Multiple Choice Questions

1. Which of the following tissues has dead cells?

(a) Parenchyma (b) Sclerenchyma (c) Collenchyma (d) Epithelial tissue

Answer: (b) Sclerenchyma

Explanation: Parenchyma cells have thin cellulosic cell walls. Collenchyma cells have thicker cellulosic walls and also may have pectin deposition in the corners. Sclerenchyma cells have thick lignified cell walls and are dead at maturity and provide protection to the different parts of the body. Epithelial cells are thin-walled and living.

2. Find the incorrect sentence

(a) Parenchymatous tissues have intercellular spaces

(b) Collenchymatous tissues are irregularly thickened at corners

(c) Apical and intercalary meristems are permanent tissues

(d) Meristematic tissues, in its early stage, lack vacuoles

Answer: (c) Apical and intercalary meristems are permanent tissues

Explanation: Meristematic tissues are dividing tissue. They are not specialized to perform a specific function. They are responsible for the growth of plants. When meristematic tissue takes up a specific role and loses its ability to divide, it becomes a permanent tissue. Hence, the statement “Apical and Intercalary meristem are permanent tissue” is wrong.

3. The girth of the stem increases due to

(a) apical meristem (b) lateral meristem (c) intercalary meristem (d) vertical meristem

Answer: (b) lateral meristem

Explanation: Lateral meristem is responsible for secondary growth. Cell division in meristematic tissues widens the diameter and ultimately increases girth. Whereas, the apical meristem is responsible for extension in root and shoot and intercalary meristem boosts the growth of plant parts.

4. Which cell does not have a perforated cell wall?

(a) Tracheids (b) Companion cells (c) Sieve tubes (d) Vessels

Answer: (b) Companion cells

Explanation: The cell wall that has pores and holes is called a perforated cell wall. It is obligatory to have a passage for water transport in tracheids, Sieve tubes, and vessels because they perform the function of conduction and water transport. Besides, companion cells are living and they do not have perforated cell walls.

5. The intestine absorbs the digested food materials. What type of epithelial cells are responsible for that?

(a) Stratified squamous epithelium (b) Columnar epithelium

(c) Spindle fibres (d) Cuboidal epithelium

Answer: (b) Columnar epithelium

Explanation: Columnar epithelium consists of pillar-like cells that are much taller than wide. The nuclei are generally elongated along the long axis of cells. It lines the stomach, intestine, and gall bladder. The columnar epithelium of the intestine is specialized for the absorption of water and digested food.

6. A person met with an accident in which two long bones of hand were dislocated. Which among the following may be the possible reason?

(a) Tendon break (b) Break of skeletal muscle

(c) Ligament break (d) Areolar tissue break

Answer: (c) Ligament break

Explanation: The ligament is a fibrous connective tissue, which connects bone to another bone. Hence, breakage of the ligament can be the reason for dislocation.

7. While doing work and running, you move your organs like hands, legs etc. Which among the following is correct?

(a) Smooth muscles contract and pull the ligament to move the bones

(b) Smooth muscles contract and pull the tendons to move the bones

(c) Skeletal muscles contract and pull the ligament to move the bones

(d) Skeletal muscles contract and pull the tendon to move the bones

Answer: (d) Skeletal muscles contract and pull the tendon to move the bones

Explanation: Skeletal muscles are the most abundant tissues in the body. These are responsible for locomotion, voluntary movement, contraction, and relaxation of muscles. The tendon is a flexible tissue that joins muscles to the bones.

8. Which muscles act involuntarily?

(i) Striated muscles (ii) Smooth muscles (iii) Cardiac muscles (iv) Skeletal muscles

(a) (i) and (ii)

(b) (ii) and (iii)

(c) (iii) and (iv)

(d) (i) and (iv)

Answer: (b) (ii) and (iii)

Explanation: Involuntary muscles cannot be controlled consciously. These are mainly present in the muscles of the abdominal regions, cardiac muscles, locomotory muscles, middle ear muscles, and the diaphragm. Skeletal muscles are voluntary, under one's control.

9. Meristematic tissues in plants are

(a) localized and permanent (b) not limited to certain regions

(c) localized and dividing cells (d) growing in volume

Answer: (c) localized and dividing cells

Explanation: Meristematic tissues can divide and re-divide continuously. These are found in growing parts of the plant.

