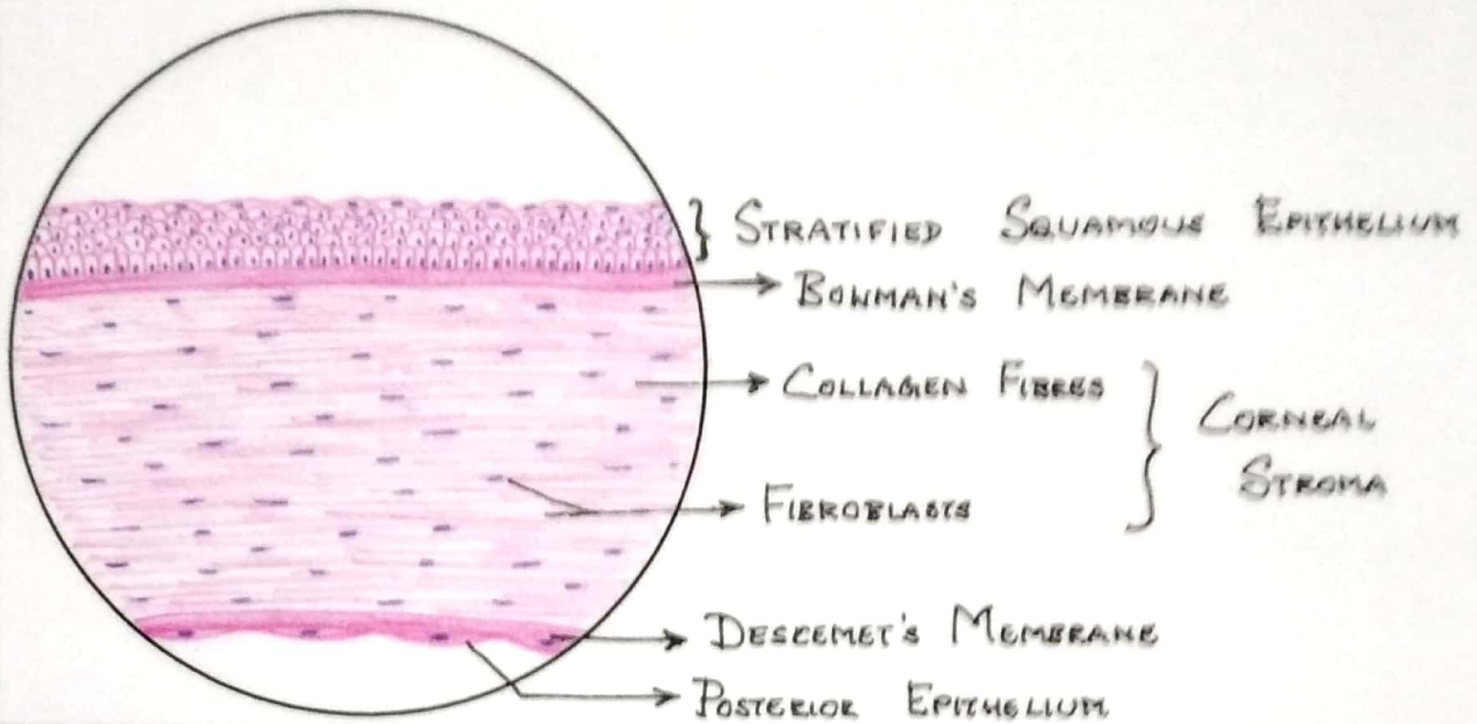
- Mucosa lined by pseudostratified ciliated columnar epithelium with goblet cells.
- Submucosa contains serous and mucous glands
- Hyaline cartilaginous ring present

