Question Bank
The Tissues

1. Define the following :

(a) Differentiation **(b)** Meristem

(c) Lymph **(d)** Blood

(e) Tissue

Ans. (a) Differentiation is the process by which unspecialised structures become modified and specialised for performing specific functions.

(b) Meristems are the sites or regions within the plant body where formation of new meristematic cells takes place.

(c) Lymph is another fluid connective tissue consisting of plasma and mainly white blood cells.

(d) Blood is a bright-red coloured fluid connective tissue.

(e) A group of cells similar in structure, having a common origin and performing similar functions is called a tissue.

2. Name the following :

(i) Components of xylem

(ii) Components of phloem

(iii) Two main types of plant tissues

(iv) Main types of animal tissues

(v) Different types of epitheliums

Ans. (i) Tracheids, Vessels, Xylem parenchyma and xylem sclerenchyma

(ii) Sieve tubes, Companion cells, Phloem parenchyma and Phloem fibres

(iii) Meristematic tissues and Permanent tissues

(iv) Epithelial tissue, Connective tissue, Muscular tissue and Nervous tissue

(v) Squamous epithelium, Columnar epithelium, Cuboidal epithelium, Ciliated epithelium, Sensory epithelium, Stratified epithelium.

3. Describe the main features of parenchyma, collenchyma and sclerenchyma.

Ans. (a) Parenchyma

(i) Parenchyma is a primitive simple tissue made up of cells which are similar in structure and function; it has given rise to the other types of tissues.

(ii) Cells are living, thin-walled and contain dense cytoplasm cell wall is made up of cellulose.

(iii) Cells are usually isodiametric; sometimes they may be lobed or elongated.

(iv) Intercellular spaces may or may not be present.

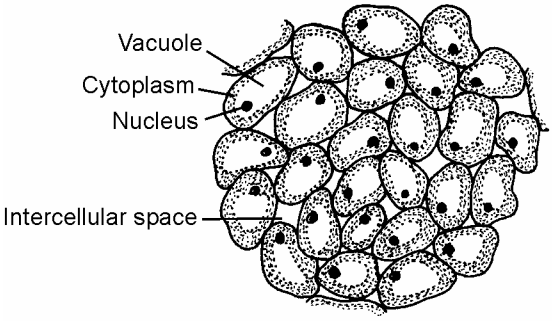

Fig : Parenchyma cells

(b) Collenchyma

(i) Collenchyma, like parenchyma, is a simple tissue.

(ii) Cells are living and thick-walled; thickenings are present at the corners of the cells and contain cellulose and pectin; lignin is never present.

(iii) Intercellular spaces are absent.

(iv) Cells may be circular, oval or polygonal in shape.

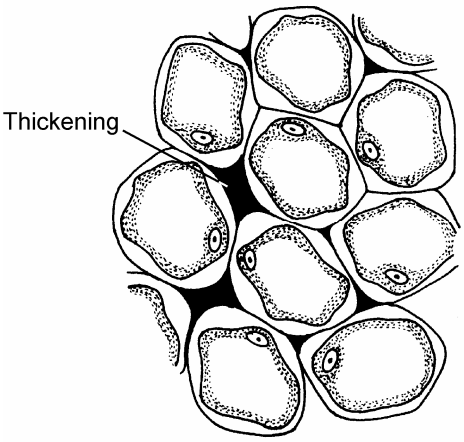

Fig : Collenchyma cells

(c) Sclerenchyma

(i) Like parenchyma and collenchyma, sclerenchyma is also a simple tissue.

(ii) Cells are dead and possess hard, rigid, very thick lignified walls; lignin is a waterproof material.

(iii) Intercellular spaces are absent.

(iv) Sclerenchyma cells are of two types — **fibres** which are long, narrow, pointed cells, and sclereids which are shorter, isodiametric or irregular cells; **sclereids** are also called **stone cells** or **grit cells**.

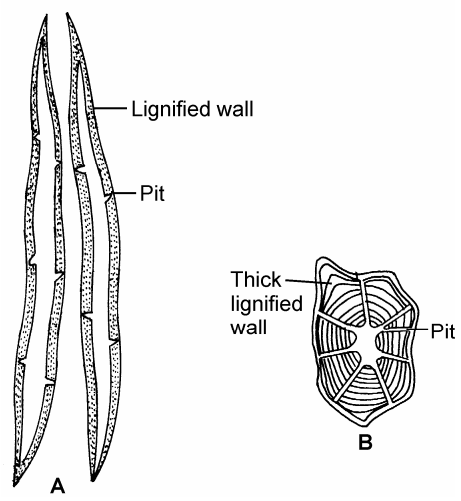

Fig :Slerenchyma : A. fibres B. Sclereids

(v) The walls of sclerenchyma cells contain oblique thin areas called pits.

4. Write the main functions of blood.

Ans. (i) Transport of oxygen and carbon dioxide : Blood carries oxygen from the respiring organs to the tissues, and carbon dioxide from the tissues to the respiring organs.

(ii) Transport of food materials : Blood transports the digested food from the alimentary canal to various organs of the body.

(iii) Transport of excretory products : Excretory products are transported by blood to the kidneys, from where they are eliminated.