10. Which is not a function of epidermis?

(a) Protection from adverse conditions (b) Gaseous exchange

(c) Conduction of water (d) Transpiration

Answer: (c) Conduction of water

Explanation: Epidermis is the outermost layer of cells covering a plant. Its functions are principally to protect the plant from injury or adverse conditions and to reduce water loss. It also helps in gaseous exchange and transpiration as it possesses stomata. Conduction of water occurs by the xylem which is a complex permanent tissue.

11. Select the incorrect sentence

(a) Blood has a matrix containing proteins, salts, and hormones

(b) Two bones are connected with ligament

(c) Tendons are non-fibrous tissue and fragile

(d) Cartilage is a form of connective tissue

Answer: (c) Tendons are non-fibrous tissue and fragile

Explanation: Tendons are white fibrous connective tissues that have great strength and join skeletal muscles with bones. Tendons are extremely elastic and viscous.

12. Cartilage is not found in

(a) nose (b) ear (c) kidney (d) larynx

Answer: (c) kidney

Explanation: Cartilage is a connective tissue which provides support and flexibility to various parts of our body. Cartilage is found in the nose, ear, and larynx but not in the kidney.

Renal tubules and corpuscles in the kidney are formed by Cuboidal epithelium tissue.

13. Fats are stored in the human body as

(a) cuboidal epithelium (b) adipose tissue (c) bones (d) cartilage

Answer: (b) adipose tissue

Explanation: Adipose tissue present below the skin and between internal organs stores fat. Cells in these tissues are filled with fat globules. Fat storage acts as an insulator.

14. Bone matrix is rich in

(a) fluoride and calcium (b) calcium and phosphorus

(c) calcium and potassium (d) phosphorus and potassium

Answer: (b) calcium and phosphorus

Explanation: The bone matrix consists of bone minerals it including calcium and phosphorus with small amounts of magnesium sodium and bicarbonate.

15. Contractile proteins are found in

(a) bones (b) blood (c) muscles (d) cartilage

Answer: (c) muscles

Explanation: Muscle cells have contractile proteins in them. These proteins are responsible for the contraction and relaxation of muscles.

16. Voluntary muscles are found in

(a) alimentary canal (b) limbs (c) iris of the eye (d) bronchi of lungs

Answer: (c) muscles

Explanation: Muscles possess the ability to contract and relax. Contractile proteins help in the moderation of contraction and relaxation in muscle and non-muscle cells.

We can move some muscles of our own will. Muscles present in our limbs can move at our will and stop when we so decide. Such muscles are called voluntary muscles. On the other hand, alimentary canal, iris of the eye, and bronchi of lungs has involuntary muscles.

17. Nervous tissue is not found in

(a) brain (b) spinal cord (c) tendons (d) nerves

Answer: (b) limbs

Explanation: Connective tissue that connects muscles to bones is tendons. They are fibrous in nature and give strength and limited flexibility.

18. Nerve cells does not contain

(a) axon (b) nerve endings (c) tendons (d) dendrites

Answer: (c) tendons

Explanation: Tendons are located between bone and muscles. Tendons are extremely strong and have high tensile strength. All the other options are nerve cell components.

19. Which of the following helps in the repair of tissue and fills up the space inside the organ?

(a) Tendon (b) Adipose tissue (c) Areolar (d) Cartilage

Answer: (c) Areolar

Explanation: Areolar connective tissue is found between the skin and muscles, around blood vessels and nerves, and in the bone marrow. It fills the space inside the organs, supports internal organs, and helps in the repair of tissues.

20. The muscular tissue which functions throughout the life continuously without fatigue is

(a) skeletal muscle (b) cardiac muscle

(c) smooth muscle (d) voluntary muscle

Answer: (b) cardiac muscle

Explanation: Cardiac muscles are involuntary striated muscles, found in the walls of the heart. Cardiac muscles contract and relax rapidly, endlessly, and rhythmically throughout a lifetime. These are highly resistant to fatigue due to the presence of an abundant number of mitochondria.

Other types of muscles are voluntary muscles and work when needed. They do not work constantly.

21. Which of the following cells is found in the cartilaginous tissue of the body?

(a) Mast cells (b) Basophils (c) Osteocytes (d) Chondrocytes

Answer: (d) Chondrocytes

Explanation: Cartilaginous tissues are made up of Chondrocytes. These are the cells that form cartilage. Mast cells are located in mucosal and epithelial tissues, basophils are white blood cells that develop in the bone marrow. Osteocytes are bone cells.