RESPIRATORY SYSTEM: LUNG



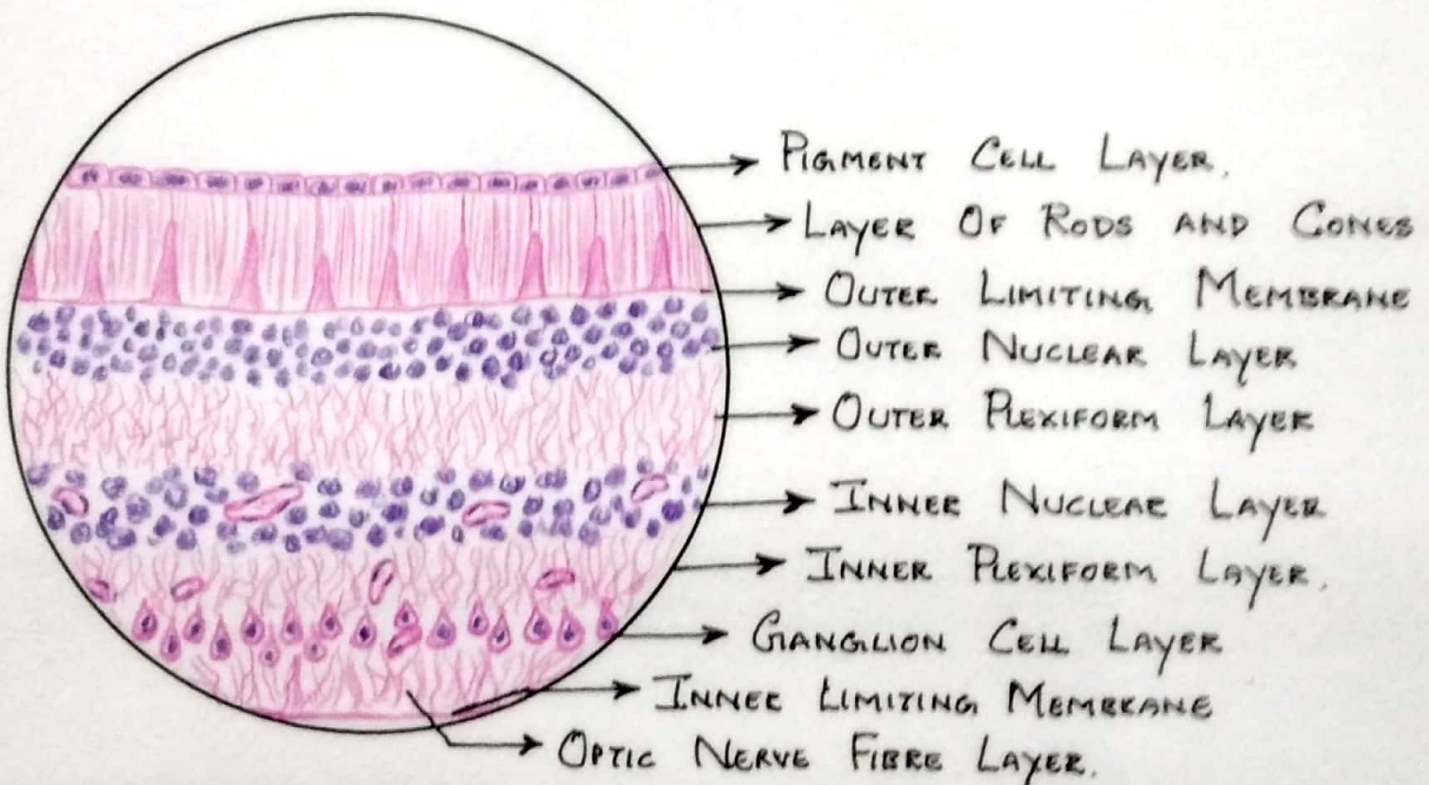
- Honey comb appearance of alveoli
- Pulmonary alveoli lined by simple squamous epithelium
- Intrapulmonary bronchi, terminal and respiratory bronchioles seen

SPECIAL SENSES: CORNEA



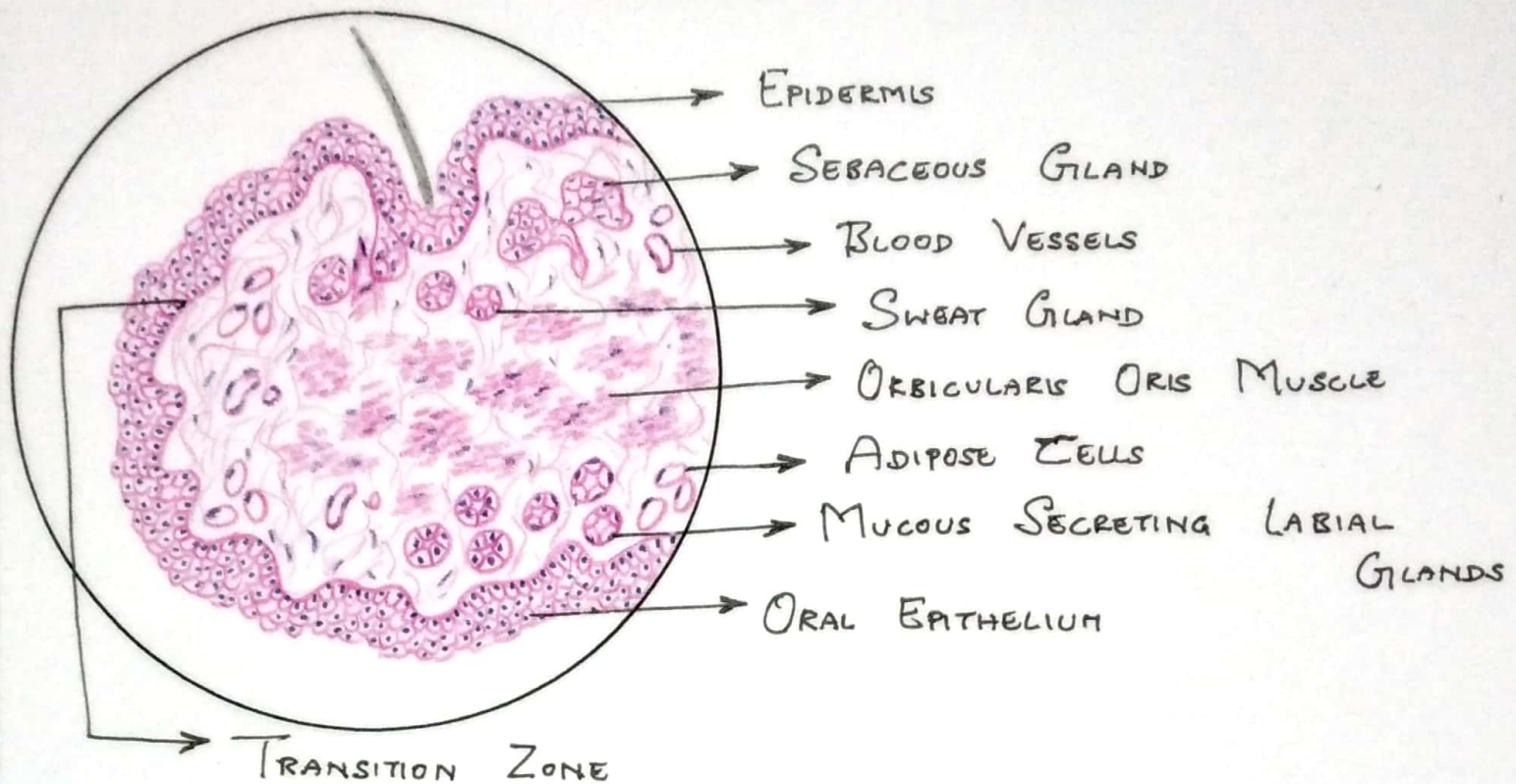
- Anterior surface is covered with stratified squamous non-keratinized epithelium.
- Corneal stroma consists of collagen fibres and fibroblasts.
- Posterior surface is covered with simple squamous epithelium.

