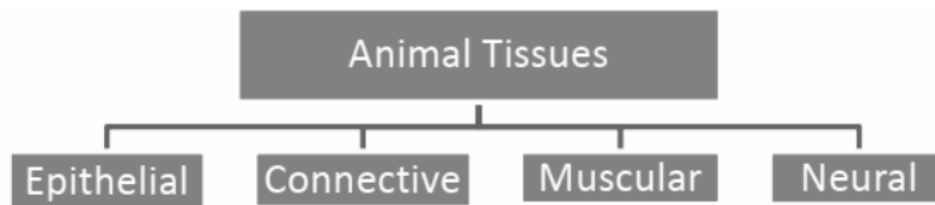


# STRUCTURAL ORGANISATION IN ANIMALS

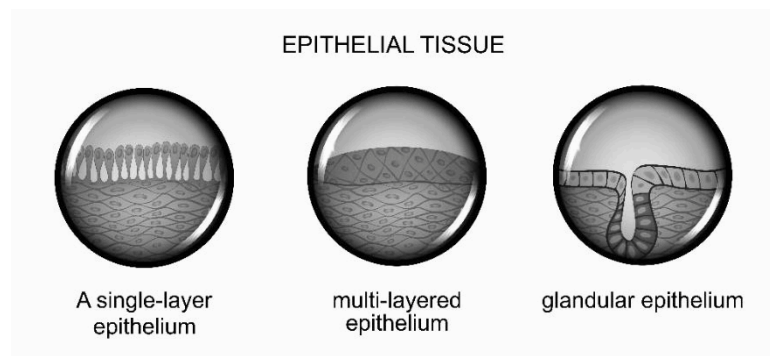
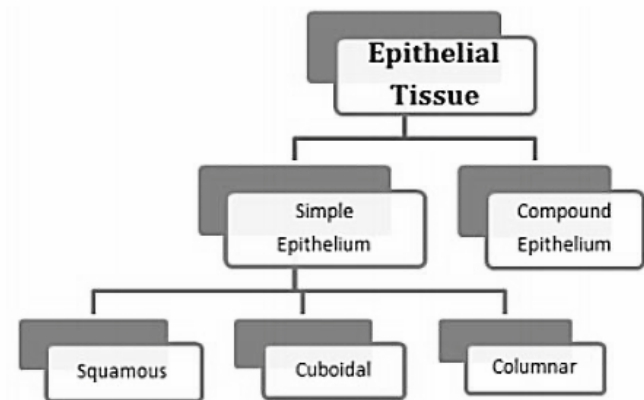
## Introduction

- In multicellular organisms a group of similar cells along with intercellular substances perform a specific function.
- Such an organization is called tissue.



## Epithelial Tissue

- This tissue provides a covering or lining for some parts of the body. Cells are compactly packed without intercellular space.
- Simple epithelium is composed of single layers of cells and function as lining of body cavities, ducts and tubes.
- The compound epithelium consists of two or more than two layers of cells and has protective function.
- The squamous epithelium made up of single layer of flattened cells with irregular boundaries. They are present in blood vessels, air sacs of lungs.
- Cuboidal epithelium is made up of single layered cube-like cells and found in ducts of glands and tubular part of nephron of kidney for absorption and secretion.
- Columnar epitheliums are made up of tall and slender cells. The nuclei are located at the base.
- Free surface may have microvilli found in the lining of stomach and intestine.
- The ciliated one are called as ciliated epithelium.
- Columnar and cuboidal epithelium specialized for secretion are known as glandular epithelium, which may be unicellular as in goblet cells of alimentary canal or multicellular as in salivary gland.
- Main function of compound epithelium tissue is to provide protection chemical and mechanical stress.



- They cover the dry surface of skin, moist surface of buccal cavity etc.
- Epithelial cells are held together by intercellular material to form specialized junction.