22. The dead element present in the phloem is

(a) companion cells (b) phloem fibres

(c) phloem parenchyma (d) sieve tubes

Answer: (b) phloem fibers

Explanation: Phloem fibers are the dead sclerenchymatous fibers and those are located in between the sieve tubes.

23. Which of the following does not lose its nucleus at maturity?

(a) Companion cells (b) Red blood cells

(c) Vessel (d) Sieve tube cells

Answer: (a) Companion cells

Explanation: RBC, Vessels, and sieve tube cells lose their nucleus at maturity, Companion cell does not.

24. In desert plants, the rate of water loss gets reduced due to the presence of

(a) cuticle (b) stomata (c) lignin (d) suberin

Answer: (a) cuticle

Explanation: The cuticle is the protective outermost covering of plant parts. It is present on leaves, fruits, flowers, and non-woody stems of higher plants. It insulates plants from heat and reduces the loss of water in xerophytes.

25. A long tree has several branches. The tissue that helps in the sideways conduction of water in the branches is

(a) collenchyma (b) xylem parenchyma

(c) parenchyma (d) xylem vessels

Answer: (d) xylem vessels

Explanation: Collenchyma tissues give mechanical support and elasticity to the plant.

Parenchyma reserves food and provides turgidity to plant parts/organs.

The xylem is a plant vascular tissue that carries out the function of transportation of water from the root to the tip.

26. If the tip of the sugarcane plant is removed from the field, even then it keeps on growing in length. It is due to the presence of

(a) cambium (b) apical meristem

(c) lateral meristem (d) intercalary meristem

Answer: (d) intercalary meristem

Explanation: Intercalary meristem is present in the nodes of sugarcane. It promotes the vertical growth of internodes and therefore sugarcane plants can still keep on growing even without the apical meristem that was removed while removing the tip.

27. A nail is inserted in the trunk of a tree at a height of 1 meter from the ground level. After 3 years the nail will

(a) move downwards (b) move upwards

(c) remain in the same position (d) move sideways

Answer: (c) remain in the same position

Explanation: Intercalary The apical meristem remains constant level and the longitudinal growth in the stem occurs at the top.

(c) The nail will remain at the same position after 3 years, but will appear to have sunk into the tree. This is because of the secondary growth of the tree which increases the girth of a tree. The increase in height of the plant will occur due to primary growth which occurs only in the regions of the apical meristems i.e. at the tips of the main stem or branches. As an increase in height of the tree takes place from top only, therefore the nail will remain at the same position as it is inserted near the ground level.

28. Parenchyma cells are

(a) relatively unspecified and thin-walled (b) thick-walled and specialized

(c) lignified (d) none of these

Parenchyma is the most common simple permanent tissue. It consists of relatively unspecialized cells with thin cell walls. They are living cells. They are usually loosely arranged, thus large spaces between cells (intercellular spaces) are found in this tissue.

Answer: (a) relatively unspecified and thin-walled.

Explanation: a) Parenchyma is a living, simple permanent tissue that consists of relatively unspecified cells with thin walls. The cells contain intercellular spaces. Parenchyma tissue stores food, nutrients, and water and performs many other functions.

29. Flexibility in plants is due to

(a) collenchyma (b) sclerenchyma (c) parenchyma (d) chlorenchyma

Answer: (a) collenchyma

Collenchyma tissues are made up of living cells. It has cellulose and cells thicken at the corners. Collenchyma provides flexibility and support. It allows bending in plant parts.

30. Cork cells are made impervious to water and gases by the presence of

(a) cellulose (b) lipids (c) suberin (d) lignin

Answer: (c) suberin

Explanation: The cells in the cork are dead cells. They do not have intercellular spaces. Suberin is found in the Phylum layer of the periderm. It is the main constituent of cork and it functions as a barrier to water and other solute movements.

31. Survival of plants in the terrestrial environment has been made possible by the presence of

(a) intercalary meristem (b) conducting tissue

(c) apical meristem (d) parenchymatous tissue

Answer: (b) conducting tissue

Explanation: conductive tissue i.e. Xylem performs the function of transporting water and mineral elements from root to top. Water absorption and conduction (transportation) are crucial for a plant to survive in terrestrial habitat.

