ANIMAL ORGANIZATION

VSAQ

1. How are cnidarians more advanced than sponges?

Cnidarian show tissue grade organization with nerve cells and sensory cells
Sponges show cellular grade of organization without nerve cells and sensory cells.

2. **Name the three primary germ layers of a triploblastic animal. Mention the subkingdom and grade to which they belong in the system of classification.**

Ectoderm, endoderm and mesoderm are the three primary germ layers in triploblastic animal.
They belong to subkingdom 'EUMETAZOA', and grade 'BILATERIA'.

3. Which symmetry is known as homaxial apolar symmetry? Give an example.

Spherical symmetry is considered as homaxial apolar symmetry.
It is a rare symmetry. It is present in Heliozoans and Radiolarians.

4. Which symmetry is known as monaxial heteropolar symmetry? Give an example.

Radial symmetry is known as Monaxial heteropolar symmetry.
It is present in Hydra and Jelly fish.

5. Give two examples of biradial symmetry.

Ctenophors and most anthozoans like sea anemones show biradial symmetry.

6. With which symmetry is cephalization is associated? Name the plane of symmetry that type of symmetry.

Cephalization is associated with bilateral symmetry.
The only one plane of symmetry known as median sagittal plane is present.

7. Distinguish between blastocoel and archenteron.

Blastocoel is the central cavity of blastula. It is also known as segmentation cavity or the primary body cavity. It is a closed cavity without any opening to outside.
Archenteron or primitive gut is the open cavity of gastrula. It opens out by Blastopore.

8. Distinguish between blastocoel and blastopore.?

Blastocoel is the central cavity of blastula. It is also known as segmentation cavity or the primary body cavity. It is a closed cavity without any opening to outside.
Blastopore is the opening of archenteron or primary body cavity.

9. What is pseudocoelomate condition? Name the major pseudocoelomate phylum.

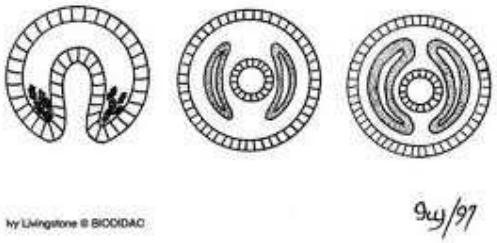
Pseudocoelom is neither formed in the mesoderm nor is lined by mesodermal peritoneum.
Pseudo coelom represents persistent blastocoels.
Nematoda is the phylum with pseudocoelom.

10. How does coelom differ from pseudocoelom?

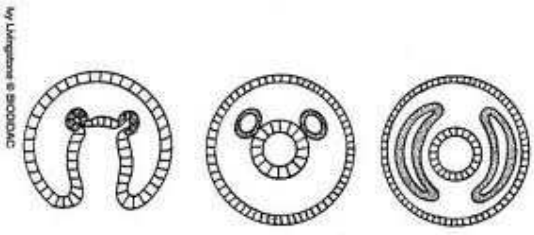
Coelom is lined by mesodermal peritoneum. It secondary body cavity.
Pseudocoelom is a false body cavity which is not lined by peritoneal layers. It represents persistent blastocoels.

11. What are retroperitoneal organs?
The organs which lie outside the coelom and are covered by peritonaeum only on the surface facing the coelom are known as retroperitoneal organs.
E.g., Kidneys which present between body wall and somatic peritoneum.

12. What is Schizocoelom ? Which phylum has schizocoelom as principal body cavity in adults?
Schizocoelom is a split cavity formed by the splitting of mesodermal band.
Annelida is the phylum with schizocoelom as principal body cavity.



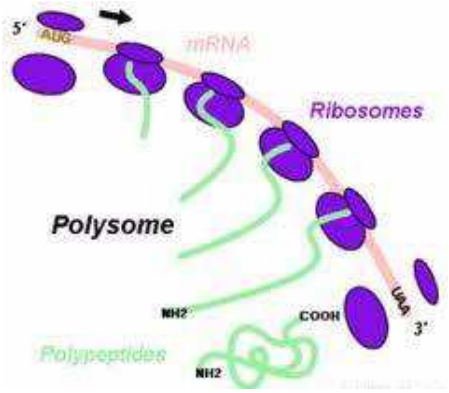
SCHIZOCOELOM



ENTEROCOELOM

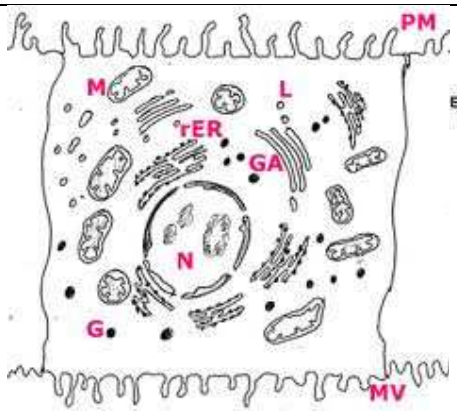
13**. What is enterocoelom? Which phyla have it?**
Enterocoelom mesodermal pouches evaginate from the wall of archenteron. These pouches are separated from archenteron and obtain a cavity in them which is known as enterocoelom.
Echindoermata, Chordata are the phyla with enterocoelom.

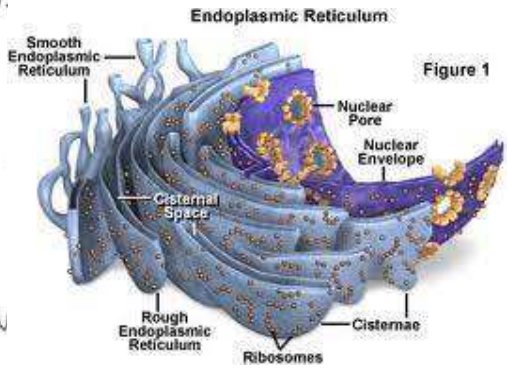
14**. What are polyribosomes ?**
The clusters of ribosomes connected by a strand of mRNA are polysomes.



15. Mention two differences between rough ER and smooth Er.?

ROUGH ER	SMOOTH ER
1.Ribosomes attach with ER 2.It is the site for protein synthesis	Without ribosomes It is site for lipid production and Detoxification of drugs.

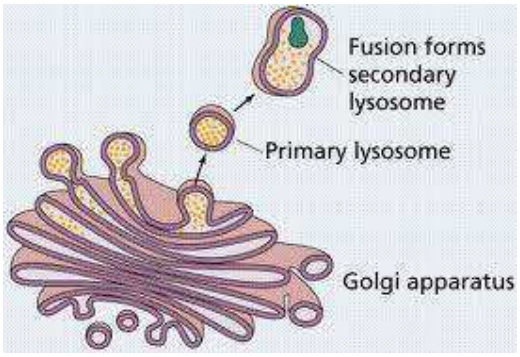




16. Which organelles are called 'suicidal bags'? Why? (March 2011)

Lysosomes are called as 'suicidal bags'.

Lysosomes have role in autolysis of injured diseased cells.



17. What are the functions of Golgi apparatus?

Golgi apparatus are most abundant in secretory cells like pancreatic cells.

In Golgi apparatus, the proteins formed from ER are concentrated, modified and are packaged into secretory vesicles.

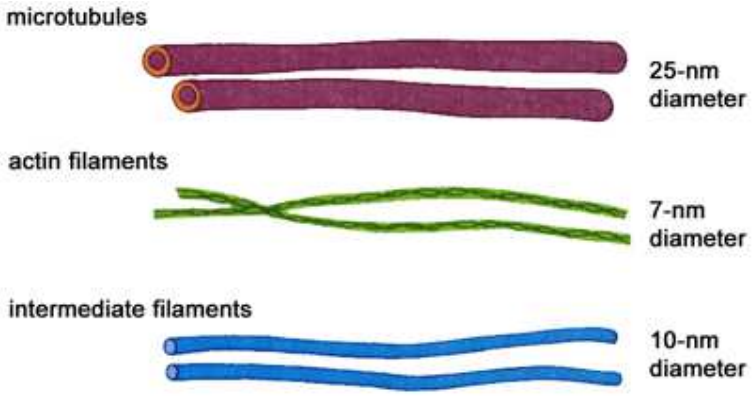
18**. Name the three types of protein elements of cytoskeleton of a generalized animal cell.**

Three types of protein elements are

A) Microtubules – Hollow, slender and are made with Globulin

B) Intermediate filaments – made with various types of proteins.