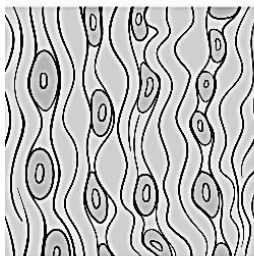
Endocrine glands	Exocrine glands
a. Secrete enzymes, milk, mucus, saliva etc.	a. Exocrine gland secretes hormones.
b. Products are released through ducts.	b. Products are directly released at target sites through blood.

## Connective Tissue

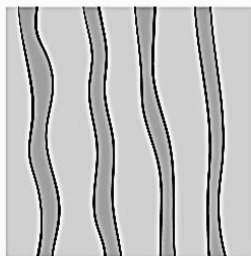
- They are most abundant and widely distributed tissues which link and support the other tissues.
- All connective tissue except blood, cell secretes fibres of structural protein called collagen or elastin to provide elasticity and flexibility.
- **Loose Connective Tissues** contain cells and fibres loosely arranged in semi-fluid ground substance.
- It includes areolar tissue and adipose tissue.

Areolar Connective Tissue	Adipose Connective Tissue
a. It contains fibroblast, macrophages, and mast cells.	a. fibroblast, macrophages and mast cells are absent.
b. It acts as support framework for epithelium.	b. The cells are specialized to store fats beneath the skin.

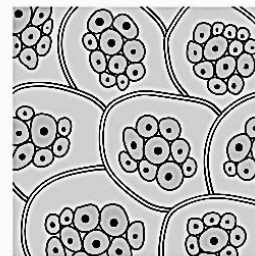
- **Dense connective Tissue** contains fibres and fibroblast compactly packed.
- The orientation of fibres may be regular or irregular pattern.
- In dense regular connective tissues collagen fibres are present in rows between parallel bundles of fibres as in tendons and ligaments.



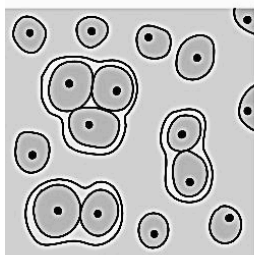
Elastic connective tissue



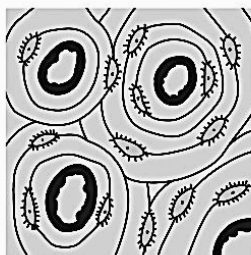
Dense connective tissue



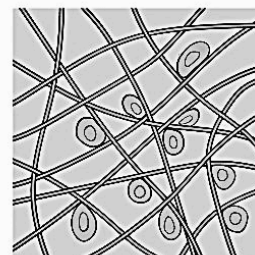
Adipose connective tissue



Cartilaginous  
connective tissue



Bone connective tissue



Loose connective tissue

Tendon	Ligament
a. Tendon connects bones to skeletal muscles.	a. Ligament connects one bone to another bone.
b. It is made up of white fibrous tough tissue.	b. It is made up of yellow elastic tissue with collagen fibres.

- Cartilage, bones, and blood are specialized connective tissue.
- Blood is fluid connective tissue containing plasma, red blood cells, white blood cells and platelets. It helps in transportation of various substances between organs.