32. Choose the wrong statement

(a) The nature of the matrix differs according to the function of the tissue

(b) Fats are stored below the skin and in between the internal organs

(c) Epithelial tissues have intercellular spaces between them

(d) Cells of striated muscles are multinucleate and unbranched

Answer: (c) Epithelial tissues have intercellular spaces between them

Epithelial tissues are compactly packed and have no intercellular spaces between them. They form a continuous, protective covering on most of the internal and external surfaces of the body.

33. The water-conducting tissue generally present in gymnosperm is

(a) vessels (b) sieve tube

(c) tracheids (d) xylem fibers

Answer: (c) tracheids

In gymnosperms vessels are absent. Sieve tubes are conducting structures in phloem hence they do not take part in water transport. Xylem fibres are absent in gymnosperms.

Short Answer Questions

34. Animals of colder regions and fishes of cold water have a thicker layer of subcutaneous fat. Describe why?

Answer: The subcutaneous layers also known as adipose tissues are present below the skin and in between internal organs. It helps the body to trap heat to retain body temperature. The fat layer works as an insulator for thermoregulation. For this reason, animals from colder regions and cold water fishes have several layers of fat.

35. Match column (A) with column (B)

Column (A)	Column (B)
(a) Fluid connective tissue	(i) Subcutaneous layer
(b) Filling of space inside the organ	(ii) Cartilage
(c) Striated muscle	(iii) Skeletal muscle
(d) Adipose tissue	(iv) Tissue

(e) Surface of joint	(v) Blood
(f) Stratified squamous epithelium	(vi) Skin

Answer: a—(v); b—(iv); c—(iii); d—(i); e—(ii); f—(vi);

36. Match column (A) with column (B)

Column A	Column B
(a) Parenchyma	(i) Thin-walled packing cells
(b) Photosynthesis	(ii) Carbon fixation
(c) Aerenchyma	(iii) Localized thickening
(d) Collenchyma	(iv) Buoyancy
(e) Permanent tissue	(v) Sclerenchyma

Answer: a—(i); b—(ii); c—(iv); d—(iii); e—(v);

37. If a potted plant is covered with a glass jar, water vapors appear on the wall of the glass jar. Explain why?

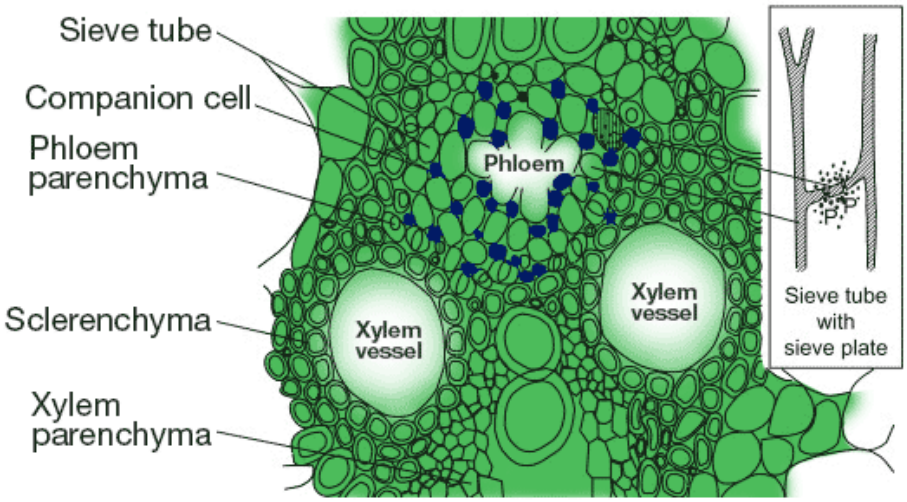
Answer: If a potted plant is covered with a glass jar, water vapors appear on the wall of the glass jar due to the process of transpiration.

Transpiration is a process in which water evaporates in the form of vapors through stomata that are present on a plant's stems and leaves.

During transpiration water comes out of leaves in the form of vapours. Due to the cover condensed water vapour can not get out and hence it appears on the glass jars walls.