C) Microfilaments – Solid strings of Actin molecules.



19. What do you know about microtubule – organizing centre?

Centrosome is a microtubule-organizing centre (MTOC) and has a pair of centrioles that present right angles to each other.

Centrioles are duplicated before cell division and involve in chromosome movement.

20. In an animal cell, where do transcription and translation respectively take place?

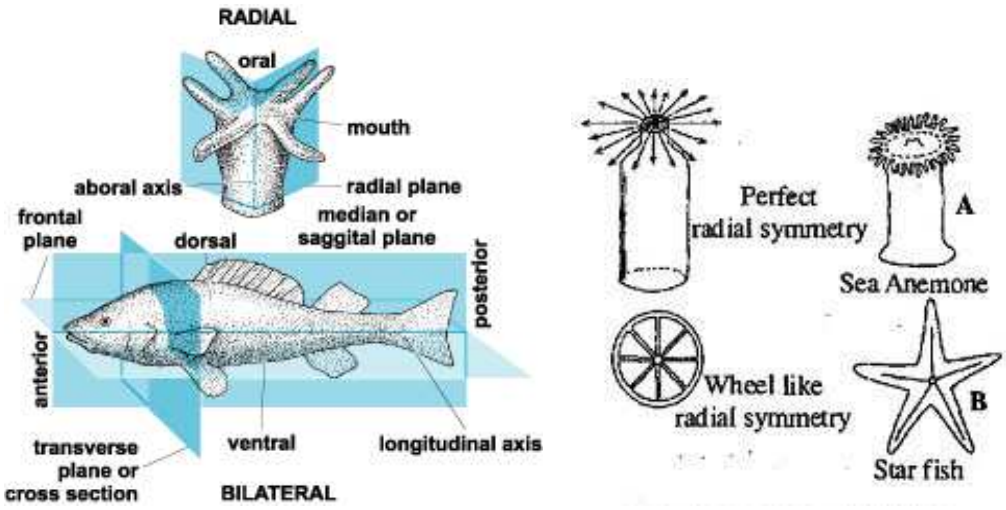
Transcription occurs in Nucleus.

Translation occurs in cytoplasm.

SAQ

1. Compare various types of Symmetry.

Type of Symmetry	**Shown by**	**Chances of getting antimeres**		**Special feature**
		Axis	Plane	
1.Spherical	Radiolarians Heliozoans	Any	Any	Homaxial apolar. Rare . Floating animals
2.Radial	Hydrozoans Scyphozoans	Only one axis Antero-posterior Longitudinal	Any	Monaxial heteropolar
3. Biradial	Anthozoans Ctenophors	Only one axis	Two planes Passing through mouth	Elongated, Oval mouth
4.Bilateral	Triploblastic animals	Only one Antero-posterior	One. Median Sagittal plane	Cephalization is present Advanced animals Show quick movements



2. Explain bilateral symmetry. Write the advantages of bilateral symmetry.

- Bilateral symmetry was a major advancement in animal evolution.
- Principal axis is anterior-posterior axis. It is heteropolar.
- Sagittal axis is alos heteropolar and dorsal and ventral surfaces are well differentiated.
- There is only one plane of symmetry i.e., Median sagittal plane through which right and left halves are formed.
- In these animals, cephalization is well developed with concentration of sense organs and nervous tissue in the anterior end.
- These animals can sense the new environment more efficiently than other animals.

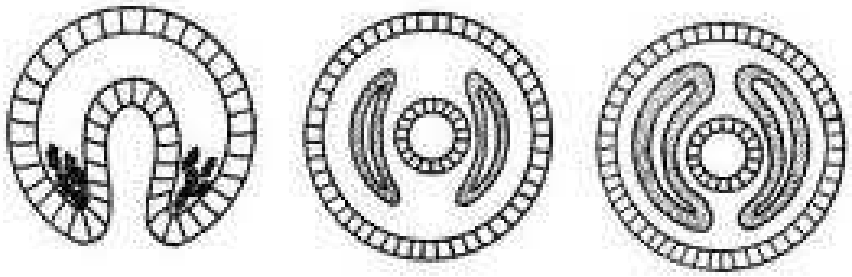
3. Advantages of coelom over other animals?

- Viscera of coelomates have muscular walls and are separated from the body wall by fluid-filled coelom. So they can contract and relax more freely within the coelom.
- Alimentary canal can churn and propel food along its length by contractions relaxations which are independent of the body wall.
- Gametes are released into coelomic fluid in some invertebrates and in female vertebrates.
- Coelomic fluid receives excretory products,.
- It allows contact between mesoderm and endoderm which leads to Primary induction.
- Primary induction is kind of interaction between tissues of different origin involved in the development of specialized tissues.

4. Explain the formation of Schizocoelom.

- A single micromere known as 4d blastomere or mesentoblast cell present at the rim of blastopore proliferates to from mesoderm between the developing archenteron (endoderm) and the body wall (ectoderm) in the blastocoels.
- A series of paried blocks of mesoderm develops.
- A split appears within each block making them hollow.
- The cavity formed by the splitting of mesodermal band is the schizoceolm.
- Blastocoel is replaced by schizocoelm.
- Annelids,Arthropods and mollusks are schizocoelmates.

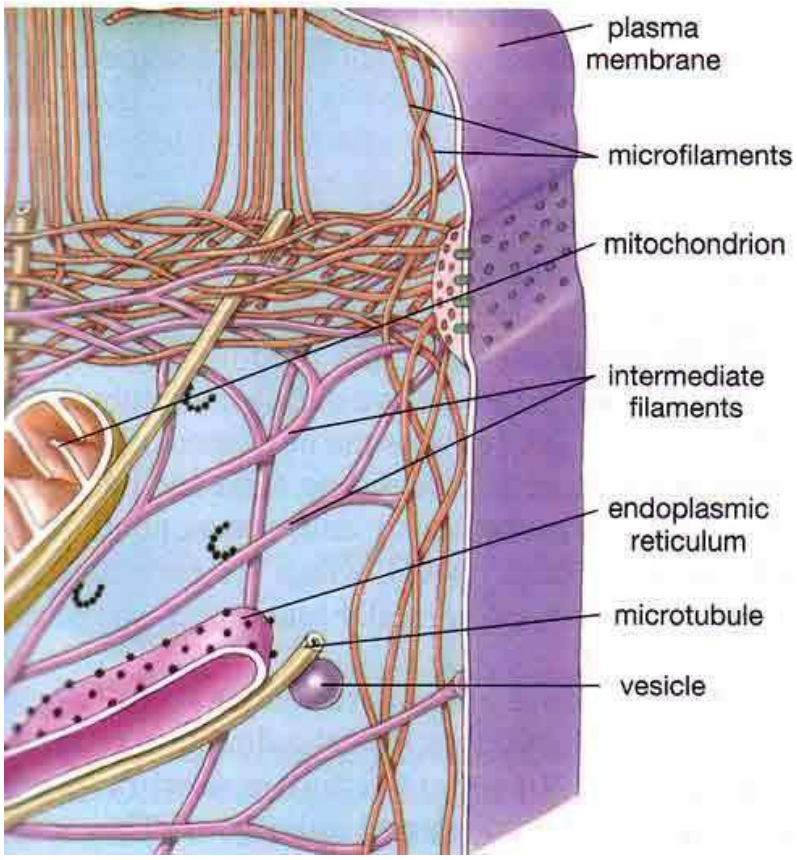
- Schizocoelmates are protostomes as the blastopore develops from mouth.
- In arthropods and mollusks, schizocoelom is reduced and the principal body cavity is
- Haemocoel.