SPECIAL SENSES: RETINA



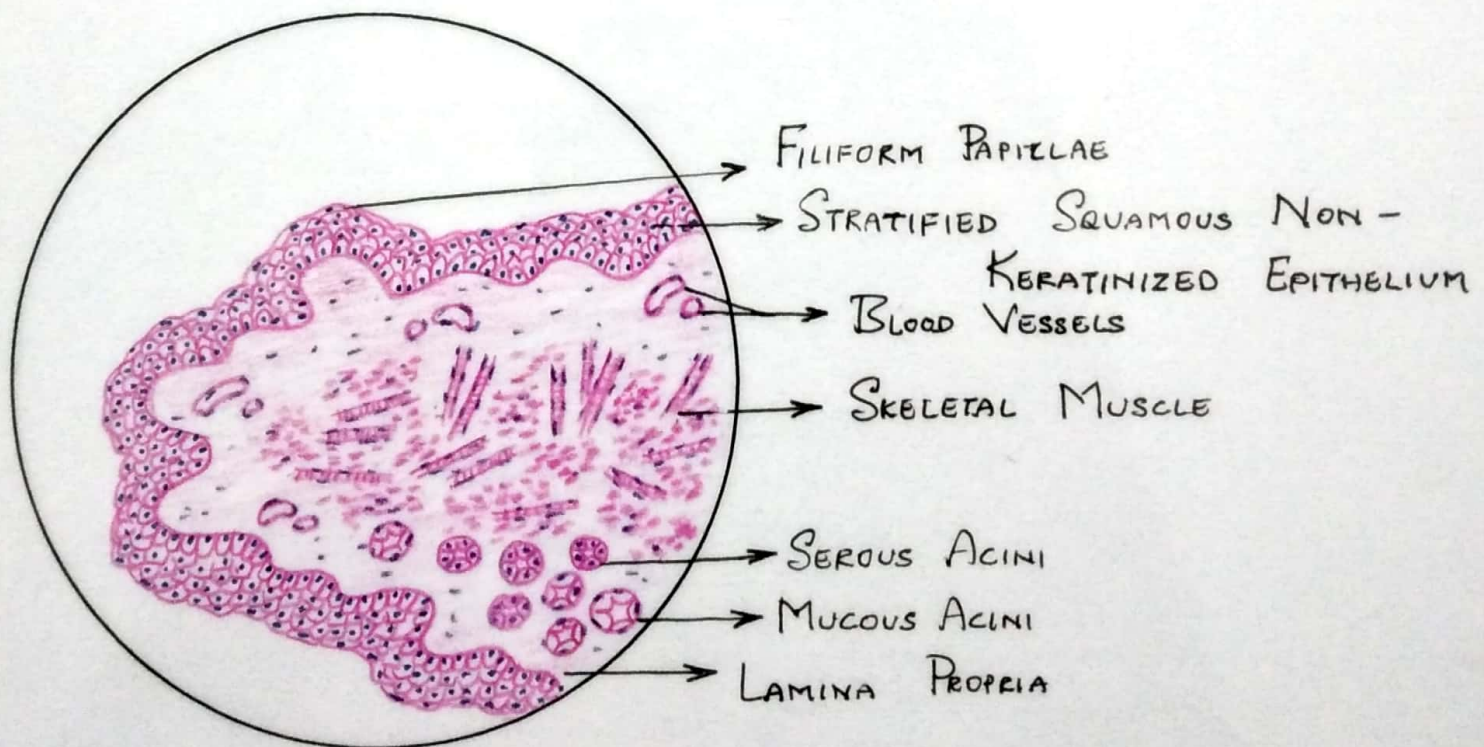
- Outermost layer contains cuboidal pigment epithelial cells.
- Layer of rods & cones formed by the peripheral processes.
- Outer limiting membrane formed by the processes of supporting neuroglial Muller cells.
- Outer nuclear layer contains nuclei of rods and cones.
- Outer plexiform plexiform consists of axons of rods & cones that synapse with dendrites of bipolar & horizontal cells.