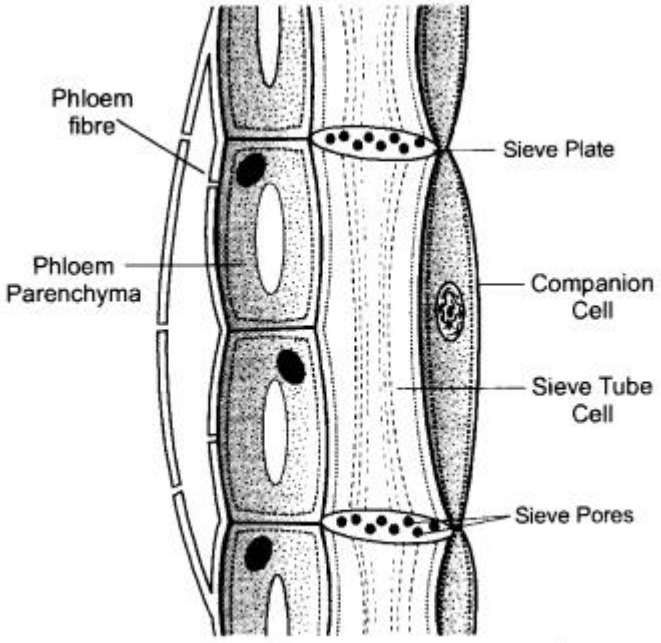
38. Name the different components of the xylem and draw a living component.

Answer: The xylem comprises tracheids, vessels, xylem parenchyma and xylem fibres. The only living component of xylem is xylem parenchyma.



39. Draw and identify different elements of phloem.

Answer: Sieve tubes, companion cells, phloem fibers, and phloem parenchyma.



40. Write true (T) or false (F)

(a) Epithelial tissue is protective tissue in the animal body.

(b) The lining of blood vessels, lung alveoli, and kidney tubules are all made up of epithelial tissue.

(c) Epithelial cells have a lot of intercellular spaces.

(d) The epithelial layer is a permeable layer.

(e) The epithelial layer does not allow the regulation of materials between the body and the external environment.

Answer: (a)—T, (b)—T, (c)—F, (d) —T, (e)—F

Voluntary muscles	Involuntary muscles
They are also called striated muscles since they show stripes or striations	They are also called non-striated muscles since they lack striations.
Their cells are long and cylindrical	Their cells are small and spindle-shaped.
They have multinucleate cells	They have uninucleate cells
They are under our will or control.	They are not under our will or control.
They get tired and need rest at intervals.	They can work continuously without getting tired
Example: Skeletal muscle, Limb muscle	Example: Smooth muscle, Cardiac muscle

42. Differentiate the following activities on the basis of voluntary (V) or involuntary (I V) muscles.

(a) Jumping of frog

(b) Pumping of the heart

(c) Writing with hand

(d) Movement of chocolate in your intestine

Answer: Answer: (a)—V, (b)—IV, (c)—V, (d) —IV

(a) Jumping of frog – is an activity of voluntary muscles

(b) Pumping of the heart- is a function of involuntary muscles

(c) Writing with hand- is a function of voluntary muscles

(d) Movement of chocolate in your intestine- is a function of involuntary muscles

43. Fill in the blanks

(a) The lining of blood vessels is made up of _____.

Answer: squamous epithelium

(b) Lining of the small intestine is made up of _____.

Answer: columnar epithelium

(c) Lining of kidney tubules is made up of _____.

Answer: cuboidal epithelium

(d) Epithelial cells with cilia are found in _____ of our body.

Answer: respiratory tract

44. Water hyacinth floats on the water surface. Explain.

Answer: Water hyacinth can float on water due to the presence of a special type of parenchymatous tissue called aerenchyma. This tissue has large air-filled spaces that provide buoyancy to the water hyacinth plant and therefore, the plant can easily float on the water surface.

45. Which structure protects the plant body against the invasion of parasites?

Answer: The epidermis is a layer of parenchymatous cells that forms the outermost covering of the plant body. The epidermis consists of compactly arranged cells without any intercellular spaces. On the aerial plant parts, it secretes a thick, waxy, water-resistant layer called a cuticle on its outer surface. These features make the epidermis protective against loss of water, mechanical injury, and the invasion of parasites.

46. Fill in the blanks

(a) Cork cells possess _____ on their walls that makes them impervious to gases and water.

Answer: suberin

(b) _____ have tubular cells with perforated walls and are living in nature.

Answer: sieve tubes

(c) Bone possesses a hard matrix composed of _____ and _____.

Answer: calcium and phosphorus

47. Why is the epidermis important for plants?

Answer: Epidermis is important for plants because :

(i) it protects organs from the external environment.

(ii) protective covering against mechanical injury.

(iii) reduces water loss.

(iv) increases water absorption with the help of root hairs arising from the epidermis.

48. Fill in the blanks

(a) _____ are forms of complex tissue.