5. Explain the cytoskeleton of cell?

- Cytoskeleton is a flexible cellular framework extends throughout the cytoplasm.
- It consists of three types of protein elements.

Part of cytoskeleton	**Nature**	**Protein**	**Role**
1.Microtubules	Hollow,slender	Tubulin	Movement of organelles like secretory vesicles. Chromosome movement.
2.Intermediate Filaments		Various types	Maintain the position of Organelles. Promote mechanical activities
3.Microfilaments	Solid strings	Actin	Muscle contraction. Provide mechanical support for cellular structures for Cellular movements


plasma membrane
microfilaments
mitochondrion
intermediate filaments
endoplasmic reticulum
microtubule
vesicle

ANIMAL TISSUES

V S A Q:

1. What is stratified squamous keratinized epithelium? Write its significance.

It covers dry surfaces like skin. It covers dry surfaces like skin. The cells of apical Stratum corneum are dehydrated and contain keratin.

It protects the underlying tissues from microbes, heat and chemicals.

2. What is transitional epithelium? Write its significance.

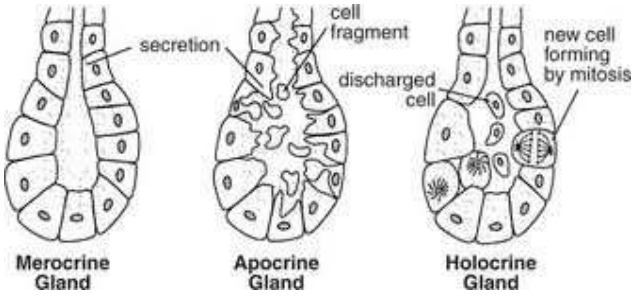
- The epitheilium in which number of layers of cells and shapes of cells not constant and always changeable based on condition of organs of its location is transitional epithelium.
- It is specialized to withstand a greater degree of stretch.
- It is present in walls of urinary bladder, ureters and parts of urethra.

3. What is pseudostratified columnar epithelium? Give an example.

- All cells are attached to basal lamina, but some do not reach the surface.
- It gives a false impression like a stratified type.
- It is of two types like a)Pseudostratified Ciliated Columnar -- in Trachea b)Pseudostratified Nonciliated Columnar – in Epididymis , Urethra

4. Distinguish between merocrine, holocrine and apocrine glands.

MEROCRINE GLANDS	HOLOCRINE GLANDS	APOCRINE GLANDS
1.Releases secretory granules by exocytosis without any loss of cell part e.g., PANCREAS	Entire cell disintegrates to secrete its substances SEBACEOUS GLANDS	Apical portion of cell in pinched off along with products. MAMMARY GLANDS



5. Describe mast cells of connective tissue?

- ❖ Mast cells produce heparin, histamine and bradykinin.
- ❖ Heparin acts as anticoagulant.
- ❖ Histamine and Bradykinin act as vasodilators to increase the vascular permeability.

6. Distinguish between white adipose tissue and brown adipose tissue?

WHITE ADIPOSE TISSUE	BROWN ADIPOSE TISSUE
1.Predominant in adults 2.cell has single large lipid droplet 3.Less blood supply	Predominant in foetus and infants Cell contains numerous lipid droplets Rich blood supply. More mitochondria Generates considerable heat in new born.

7. Distinguish between tendon and ligament.

- Tendon and ligaments are dense regular connective tissues.
- Tendon connects muscles to bones
- Ligaments connect bones to other bones.

8. Distinguish between appositional growth and interstitial growth in cartilage.

- Appositional growth occurs from differentiation of perichondrial cells.
- Interstitial growth occurs by the mitotic division and reactivation of preexisting chondrocytes.

9. Give two examples of Hyaline cartilage without perichondrium.

- Articular cartilage at the tips of bones
- Epiphyseal plates and costal cartilages are without perichondrium.

10. What are the characteristics of the tissue that occurs in intervertebral discs?

- Fibro cartilage is present at intervertebral discs.
- It is the strongest cartilage. Its matrix contains a dense network of coarse collagen
- Perichondrium is absent.

11. Distinguish between Osteoblasts and osteoclasts.?

- Osteoblasts synthesize the organic components of matrix of bone
- Ostoclasts help in resorption and remodeling of bone tissue.

12. Define osteon ?

- A haversian canal and the surrounding concentric lamellae and lacunae are collectively termed as osteon or Haversian system. It is the unit of bone.

13. What is Haematocrit ?

- The percentage of total blood volum occupied by RBCs is haematocrit.

14. What is eosinophilia ?

- Increase in number of acidophils or eosinophils in response to allergy are eosinophilia.

15. What is lymph? How it differ from plasma?

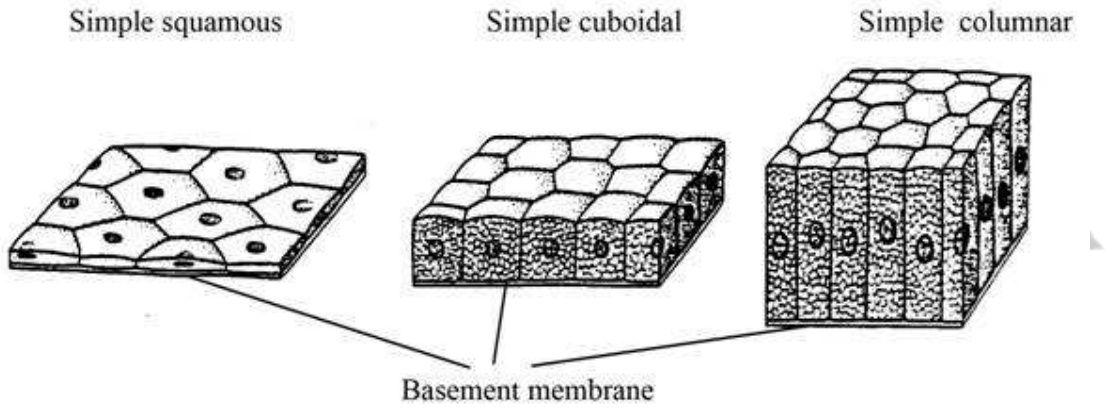
- The interstitial fluid that passes into the lymphatic vessel is llymph.
- Lymph is colorless fluid. It differs from plasma of blood by the absence of RBCs and less concentration of proteins.

S A Q ::

1. Write a short note on simple epithelia.

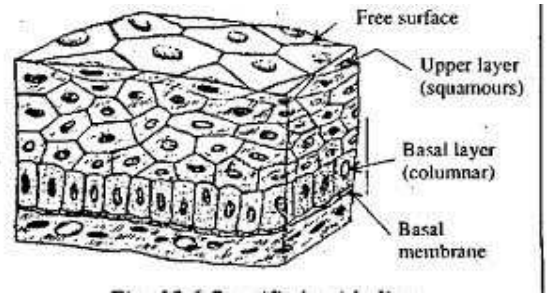
- Epithelial tissues may be derived from any of three primary germ layers.
- Simple epithelium consists of a single layer of cells. All the cells present on basal lamina.
- Simple epithelium is of several types based on shape of cells.