ORAL CAVITY: LIP



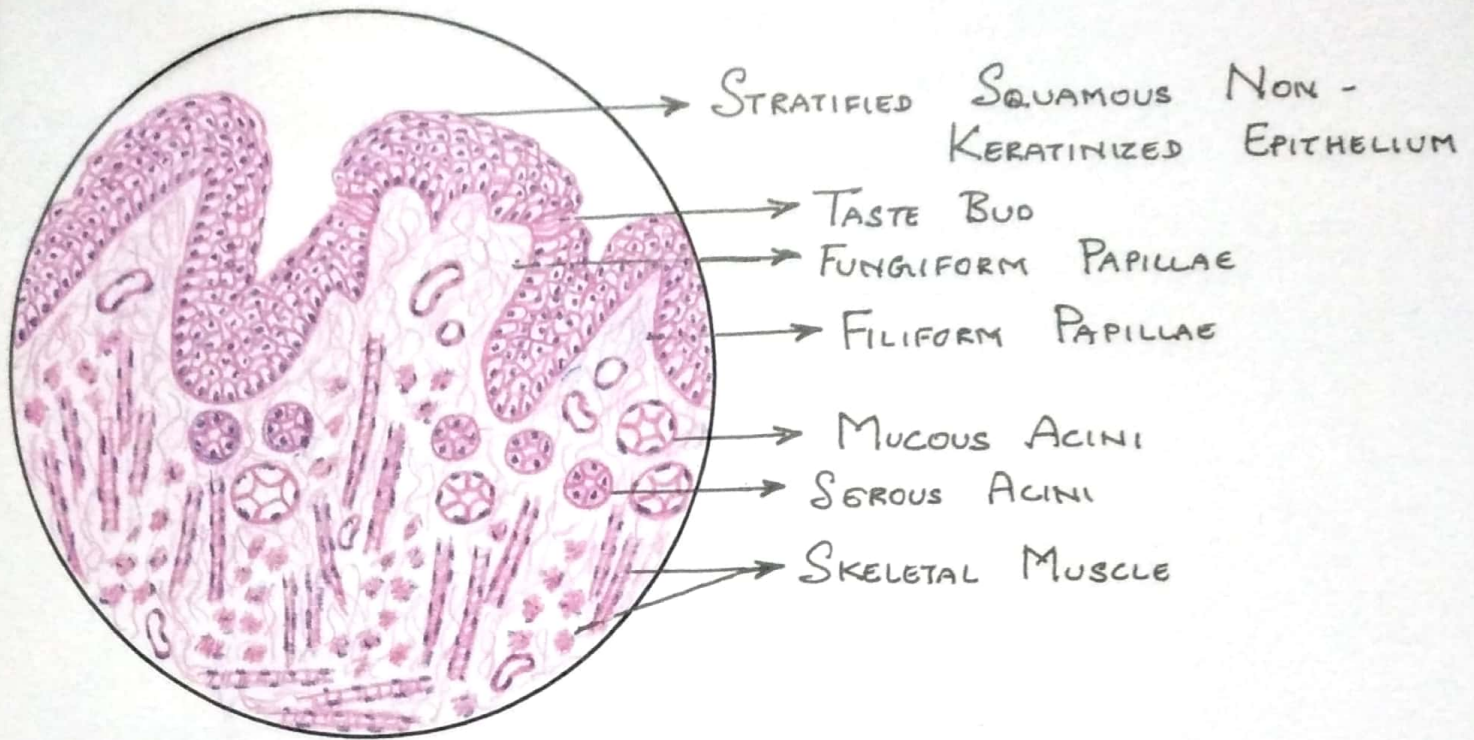
- Outer surface lined by stratified squamous keratinized epithelium.
- Inner surface lined by stratified squamous non-keratinized epithelium
- Mucous glands & skeletal muscle present