(iv) Protection from diseases : The white blood cells destroy the disease-causing organisms by engulfing, in some cases antitoxins and antibodies are produced, thus protecting the body from diseases.

(v) Temperature regulation : Blood distributes heat within the body and helps in maintaining body temperature.

(vi) Role in blood clotting : Loss of blood from the body is prevented by the formation of clot, at the site of blood loss.

5. Write the functions of the following : (i) Cartilage, (ii) Tendon and (iii) Ligament

Ans. (i) Cartilage : Cartilage performs the function of providing support and flexibility to the vertebrate body.

(ii) Tendon : It connects muscles to bones.

(iii) Ligament : Ligaments connect one bone to another bone.

6. Write differences between the following :

(i) Blood and lymph **(ii)** Cartilage and bone

Ans. (i)

Differences between Blood and Lymph	
Blood	**Lymph**
1. It consists of plasma, RBCs, WBCs and platelets.	It consists of plasma and leucocytes, no RBCs and platelets.
2. It is red in colour due to the presence of haemoglobin in RBCs.	It is colourless, haemoglobin is absent.
3. It mainly transports oxygen and carbon dioxide.	It transports materials from the blood to tissue fluids and vice versa.

(ii)

Differences between Cartilage and Bone	
Cartilage	**Bone**
1. It is soft and flexible.	It is hard and inflexible.
2. It is nonporous.	It is porous.
3. Blood vessels are absent.	Blood vessels are present.
4. Matrix is made up of proteins.	Matrix is made up of salts of calcium and magnesium (mainly calcium phosphate).
5. Bone marrow is absent.	Bone marrow (which produces blood cells) is present.
6. Matrix occurs as a homogeneous mass, it is non-lamellar.	Matrix occurs in lamellae.

7. Multiple choice questions.

(i) Muscles responsible for movement of food in stomach are

(a) cardiac **(b)** striated
(c) unstriated **(d)** none of these

(ii) Tendons connect

(a) nerve to muscle **(b)** muscle to muscle
(c) bone to bone **(d)** bone to muscle

(iii) Which of these components of blood fights infection?

(a) Red blood cells **(b)** White blood cells
(c) Platelets **(d)** All of these

(iv) Cardiac muscle is

(a) striated **(b)** involuntary
(c) smooth **(d)** both (a) and (b) are correct.

(v) Tendons and ligaments are

(a) connective tissue **(b)** associated with the bones
(c) found in vertebrates **(d)** all the above

(vi) Which tissue has cells in lacunae?

(a) Epithelial tissue **(b)** Cartilage
(c) Bone **(d)** Both (b) and (c)

(vii) Which of these is not an epithelial tissue?

(a) Bone and cartilage
(b) Simple cuboidal and stratified columnar
(c) Stratified squamous and simple squamous
(d) All of these are epithelial tissue.

Ans. i. (b), **ii.** (d), **iii.** (b), **iv.** (d), **v.** (d), **vi.** (b), **vii.** (a)

8. Write the characteristics of the following :

(i) Striated muscle

(ii) Cardiac muscle

(iii) Nervous tissue

Ans. (i) Striated Muscles

- Also known as **striped, skeletal or voluntary muscles,** these occur in bundles, normally attached to the bones and help in body movement.
- Each muscle fibre is long, cylindrical, unbranched and non-tapering, with **multinucleate** (coenocytic) condition.
- Sarcolemma (the membrane around the muscle cell) is present.
- The myofibrils are tightly packed.
- Under the microscope, each striated muscle fibre shows **striations.** These are just alternating light and dark bands placed at right angle to the long axis.
- These muscles can contract rapidly and are responsible for the quick movements.
- These muscles are called **voluntary** because their contraction is under the control of mind or will.
- These occur in the limbs, body wall, face and neck.

(ii) Cardiac Muscles

- Cardiac muscles are composed of branching and anastomosing network of fibres.
- The fibres have centrally located one or two nuclei and transverse striations with light and dark bands.
- Special electrical junctions called **intercalated discs** are present at intervals in the fibres.
- Cardiac muscles show characters of both striated and unstriated muscles.
- Cardiac muscles are richly supplied with blood.
- These muscles occur only in the walls of the heart.
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- Cardiac muscles (though striated in structure) are involuntary in nature. They are not under the control of one's will. They keep on performing their function throughout life.

(iii) Nervous Tissue

- Nervous tissue is a very specialised tissue for receiving stimuli or sensations and transmitting messages. It is present in brain, spinal cord and nerves.
- **Nerve cells or neurons** form the most important elements of the nervous tissue.
- Each neuron consists of three parts —
  1. the main body called the **cell body or cyton,**
  2. the **dendrons,** and
  3. the **axon.**
  — The dendrons are one or more short processes arising from the cyton.
  — Dendrons branch further into many thin **dendrites. The dendrites receive impulses**.
  — The axon is a single, long, cylindrical process arising from the cyton. **The axon** forms fine branches at its terminal end, and **takes impulses away from the cell body.**
- Nerve cells are joined end to end forming long nerve **fibres.** Nerve fibres branch out to every part of the body.