Type of epithelium	**Shape of cell**	**Shape & Position Of nucleus**	**Location**
1.Simple Squamous	Flat and tile like	Oval ; at centre	Endothelium of blood vessels & heart, Mesothelium of body Cavities , Bowman's capsule Alveoli of lungs
2. Simple Cuboidal	Cube shaped	Spherical, centre	Germinal epithelium of ovary, Lining of thyroid vesicles, Convoluted tubules of nephron
3. Simple Columnar	Pillar – like	Oval ; near the Base of cell	a)Ciliated --- Fallopian tube, Uterus, Cavities of spinal cord and brain b)Non-ciliated – Mucosa of gut



2. Write a short note on Stratified epithelia.

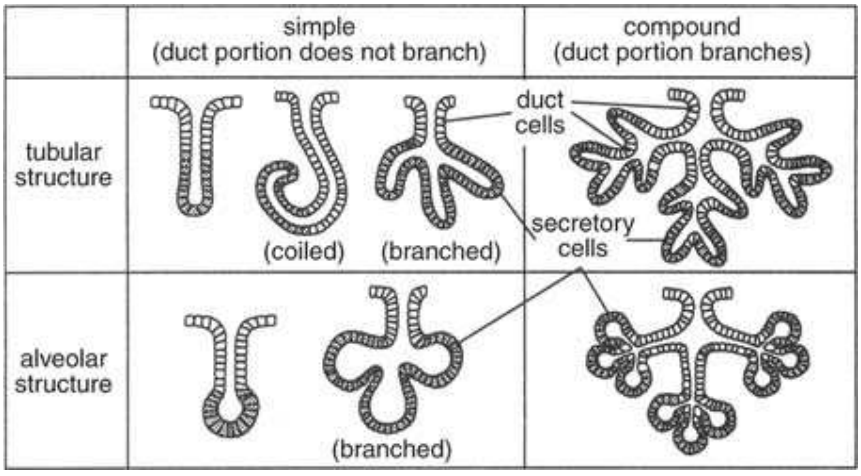
- Stratified epithelium consists of two or more layers of cells. It is of four types
  a) **Stratified Squamous epithelium** : Present in places of abrasion. It is of two types
     i) Stratified Squamous Keratinized epithelium: Covers dry surfaces like skin. Cells of apical layers are dehydrated with keratin.
     ii)Stratified Squamous Nonkeratinized Epithelium : Covers wet surfaces like oesophagus and vagina.
  b)**Stratified Cuboidal Epithelium** : Apical layer cells are cube-shaped. Rare type It is present in ducts of sweat glands.
  c) **Stratified Columnar epithelium**: It is also uncommon. Apical cells are columnar. It is present in conjunctiva of eye.



3. Describe about Glandular epithelia?

- ❖ Cells which are specialized for secretion form glandular epithelia.
- ❖ Unicellular glands have isolated glandular cells Eg.,Goblet cells of small intestine.
- ❖ Multicellular glands are composed of clusters of cells.
- ❖ Endocrine glands are ductless as they lose connection with surface.
- ❖ Exocrine glands retain their connection with the surface.
- ❖ Exocrine glands have secretory portion and ducts which transport the secretions.

A) Tubular glands – Secretory portion is tubular
B) Acinar / alveolar glands- Secretory portion is rounded.
C) Simple: Duct is unbranched
D) Compound: Duct is branched.
E) Simple Branched: Duct is unbranched but secretory portion is branched.



5. Describe about the cells of connective tissue.

Various types of cells present in connective tissue are

1) Fibroblasts --- Most common cells. They produce fibres.
2) Mast cells --- Produce heparin, histamine and bradykinin.
3) Macrophages --- Phagocytic cells. Monocytes of blood become macrophages in connective tissue. They are phagocytic. They are either tissue-fixed or wandering.
4) Plasma cells -- Large ovoid cells. Spherical and eccentric nucleus. They are derived from B lymphocytes and produce antibodies.
5)Adiposities --- Store fats or produce heat.

6) Leucocytes --- Migrate from blood vessels by diapedesis.

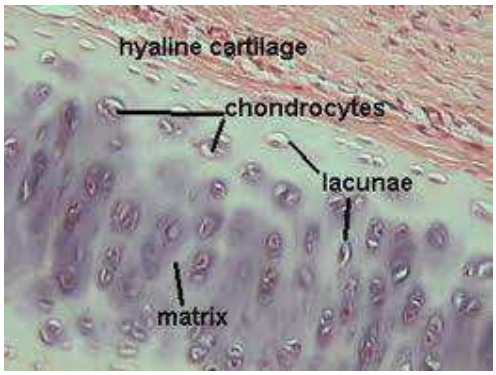
6. Describe about Adipose connective tissue.

- ❖ Adipose tissue is fat-storing tissue. It forms thermal insulation of body.
- ❖ It forms blubber below the skin in marine mammals like whales and sea cows.
- ❖ It acts as shock absorber in sols and palms.
- ❖ Subcutaneous adipose tissue provides body contour.
- ❖ It is present in yellow bone marrow. Adipocytes are more in this tissue.
- ❖ Adipose tissue is of two types

WHITE ADIPOSE TISSUE	BROWN ADIPOSE TISSUE
1.Predominant in adults 2.cell has single large lipid droplet 3.Less blood supply	Predominant in foetus and infants Cell contains numerous lipid droplets Rich blood supply. More mitochondria Generates considerable heat in new born.

7. Explain the structure of cartilage. Add a note on its growth.

- ❖ Cartilage or gristle can bear mechanical stresses without permanent distrortion.
- ❖ It forms the endoskeleton of cyclostomes and cartilaginous fishes and embryos of bony vertebrates.
- ❖ The matrix is pliable. It is surrounded by Perichondrium.
- ❖ It is avascular and gets nutrients from capillaries in perichondrium by diffusion.
- ❖ Lacunae are present in matrix. Each lacuna has one to eight chondrocytes.
- ❖ Chondroblasts secrete matrix and transform into inactive chondrocytes.
- ❖ Appositional growth occurs from differentiation of perichondrial cells.
- ❖ Interstitial growth occurs by the mitotic division and reactivation of preexisting chondrocytes.



8. Explain the three types of cartilages? (March '11)

- ❖ Three types of cartilages are ---Hyaline, Elastic and Fibrocartilages.

a) **HYALINE cartilage**: It is bluish-white and translucent. Delicate collagen fibrils are present. Perichondrium is present but it is absent in the areas where cartilage forms free surface or makes direct contact with bone.

-- It is the weakest cartilage.

-- **Location:** Walls nose, Larynx, Trachea, Bronchi, Costal cartilage (ventral of ribs), Epiphyseal plates , Articular cartilages in joints, Embryonic endoskeleton.

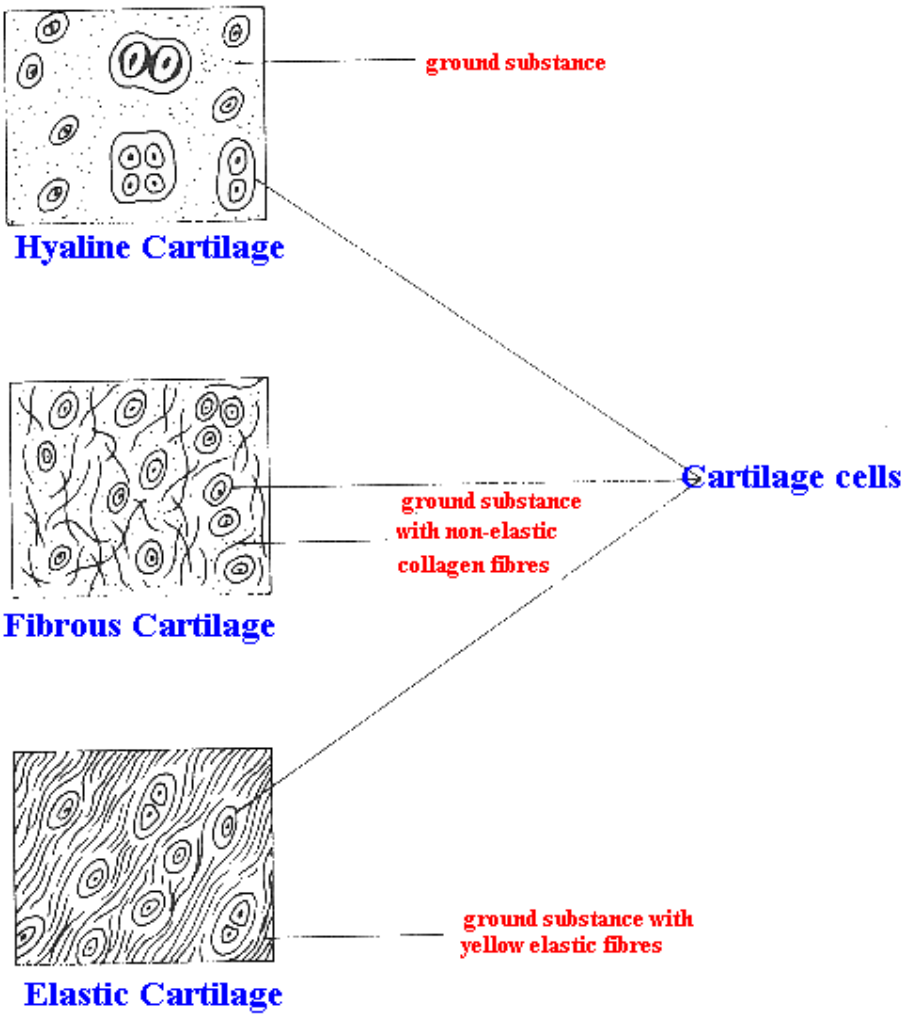
b) **ELASTIC cartilage**: More number of elastic fibres than collagen fibres.