ORAL CAVITY: TONGUE



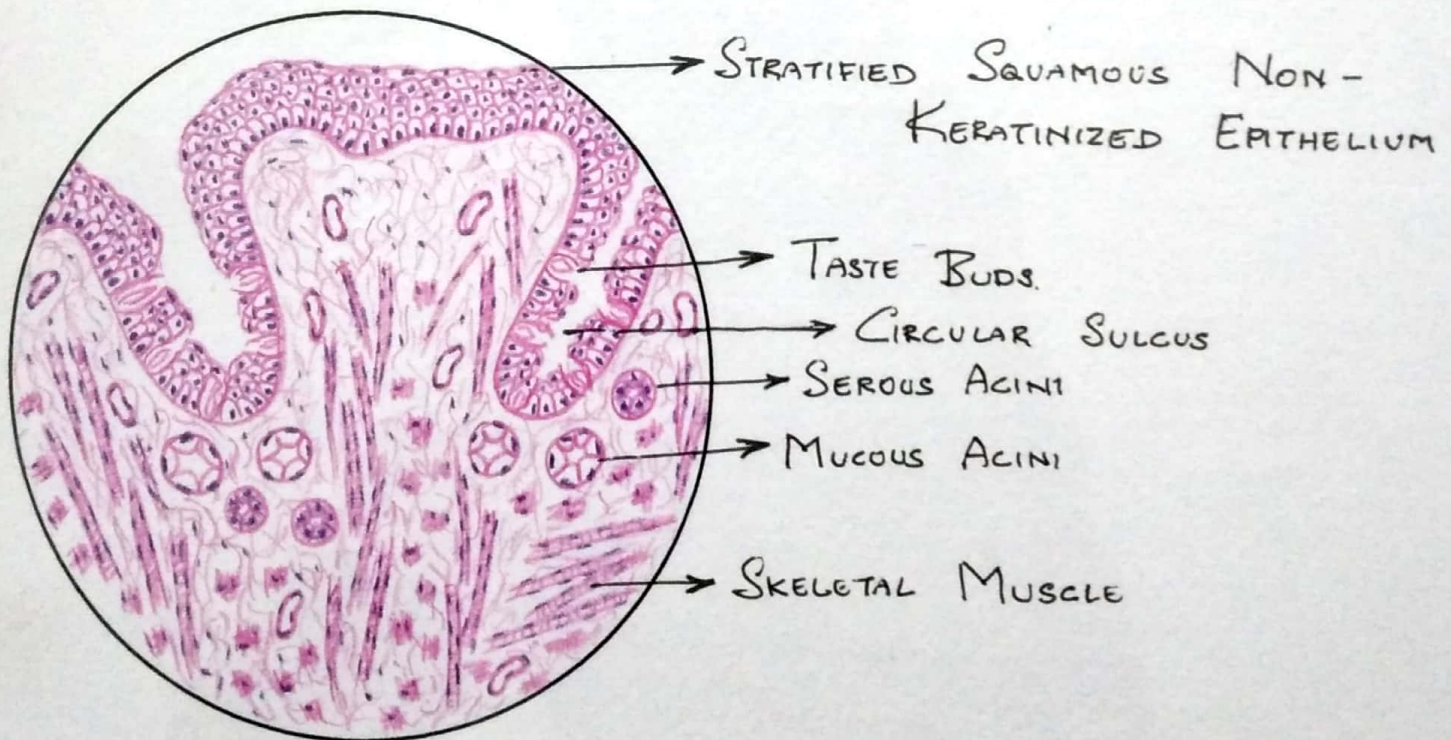
- Lined by stratified squamous non-keratinized epithelium
- Filiform, fungiform & circumvallate papillae seen
- Transverse and longitudinal arrangement of skeletal muscle seen