Answer: Xylem and phloem

(b) _____ have guard cells.

Answer: Stomata

(c) Cells of cork contain a chemical called _____.

Answer: Suberin

(d) Husk of coconut is made of _____ tissue.

Answer: Sclerenchyma

(e) _____ gives flexibility in plants.

Answer: Collenchyma

(f) _____ and _____ are both conducting tissues.

Answer: Xylem; phloem

(g) Xylem transports _____ and _____ from soil.

Answer: Water; minerals

(h) Phloem transport _____ from _____ to other parts of the plant.

Answer: food; leaves

Long Answer Questions

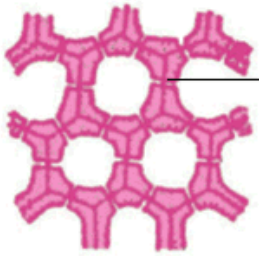
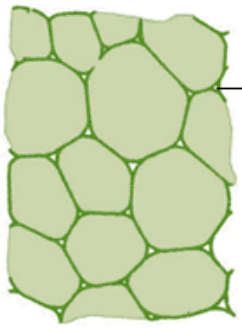
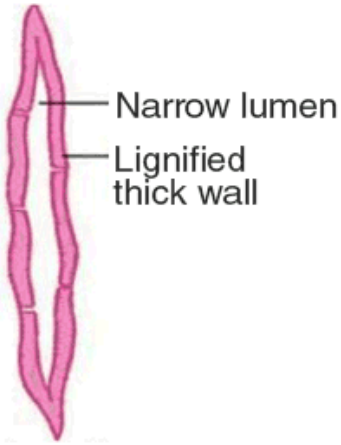
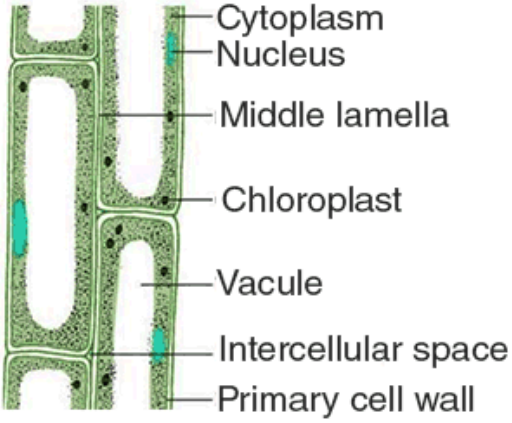
49. Differentiate between sclerenchyma and parenchyma tissues. Draw a well-labeled diagram.

Answer:

Answer: The difference between parenchyma and sclerenchyma tissues:

Parenchyma	Sclerenchyma
(1) Parenchyma tissues consist of living cells.	(1) Sclerenchyma is composed of dead cells.
(2) Cell walls are thin and unspecialized	(2) Cell walls are uniformly thick and lignified

(3) Parenchymatous cells carry out the process of photosynthesis, serve as a packing tissue, and as a food storage tissue.	(3) Sclerenchymatous cells provide strength and rigidity to the plant body.
(4) Cells have extensive central vacuole and prominent nuclei.	(4) Cells lack nucleus and cytoplasm
(5) Present in the root cortex, mesophyll of leaves, etc.	(5) Present in the root, leaf veins, seed coverings, etc.

Sclerenchyma tissue	Parenchyma tissue
 Transverse section	 Transverse section
 Longitudinal section	 Longitudinal section

50. Describe the structure and function of different types of epithelial tissues. Draw diagrams of each type of epithelial tissue.

Answer: The human body consists of four types of tissue: epithelial, connective, muscular, and nervous. Epithelial tissues are thin and cover all the exposed surfaces of our body, and keep different body systems separate. Epithelial tissues form the skin, the inner lining of the mouth, digestive tract, the lining of blood vessels, lung alveoli, and kidney tubules, the lining of hollow parts of every organ such as the heart, lungs, eyes, ears, the ventricular system of the brain, central canals of the spinal cord are all made of epithelial tissue.

Epithelial tissue cells are closely bound to one another with only a small amount of cementing material between them and almost no intercellular spaces.

They perform several functions such as protection from the invasion of various pathogens, radiation damage, abrasion, excretion, filtration, diffusion, etc. The permeability of the cells of various epithelia plays a part in regulating the exchange of materials between the body and the external environment and also between different parts of the body.