It is yellowish. Perichondrium is present.

Location: Ear pinna, Eustachian tubes and Epiglottis.

c) FIBROCARTILAGE: It is strongest cartilage. Matrix has a dense network of collagen fibres. Perichondrium is absent.

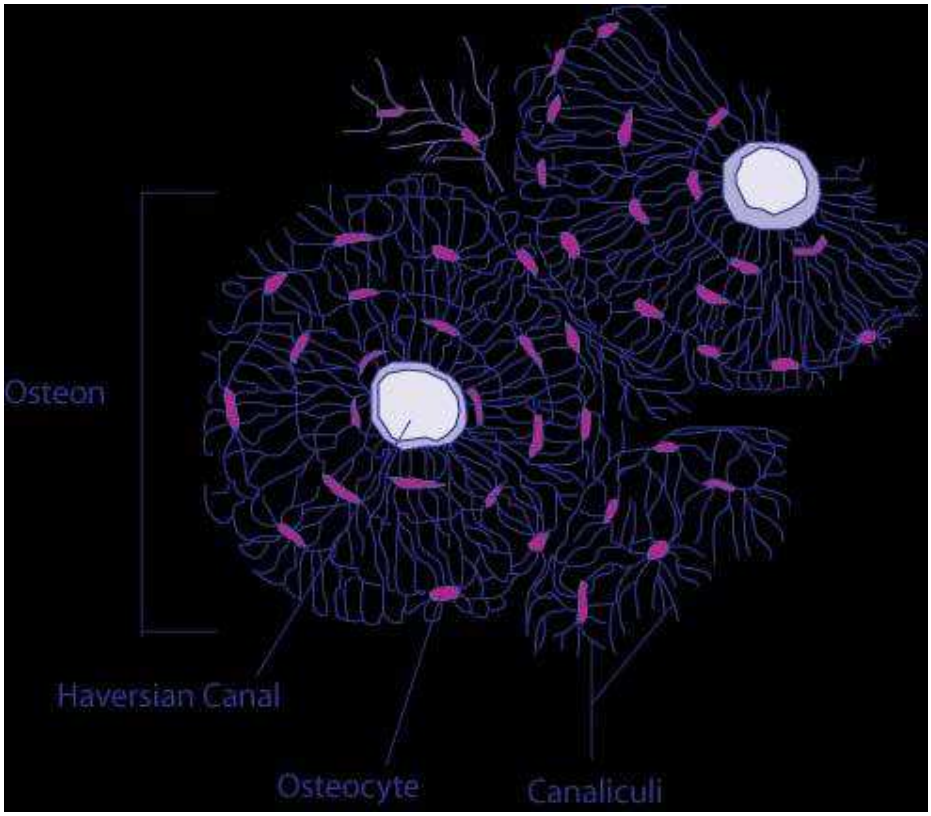
Location: Intervertebral discs; Pubic symphysis.

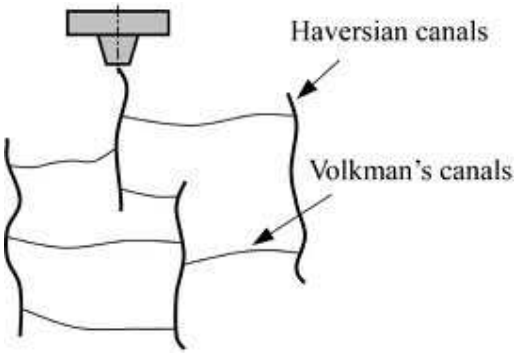


9. Explain Haversian system.

- ❖ Haversian system or Osteon is the unit of compact bone.
- ❖ A compact bone is lined by periosteum externally and endosteum internally.
- ❖ Many haversian systems are present in matrix between peri and endosteum.
- ❖ Each haversian system consists of a haversian canal, parallel to marrow cavity.
- ❖ Haversian canal is surrounded by concentric lamellae (rows of collagen fibres).
- ❖ Lacunae with osteocytes are present between lamellae.
- ❖ Minute radial canals known as Canaliculi arise from each lacuna.

- Canaliculi connect lacunae with one another and with the Haversian canal.
- Cytoplasmic processes of osteocytes extend into canaliculi.
- A haversian canal and the surrounding concentric lamellae and lacunae are collectively termed as 'HAVERSIAN SYSTEM or OSTEON'.
- Haversian canals communicate with marrow cavity, periosteum and one another through transverse or oblique Volkmann's canals. Blood vessels, lymph vessels and nerves extend through them.





10. Describe about different kinds of agranulocytes in blood of man?

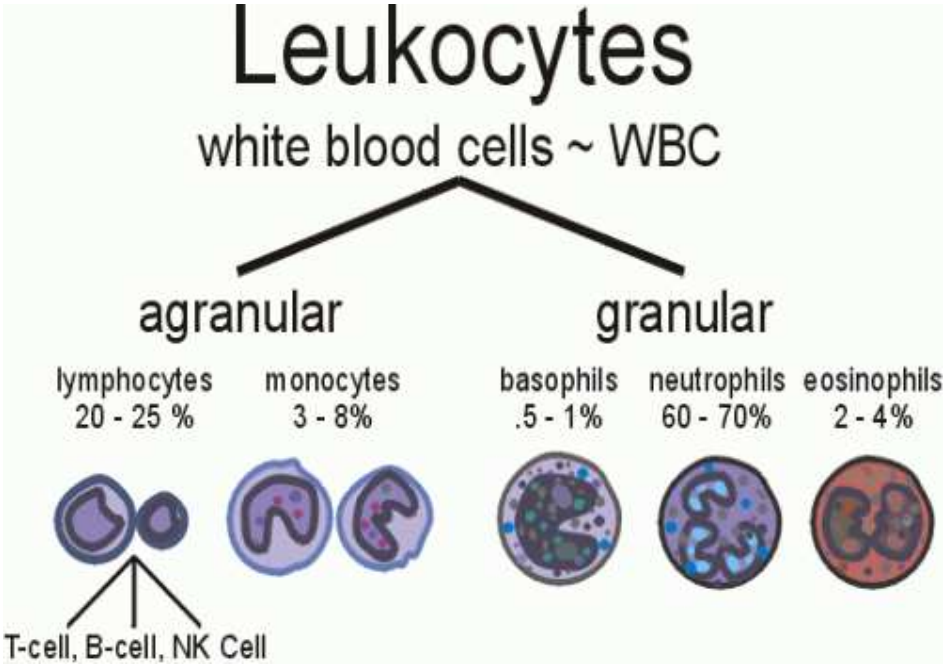
- Agranulocytes are leucocytes with only one type of granules in cytoplasm i.e., Azurophilic. Agranulocytes have unlobed nucleus.
- Agranulocytes are of two types like Lymphocytes and monocytes.
  a) **LYMPHOCYTES**: They occupy about 30% of leucocytes. They are spherical. They have spherical nucleus. They play an important role in immune reactions They can live for many years.

Lymphocytes are the only leucocyts which can return from the tissues back to the blood after Diapedesis.

b) **MONOCYTES**: They occupy about 5.3% of leucocytes.

Nucleus is kidney-shaped.

They differentiate into macrophages in connective tissues.