ORAL CAVITY: FILIFORM & FUNGIFORM PAPILLAE



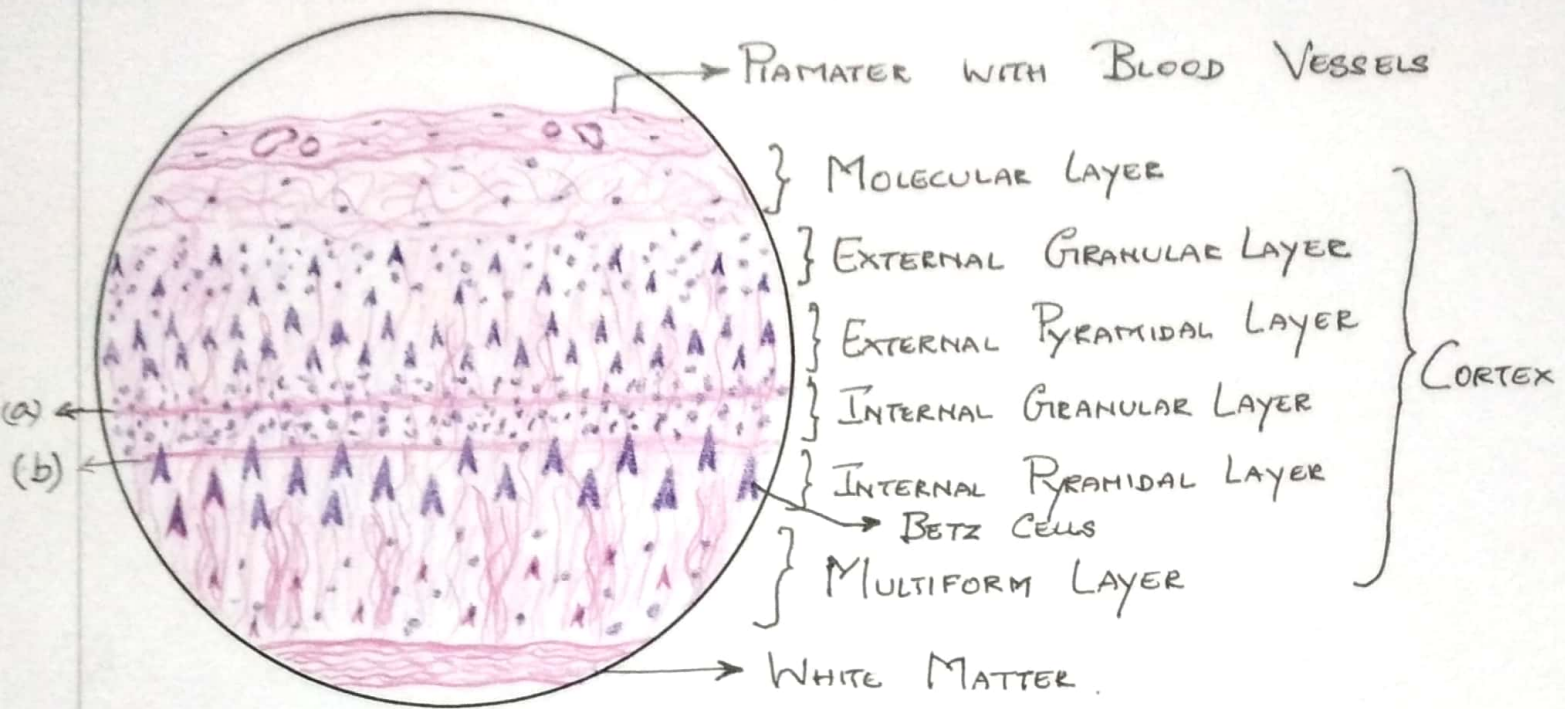
- Narrow, conical Filiform papillae lined by stratified squamous non-keratinized epithelium.
- No taste buds seen in filiform papillae.
- Mushroom-like Fungiform papillae lined by stratified squamous keratinized epithelium.
- Taste buds are present on the apical surface of fungiform papillae.

ORAL CAVITY: CIRCUMVALLATE PAPILLAE



- Lined by stratified squamous non-keratinized epithelium
- Furrows present which surround the base of each papilla
- Taste buds are present on the lateral surface of the papillae
- Numerous tubuloacinar serous (von Ebner) glands seen