Different types of epithelial tissues are as follows:

(1) Simple squamous epithelium

(2) Stratified squamous epithelium

(3) Columnar epithelium, and

(4) Cuboidal epithelium.

(1) Simple squamous epithelium

These are simple, thin, single-layered, delicate, and flat types of cells. Simple squamous epithelial cells are selectively permeable, form lining blood vessels, alveoli and lungs i.e. where transportation of substances takes place. Simple squamous epithelial cells also form the lining of the esophagus, the skin, and the mouth.

(2) Stratified squamous epithelium

These are multilayered, cells from multiple layers. Skin is made up of these issues. Stratified squamous cells are compactly placed in order to avoid wear and tear of the skin cells.

(3) Columnar epithelium

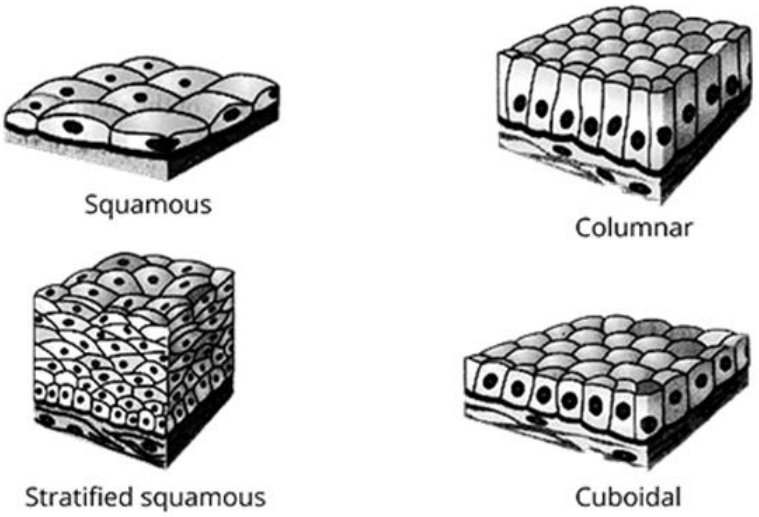
These cells are longitudinal, pillar-like, and have outstretched nuclei. These cells are found where absorption and secretion occur, such as in the intestine's inner lining.

Ciliated Columnar epithelium: Hair-like projections are found on the external surface of the epithelial cells, these projections are called cilia. These cilia are capable of movement and their movement pushes the substance forward. The ciliated columnar epithelium is found on the lining of the oviduct, lining of the trachea, the kidney, etc.

(4) Cuboidal epithelium

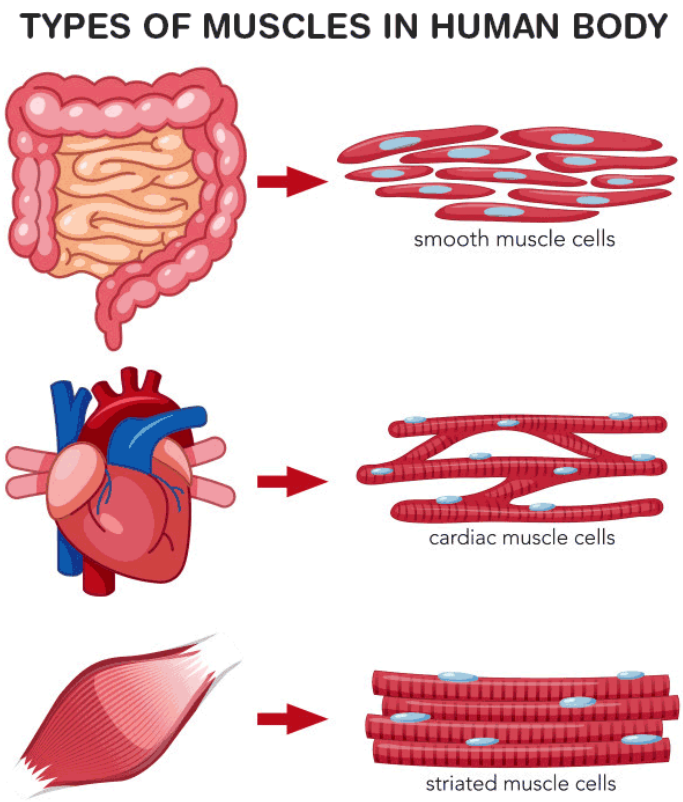
These cells are cuboidal (cube-like) in shape. Cuboidal epithelial cells provide mechanical support and form the lining of kidney tubules. These cells also form the lining of salivary glands.