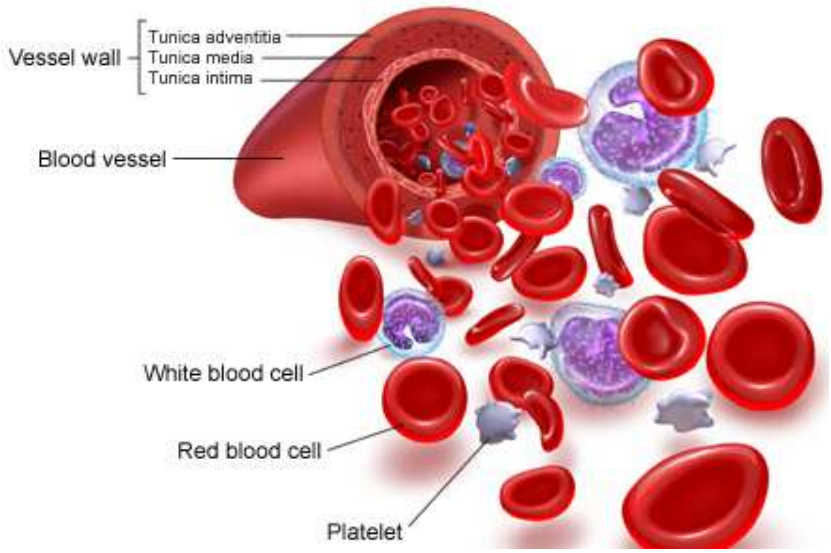
11. Describe about the kinds of Granulocytes present in the blood of man?

- Granulocytes are leucocytes with two types of granules in cytoplasm i.e., specific granules and Azurophilic granules. These are of three types.

Type of Granulocytes	**% of total WBC**	**Nucleus**	**Granules**	**Functions**
1.Neutrophils	62%	2-3 lobed (generally Three lobed) linked by chromatin threads	Small specific Granules are more than azurophilic	Active phagocytes
2.Eosinophils	2.3%	Bilobed nucleus	Many large specific Graules	Eosinophilia occurs At allergic actions. Phagocytose antig antibody complexes
3.Basophils	0.4%	Irregular lobed	Fewer specific Granules	Secreted heparin & Histamine. Similar to mast cells in function

12. Write notes on lymph?

- When the blood passes through the blood capillaries, due to diffusion, filtration and reabsorption, exchange of substances occurs between the blood and interstitial fluid occurs.
- Water and solutes in the blood plasma filter through the walls of capillaries to form the interstitial or tissue fluid. It is due to hydrostatic pressure of the blood.
- This filtration occurs near the arteriolar ends where the blood pressure is higher.
- The concentration of proteins is more in the plasma than in the interstitial fluid.
- This difference in protein concentration produces osmotic pressure.
- About 85% of fluid filtered out is returned to the capillaries near their venular ends by osmosis.
- Remaining fluid from the tissues drains into blind-ended lymph capillaries with highly permeable walls. It passes into larger lymphatic vessels and enters thoracic (left lymphatic duct) and right lymphatic duct. It enters into Subclavian vein.
- The interstitial fluid that passes into lymphatic vessels is known as lymph.
- Lymph is a colorless fluid. It differs from blood by the absence of RBCs.



IMPORTANT QUESTIONS:

VSAQs:

01. Two differences between hyaline cartilage and elastic cartilage? (March'06)
02. Characters of absorptive epithelium. Where is it present? (June '06; March'07)
03. Types of adipose tissue?
04. Haematocrit?
05. Intercalated discs?
06. Osteoblasts and osteoclasts?

SAQ:

01. Functions of epithelial tissue? (June'04 ; June'05)
02. 8 functions of blood? (March'05 ; March'07 ; May'07)
03. Haversian system? (March'06 ; March'10 ; June'10)
04. Agranulocytes? (May'06)
05. Simple epithelium?
06. Cells of connective tissue?
07. Types of cartilages? (March'11)

ANIMAL TISSUES (MUSCULAR & NERVOUS TISSUES)

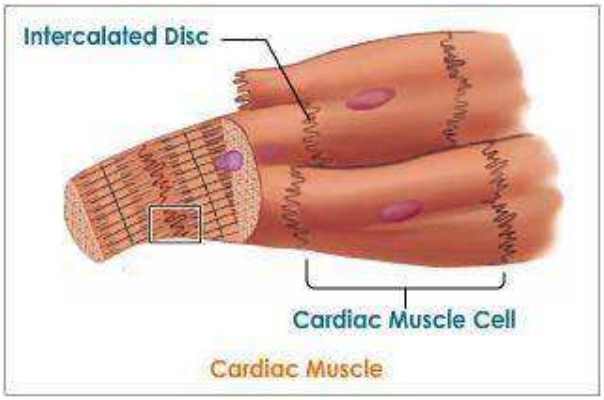
VERY SHORT ANSWER TYPE QUESTIONS

1. What are muscle spindles and Golgi tendon organs?

- Muscle spindles of skeletal muscles and Golgi tendon organs of tendons are encapsulated proprioceptors which detect tensional differences and monitoring the muscle contraction.

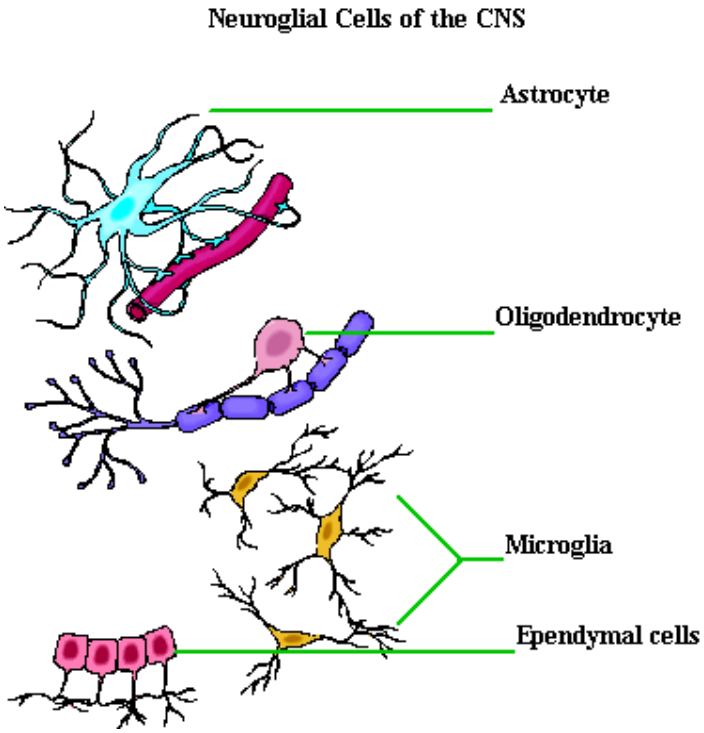
2. What are intercalated discs in muscles? Write their significance.

- Intercalated discs are present cardiac muscles.
- Cardiac muscle fibres are joined end to end by transverse thickenings of plasma membrane known as intercalated discs. They have gap junctions and desmosomes.
- They provide ionic continuity between adjacent cells.