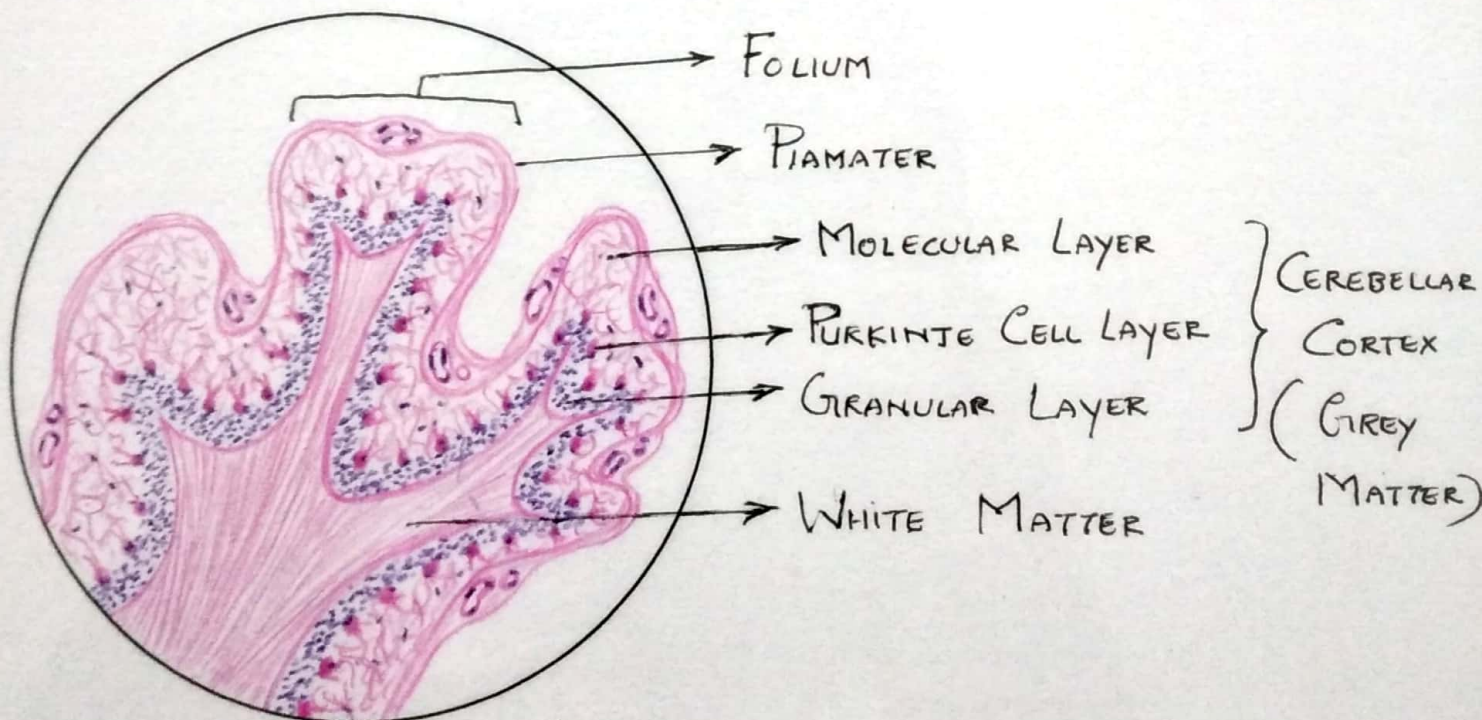
NERVOUS SYSTEM: CEREBRUM



- Piamater covering the outer molecular layer.
- Six layers of cells seen in the cerebral cortex.
- Inner & outer bands of Baillarger seen.
- Bundles of axons in the white matter.

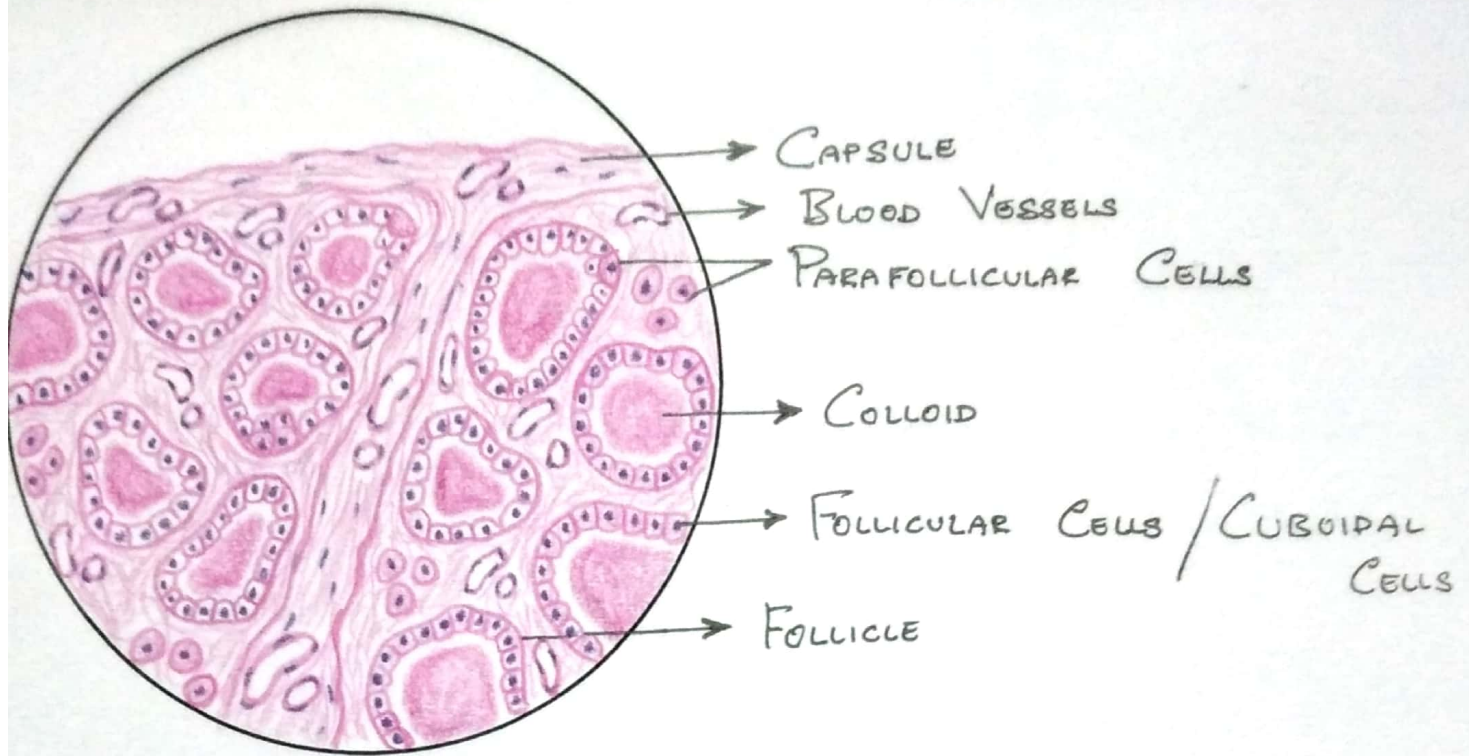
(a) OUTER BAND OF BAILLARGER
(b) INNER BAND OF BAILLARGER