Glandular Epithelium: Epithelial cells often evolve into gland cells. The glandular epithelium is found in tear and sweat glands. They perform the function of secretion.



51. Draw well labelled diagrams of various types of muscles found in human body.

Answer:



52. Give reasons for

(a) Meristematic cells have a prominent nucleus and dense cytoplasm but they lack vacuole.

Answer: Meristematic cells have prominent nuclei and dense cytoplasm, they continue diving throughout their lifetime. Meristematic cells divide constantly and give rise to new cells hence they do not need to maintain a definite shape and store food or accumulate waste material. Therefore, vacuoles are absent in meristematic cells.

(b) Intercellular spaces are absent in sclerenchymatous tissues.

Answer: Intercellular spaces are absent in sclerenchymatous tissues because they have lignified cell walls. They are organized closely and are meant to provide strength and protection to the plant parts.

(c) We feel crunchy and granular when we chew pear fruit.

Answer: Sclerenchymatous tissues are present in pear fruit. They are small, thickened and hard due to the presence of lignin. As a result, we get a crunchy and granular feeling when we chew pear fruit.

(d) Branches of a tree move and bend freely in high wind velocity.

Answer: Branches of a tree bend freely in high wind velocity due to the presence of collenchyma. Collenchyma is present at the junction of branches. It provides rigidity with flexibility.

(e) It is difficult to pull out the husk of a coconut tree.

Answer: The husk of a coconut tree is made up of sclerenchymatous tissues. Sclerenchyma cells are lignified and are packed densely for the protection of the plant. Hence, it is difficult to pull out the husk of a coconut tree.

53. List the characteristics of cork. How are they formed? Mention their role.

Answer: a) Characteristics of cork are as follows:

1. It is an outer protective tissue layer of the oldest stem.
2. Cork cells are dead at maturity.
3. Cells are compactly arranged and cells do not have intercellular spaces.
4. A chemical substance called Suberin is present in their cell walls.
5. Cells are thick and made up of several layers

b) At maturity, the secondary meristem replaces the epidermis of the stem. Cells that are cut on the outer side by this meristem are then called cork.

c) The Main function is to provide protection to older stem/twigs/branches and prevent water loss. The tick material is impervious to water and works as an insulator.

54. Why are the xylem and phloem called complex tissues? How are they different from one another?

Answer: A tissue made up of more than one or more types of cells and they work together as a unit is known as Complex tissue. Both xylem and phloem are made up of more than one type of cell and that's why they are known as complex tissues.

Xylem	Phloem
Transport of water and minerals by xylem is unidirectional.	Transport of food material by phloem is bidirectional.
Xylem elements are tracheids, vessels, xylem parenchyma, and xylem fibers.	Phloem elements are sieve tubes, companion cells, phloem parenchyma, and phloem fibers.
It gives mechanical strength to the plant.	It does not provide mechanical strength to the plant.

55. (a) Differentiate between meristematic and permanent tissues in plants.

Answers:

Meristematic Tissue	Permanent Tissue
Cells of this tissue are living small, Spherical, and undifferentiated.	Cells of this tissue may be living or dead, of various shapes, large and differentiated.
Cells are capable of division throughout their lifetime	Cells take up a specific function and lose their ability to divide
Intercellular spaces are absent	Intercellular spaces are absent
Meristematic tissues are found in specific regions of the plant i.e. Apical, Lateral, Intercalary	Permanent tissues are located beneath the epidermis and spread throughout the plant body

Its cells grow and divide regularly.	Its cells do not normally divide.
It provides growth to the plant.	It provides protection. Support, conduction photosynthesis, storage, etc.
It is a simple tissue.	It can be simple, complex or specialized,
The cytoplasm is dense and vacuoles are nearly absent as they are metabolically active.	Large central vacuole occurs in living permanent cells as, they are less metabolically active.

(b) Define the process of differentiation.

Answer: Differentiation is a process in which the cell loses its ability to divide and takes up a permanent shape, size, and function. Young cells evolve to become specialized cells and develop into tissues and organs with the help of differentiation.

(c) Name any two simple and two complex permanent tissues in plants.

Answer: (i)The two simple tissues in plants are: Parenchyma/collenchyma/sclerenchyma.

(ii) The two complex tissues in plants are the xylem/phloem.