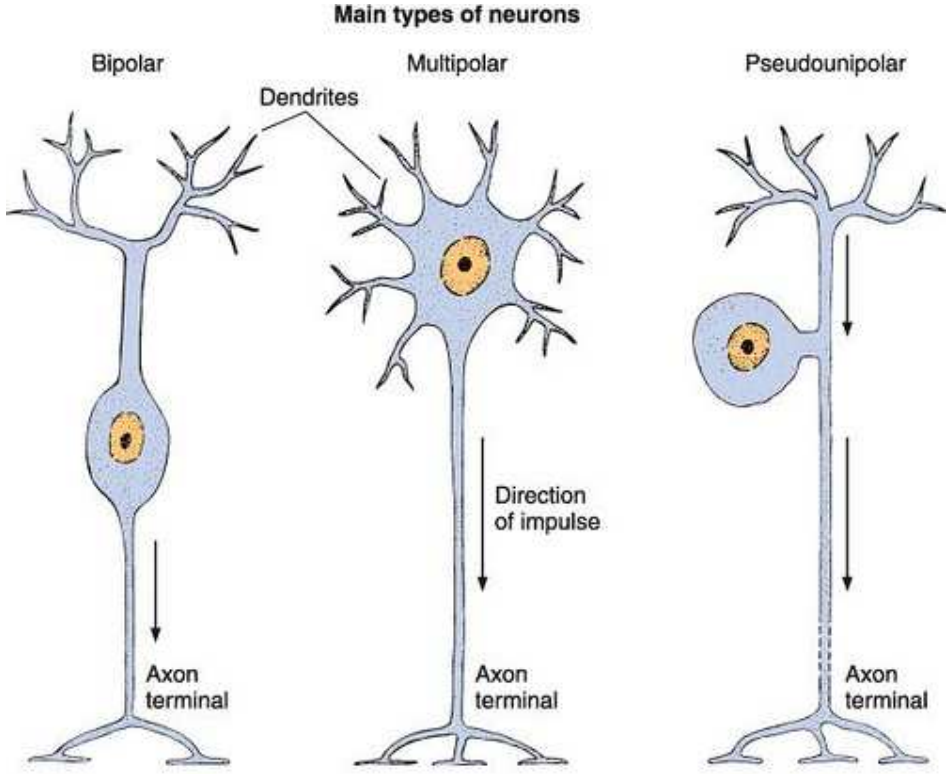
3. Which glial cells provide blood – brain barrier? Write the types of neuroglial cells in CNS.

- Asrocytes



4. What are pseudounipolar neurons?

- ❖ Unipolar neurons are also known as pseudounipolar neurons.
- ❖ They have a single process. It divides into two axonal branches; one extends to peripheral region and the other toward the CNS.
- ❖ They are present in dorsal root ganglia of spinal nerves.



5. What is Myelin sheath?

- ❖ Myelin sheath is whitish lipid layer formed around axon and secreted by Schwann cells.

6. What are microglia? Write their function.

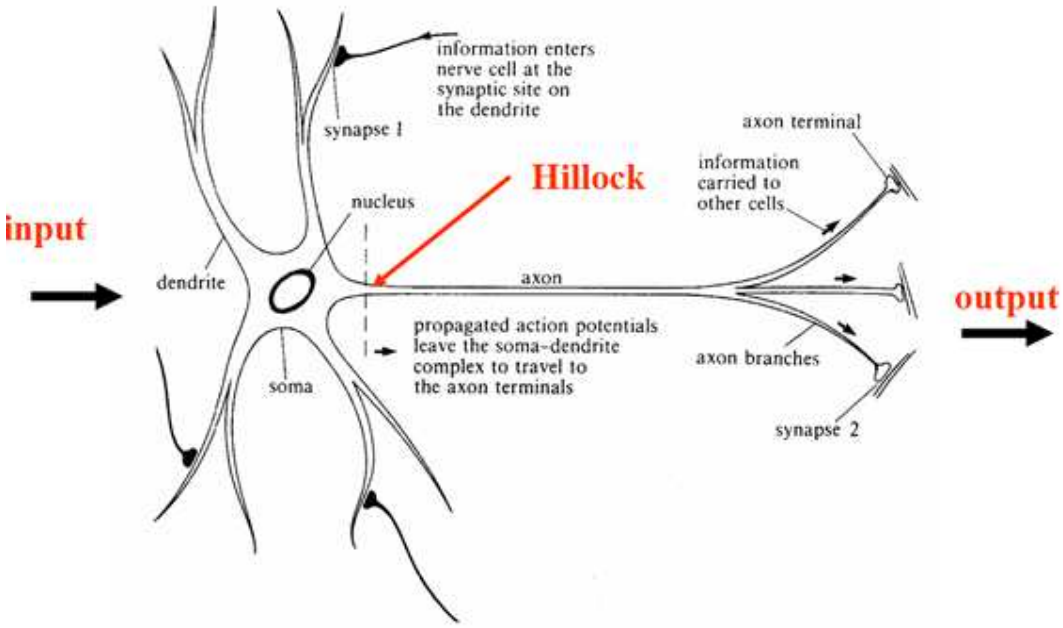
- ❖ Microglia are small, mesodermal elongated cells with short irregular processes.
- ❖ They represent the mononuclear phagocytic sytem and are derived from precursor cells in the bone marrow. When activated, they become phagocytic.

7. What are satellite cells and Pericytes?

- ❖ Satellite cells are mononucleate cells present within the basal lamina around each skeletal muscle fibre. They help in regeneration of new skeletal muscle fibres.
- ❖ Pericytes present in blood capillaries and venules of smooth muscles and help in regeneration.

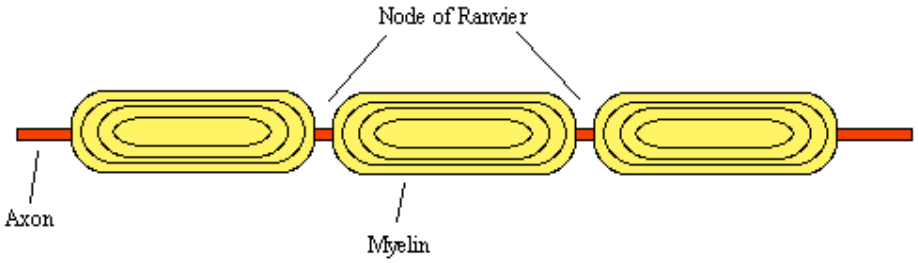
8. What is Axon hillock?

- ❖ Short cone-shaped region of perikaryon from which axon arises is axon hillock.



9. What are nodes of Ranvier?

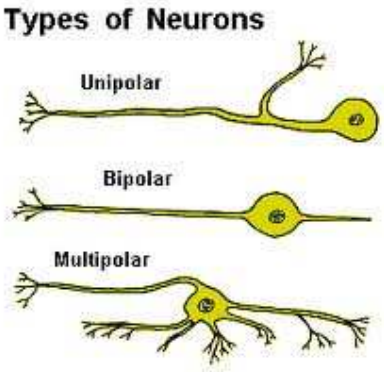
- Gaps in myelin sheath along the length of axon are known as nodes of Ranvier.



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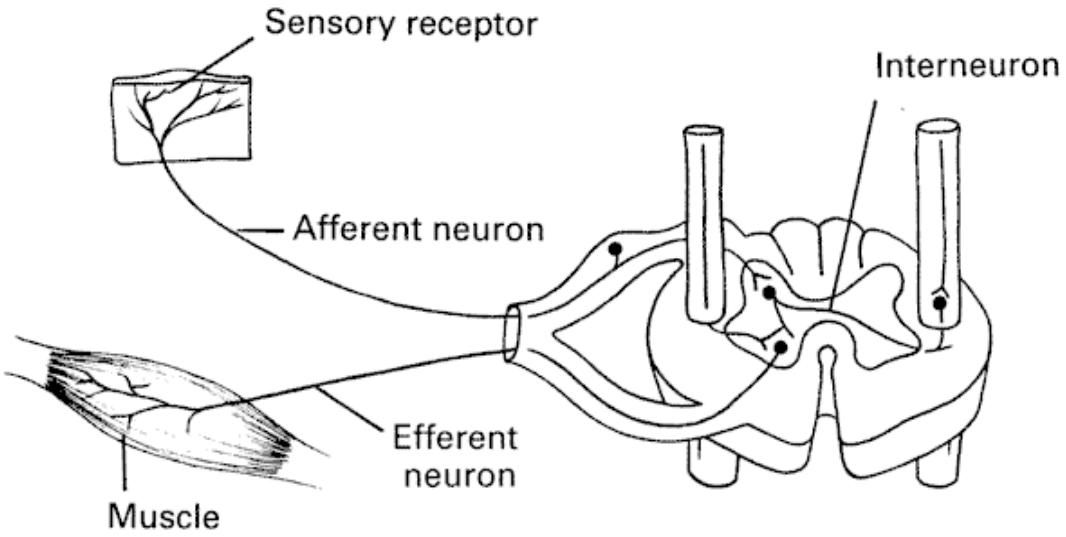
10. Differeniate between multipolar neuron and bipolar neuron.?