NERVOUS SYSTEM: CEREBELLUM



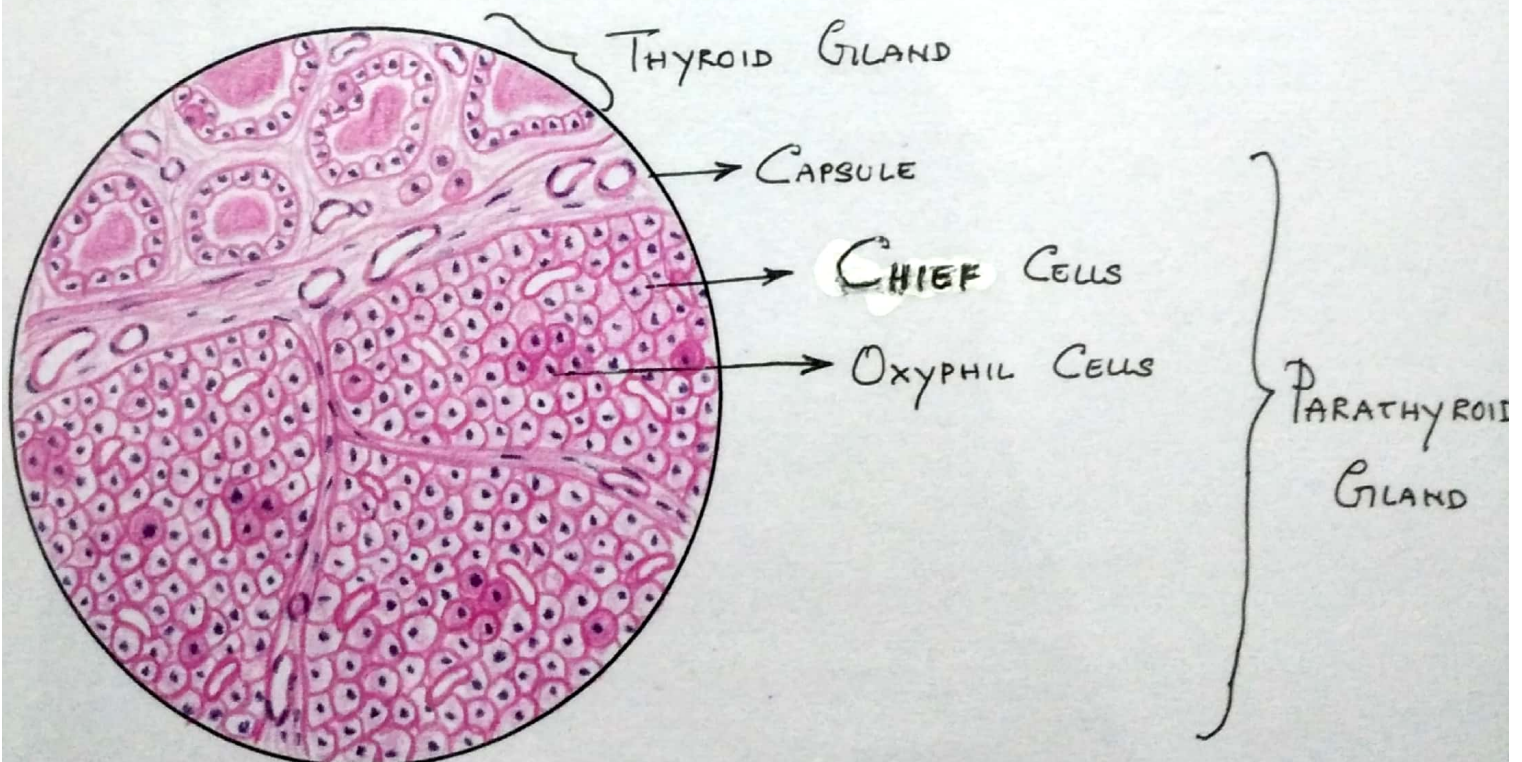
- Cerebellar folia covered by piamater separated by sulci.
- Outer grey matter or cortex and inner white matter.
- Cerebellar cortex consists of 3 layers, outer molecular, middle Purkinje and inner granular layer.
- White matter forms the core of each folium & consists of myelinated nerve fibres.

ENDOCRINE SYSTEM: THYROID GLAND



- Characterized by numerous and variable sized follicles filled with acidophilic secretory product called colloid.
- Follicles lined by simple cuboidal epithelium consisting of follicular (principal) cells.
- Parafollicular cells seen as single cells or in clumps on the periphery of the follicles.

ENDOCRINE SYSTEM: PARATHYROID GLAND



- Cells are arranged into anastomosing cords and clumps.
- Consists of chief (principal) cells and oxyphil cells.