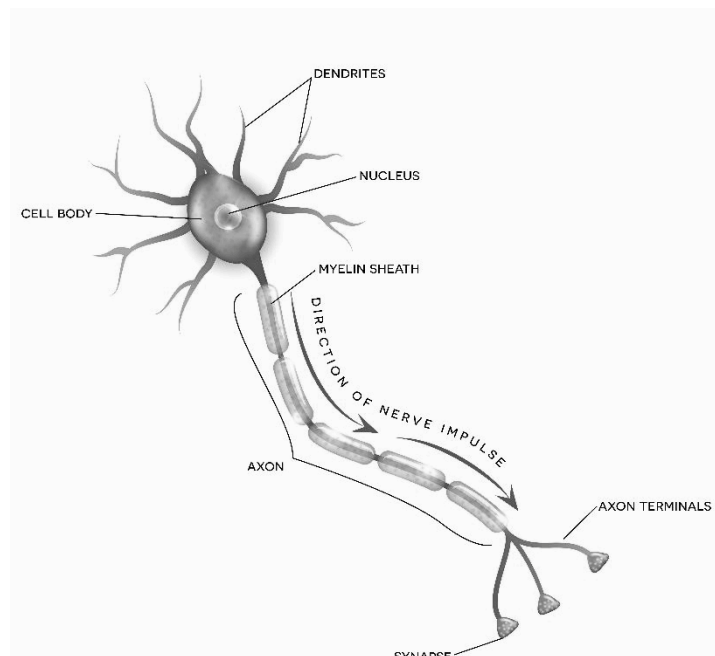
## Muscle Tissue

- Each muscle is made up of long cylindrical fibres arranged parallel to each other.
- Fibres are composed of fine fibrils called myofibrils.
- Muscle fibres contract and relax in response to stimulation.

Skeletal	Smooth	Cardiac
a. They are also known as striated, voluntary muscles.	a. They are known as unstriated or involuntary muscles.	a. They are known as heart muscles and involuntary in nature.
b. Multinucleated with light and dark bands.	b. They are uninucleate without bands.	b. Uninucleate with faint light and dark bands.
c. They are attached with bones.	c. They are present in vessels, esophagus.	c. They are present in wall of heart.
d. They are fibrous and un-branched, cylindrical in shape.	d. They are fibrous and un-branched, spindle shaped.	d. They are fibrous and branched, cylindrical in shape.

## Nervous Tissue

- The unit of neural system is neuron. Neuroglial cells protect and supports the neuron.
- When neuron get stimulated, electrical impulses are generated that travel along the plasma membrane (axon).
- The tissues organize to form organs which in turn associate to form organ system in multicellular organisms.



# Exercise

## OBJECTIVE TYPE QUESTIONS

- (1) Tissue is
  - (a) a group of similar cells together with their intercellular substances, which perform a specific function
  - (b) a single specialised cell with specified functions
  - (c) composed of a single layer of cuboidal cells
  - (d) Both (a) and (c)
- (2) Which one of the following options is associated with epithelium?
  - (a) Cells are compactly packed with little intercellular matrix
  - (b) Cells are loosely packed with large intercellular matrix
  - (c) It is highly vascularised
  - (d) It is a supporting tissue
- (3) The cells of squamous epithelium are
  - (a) multi-layered and thick
  - (b) flat and thick
  - (c) thin with rigid boundaries
  - (d) flat with irregular boundaries
- (4) Choose the correctly matched pair. **CBSE-AIPMT 2014**
  - (a) Inner lining of salivary ducts-Ciliated epithelium
  - (b) Moist surface of the buccal cavity-Glandular epithelium
  - (c) Tubular parts of nephrons-Cuboidal epithelium
  - (d) Inner surface of the bronchioles-Squamous epithelium
- (5) Which of the following epithelium types helps in the secretion and absorption of nutrients?
  - (a) Cuboidal
  - (b) Stratified squamous
  - (c) Squamous
  - (d) Columnar
- (6) The ciliated epithelial cells are required to move particles or mucus in a specific direction. In humans, these cells are mainly present in **NEET 2019**
  - (a) Fallopian tubes and pancreatic duct
  - (b) eustachian tube and salivary duct
  - (c) bronchioles and Fallopian tubes
  - (d) bile duct and bronchioles
- (7) Goblet cells of the alimentary canal are a type of
  - (a) intercellular gland
  - (b) multicellular gland
  - (c) unicellular gland
  - (d) None of these
- (8) Which of the following secretions are released through ducts in the human body?
  - (a) Oil and milk
  - (b) Mucus and ear wax
  - (c) Digestive enzymes
  - (d) All of these
- (9) Compound epithelium
  - (a) plays a major role in the secretion and absorption
  - (b) provides protection against chemical and mechanical stresses
  - (c) covers only the dry surface of the skin
  - (d) All of the above