- Multipolar neuron has one axon and many dendrites. E.g.,Most of the neurons.
- Bipolar neuron has one dendrite and one axon. E.g., retina, inner ear and olfactory



11. Differentiate between Afferent neurons and Efferent neurons.

- Afferent neurons (sensory) receive sensory stimuli from surroundings and in body.
- Efferent (motor) neurons control effector organs like muscle fibres and glands.



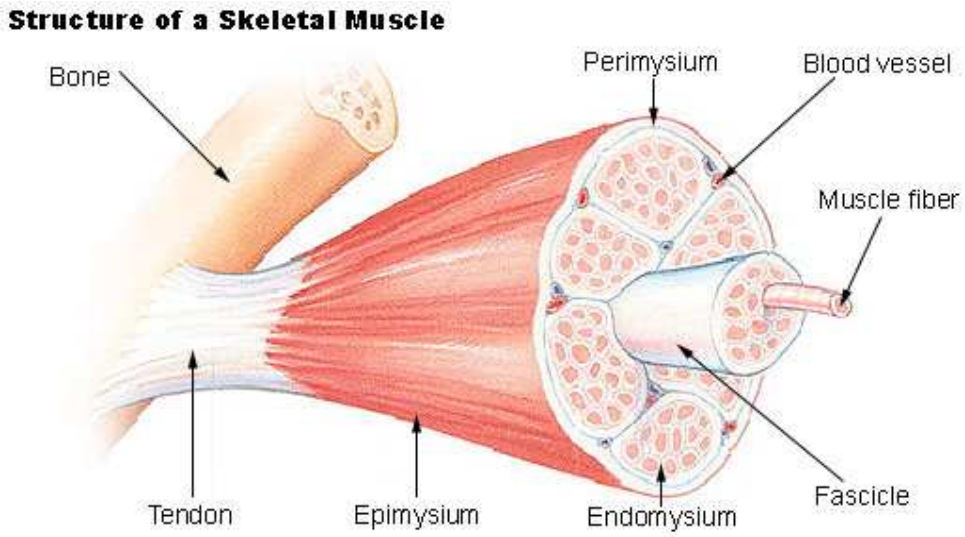
12. What are tracts and nuclei in CNs?

- Groups of nerve fibres in CNS are tracts.
- Aggregates of neuronal cell bodies in CNS are nuclei.

SHORT ANSWER TYPE QUESTIONS:

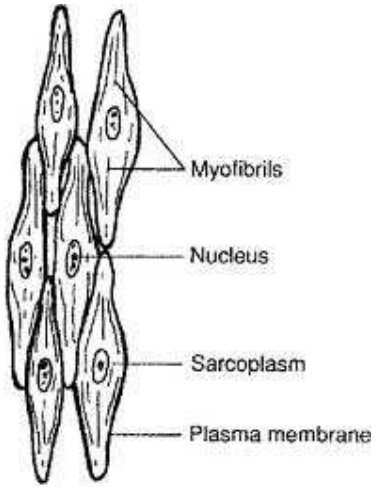
1. Describe the structure of a skeletal muscle fibre .

- Skeletal muscle fiber is a long cylindrical multinucleated cell.
- Nuclei are oval and peripheral.
- Each fiber is formed by the fusion of embryonic mononucleated myoblasts.
- Sarcoplasm has many myofibrils present parallel to long axis.
- Each myofibril has thick and thin myofilaments.
- Regular arrangement of them gives alternate dark and light bands of myofibrils.
- These bands of all myofibrils are precisely aligned and gives a striated appearance of whole muscle fiber.
- Sarcoplasm contains ATP, phosphocreatine, glycogen,myoglobin etc.



2. Describe smooth muscle?

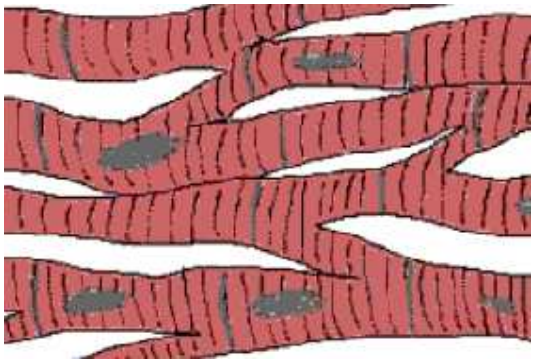
- Smooth muscles are present in the walls of viscera like blood vessels, trachea, bronchi, stomach, intestine, urinary bladder etc.
- Smooth muscle is also resent in Iris and ciliary body of eye.
- It also present in dermis of skin as arrector pili muscles attached to hair follicle
- These are fusiform. Each cell has a single nucleus present in the center of cell.
- Nucleus appears as a corkscrew when smooth muscle contracts.
- Thick and thin myofilaments are present but without regular arrangement.So these are unstriated.
- Smooth muscle exhibits involuntary, slow and prolonged contraction.
- They show more powers of regeneration.



3. Describe the structure of Cardiac muscle?

- Cardiac muscle occurs in the wall of heart. They are branched and form network.
- Each cardiac muscle fibre is a short cylindrical cel with one centrally located nucleus.

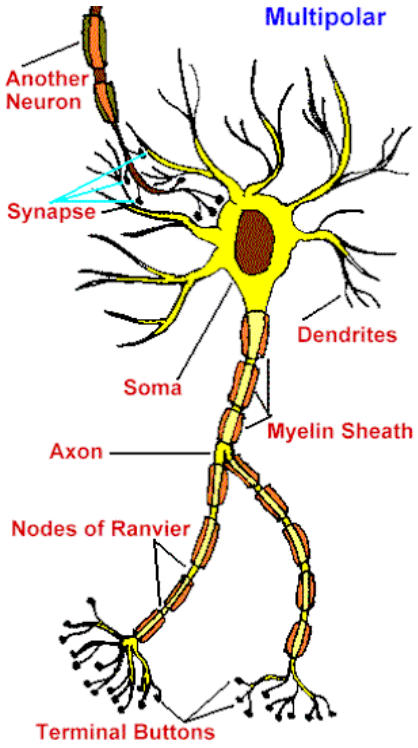
- Mitochondria are more numerous. Cardiac muscle fibers are striated.
- These muscles fibres are joined end to ends by transverse thickenings of plasma membrane known as intercalated discs.
- Intercalated discs contain gap junctions and desmosomes. They provide ionic continuity between adjacent cells.
- Due to gap junctions and reticular arrangement, cardiac muscle acts as functional syncytium.
- Contraction of this muscle is spontaneous, involuntary and rhythmic.



CARDIAC MUSCLE TISSUE

4. Describe the structure of Multipolar neuron.

- Multipolar neuron has a cell body and two types of processes like dendrites and axon.
- **CELL BODY** (Perikaryon or Soma or Cyton).. It has nucleus with nucleolus. Cytoplasm of it contains Nissl bodies, Golgi complex, mitochondria, neurofilaments , microtubules and lipofuscin pigments.
- **DENDRITES:** Short processes which divide into many branches to conduct impulses to cell body.
- **AXON:** It is single long cylindrical process arises from axon hillock of perikaryon.
- Axon is covered by axolemma with axoplasm.
- Axon gives collateral branches.
- Axon conducts nerve impulses away from cell body to other nerve cells and effectors.
- Axon terminates as small branches known as Terminal arborizations. These branches end small swellings known as terminal boutons.



IMPORTANT QUESTIONS:

SAQ:

01. Multipolar neuron? (March ’09)
02. Skeletal muscle fibre?
03. Cardiac muscle/

VSAQ

01. Describe schwann sheath. Write its significance. ? (June’05 ; March’08 ; June ’10)
02. Glial cells associated with blood-brain barrier? (May’09)
03. What are microglia. What is their function? (March ’10)
04. What are nodes of Ranvier?
05. What are muscle spindles and Golgi tendon organs?