- (10) Which of the following tissues performs the function of linking and supporting other tissues of the body?
- (a) Epithelial tissue (b) Muscular tissue  
(c) Connective tissue (d) Nervous tissue
- (11) Choose the correctly matched pair. **CBSE-AIPMT 2014**
- (a) Tendon-Specialised connective tissue  
(b) Adipose Tissue-Dense connective tissue  
(c) Areolar Tissue-Loose connective tissue  
(d) Cartilage-Loose connective tissue
- (12) The most abundant and widely distributed tissue in the animal body is
- (a) epithelium tissue (b) connective tissue  
(c) skeletal muscle tissue (d) smooth muscle tissue
- (13) Examples of specialised connective tissue is/are
- (a) bone (b) cartilage  
(c) blood (d) All of these
- (14) Which of the following cells is/are contained in areolar connective tissue?
- (a) Mast cells (b) Fibroblasts  
(c) Macrophages (d) All of these
- (15) Adipose tissue is a type of
- (a) loose connective tissue (b) dense connective tissue  
(c) specialised connective tissue (d) None of the above
- (16) Tendon is an example of which of the following connective tissue?
- (a) Loose connective tissue (b) Dense connective tissue  
(c) Specialised connective tissue (d) All of the above
- (17) Matrix-secreting cells of cartilage are known as
- (a) chondrocytes (b) osteoblasts  
(c) fibroblasts (d) mast cells
- (18) In humans, the cartilage
- (a) contains solid and pliable intercellular material  
(b) in vertebrate embryos gets replaced by bones in adults  
(c) is found in between the bones of vertebral column  
(d) All of the above
- (19) Cells, which help in the formation of bones are called
- (a) chondroblasts (b) osteoblasts  
(c) osteoclasts (d) chondroclasts
- (20) The bone marrow of long bones is the site of
- (a) production of WBCs (b) production of RBCs  
(c) production of blood cells (d) breakdown of RBCs

- (21) Bones in the human body perform all the listed functions except  
 (a) weight-bearing function  
 (b) destruction of worn-out blood cells  
 (c) provide the site for the attachment of skeletal muscles  
 (d) protect soft tissues and organs
- (22) Skeletal muscles are found in  
 (a) heart (b) blood vessels  
 (c) biceps (d) intestine
- (23) Smooth muscles are **NEET 2016**  
 (a) involuntary, fusiform, non-striated (b) voluntary, multinucleate, cylindrical  
 (c) involuntary, cylindrical, striated (d) voluntary, spindle-shaped, uninucleate
- (24) In a tissue, the structure of cells varies according to their  
 (a) origin (b) function  
 (c) gene content (d) None of these
- (25) Which of the following tissues provide a covering layer for some of the body parts?  
 (a) Connective tissue (b) Muscular tissue  
 (c) Epithelial tissue (d) Neural tissue
- (26) Lining of body cavities, ducts and tubes are made up of  
 (a) compound epithelium (b) simple epithelium  
 (c) cuboidal epithelium (d) keratinised epithelium
- (27) Which of the following is not a function of epithelium?  
 (a) Protection (b) Connection  
 (c) Secretion or Excretion (d) Absorption
- (28) The endothelium of blood vessels is made up of simple  
 (a) cuboidal epithelium (b) squamous epithelium  
 (c) columnar epithelium (d) non-ciliated columnar epithelium
- (29) The cavities of the alveoli of human lungs are lined by  
 (a) cuboidal epithelium (b) columnar epithelium  
 (c) stratified cuboidal epithelium (d) squamous epithelium
- (30) The type of tissue lining in the nasal passage and the bronchioles is  
 (a) columnar ciliated epithelium (b) cuboidal epithelium  
 (c) neurosensory epithelium (d) germinal epithelium

# Answer Key

## OBJECTIVE TYPE QUESTIONS

- (1) (A)
- (2) (A)
- (3) (D)
- (4) (C)
- (5) (D)
- (6) (C)
- (7) (C)
- (8) (D)
- (9) (B)
- (10) (C)

- (11) (C)
- (12) (B)
- (13) (D)
- (14) (D)
- (15) (A)
- (16) (B)
- (17) (A)
- (18) (D)
- (19) (B)
- (20) (C)

- (21) (B)
- (22) (C)
- (23) (A)
- (24) (B)
- (25) (C)
- (26) (B)
- (27) (B)
- (28) (B)
- (29) (D)
- (30) (A)