Tissue

Multiple Choice Questions

1. Which of the following tissues has dead cells?
(a) Parenchyma
(b) Sclerenchyma
(c) Collenchyma
(d) Epithelial tissue
Ans. (b) Sclerenchyma
Explanation: Sclerenchyma is entirely composed of dead cells. Tissues in others options are composed of live cells only.

2. Find out 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
Ans. (c) Apical and intercalary meristems are permanent tissues
Explanation: Meristematic tissues are not permanent tissues and hence option 'c' is incorrect statement.

3. Girth of stem increases due to
(a) apical meristem
(b) lateral meristem
(c) intercalary meristem
(d) vertical meristem
Ans. (b) lateral meristem
Explanation: Other meristems in options facilities growth in length, while lateral meristem facilities growth in girth.

4. Which cell does not have perforated cell wall?
(a) Tracheids
(b) Companion cells
(c) Sieve tubes
(d) Vessels
Ans. (b) Companion cells
Explanation: Perforated cell walls in cells (options a, c and d) are necessary to make channels for transport of water. Moreover, companion cells are live cells and hence do not have perforated cell wall.

5. 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

Ans. **(b)** Columnar epithelium
Explanation: Epithelium in option 'a' is present in skin and that in option 'd' is meant for structural support. Columnar epithelium facilities absorption. Tissue in option 'c' is not a type of epithelium.

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

Ans. **(c)** Ligament break
Explanation: Ligaments join a bone to another bone and hence ligament break can result in 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

Ans. **(d)** Skeletal muscles contract and pull the tendon to move the bones
Explanation: Skeletal muscles are responsible for voluntary movement and hence movement in hand is facilitated by contraction or relaxation in skeletal muscles. A tendon joins a bone to a muscle; so, option 'd' is correct.

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)

Ans. **(b)** (ii) and (iii)
Explanation: Skeletal muscles are voluntary. They are also striated. Smooth muscles and cardiac muscles are involuntary.

9. Meristematic tissues in plants are
(a) localised and permanent
(b) not limited to certain regions
(c) localised and dividing cells

(d) growing in volume

Ans. **(c)** localised and dividing cells
Explanation: Cells of meristematic tissue are dividing cells. Meristematic tissue is present only in those parts which needs to grow.

10. Which is not a function of epidermis?
(a) Protection from adverse condition
(b) Gaseous exchange
(c) Conduction of water
(d) Transpiration

Ans. (c) Conduction of water
Explanation: Conduction of water is a function of xylem and not of epidermis.

11. Select the incorrect sentence
(a) Blood has 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

Ans. **(c)** Tendons are non-fibrous tissue and fragile
Explanation: Tendons are fibrous tissue and are highly elastic and strong.

12. Cartilage is not found in
(a) nose
(b) ear
(c) kidney
(d) larynx

Ans. **(c)** kidney
Explanation: Kidney is composed of different kinds of epithelial tissues.

13. Fats are stored in human body as
(a) cuboidal epithelium
(b) adipose tissue
(c) bones
(d) cartilage

Ans. **(b)** adipose tissue
Explanation: Another name of adipose tissue is fat tissue.

14. Bone matrix is rich in
(a) fluoride and calcium
(b) calcium and phosphorus
(c) calcium and potassium
(d) phosphorus and potassium

Ans. **(b)** calcium and phosphorus
Explanation: Bone cells are embedded in a hard matrix which is composed of calcium and phosphorus.

15. Contractile proteins are found in

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

Ans. (c) muscles

Explanation: Muscles have the ability of contraction and hence contractile proteins are found in them.

16. Voluntary muscles are found in

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

Ans. (b) limbs

Explanation: movement of organs in other options is not under our conscious control. Hence, voluntary muscles are not found in them.

17. Nervous tissue is not found in

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

Ans. (c) tendons

18. Nerve cell does not contain

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

Ans. (c) tendons

Explanation: Tendon is a type of connective tissue, while nerve cells compose the nervous tissue.

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

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

Ans. (c) Areolar

Explanation: Areolar tissue fills the space inside the organ, supports internal organs and helps in repair of tissue.

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

(a) skeletal muscle
(b) cardiac muscle
(c) smooth muscle
(d) voluntary muscle

Ans. (b) cardiac muscle

Explanation: This is the reason; our heart keeps on pumping the blood throughout the life. Other types of muscles work as and when required because they do not need to work continuously.

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

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

Ans. (d) Chondrocytes

Explanation: Mast cells are found in areolar tissue, basophils are found in blood and osteocytes are found in bone.

22. The dead element present in the phloem is

(a) companion cells
(b) phloem fibres
(c) phloem parenchyma
(d) sieve tubes

Ans. (b) phloem fibres

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

(a) Companion cells
(b) Red blood cells
(c) Vessel
(d) Sieve tube cells

Ans. (a) Companion cells

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

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

Ans. (a) cuticle

Explanation: Cuticle works as protective layer to minimize the effect of heat. Thus, cuticle helps in reducing water loss in desert plants.

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

Ans. **(d)** xylem vessels
Explanation: Collenchyma has no role in transport of water. Parenchyma is a supportive tissue and has nothing to do with conduction of water.

26. If the tip of 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

Ans. **(d)** intercalary meristem
Explanation: Intercalary meristem facilities the longitudinal growth of internode and thus a sugarcane plant keeps on growing even in the absence of apical meristem.

27. A nail is inserted in the trunk of a tree at a height of 1 metre from the ground level. After 3 years the nail will
(a) move downwards
(b) move upwards
(c) remain at the same position
(d) move sideways

Ans. **(c)** remain at the same position
Explanation: Longitudinal growth in stem takes place at the top. So, portion below the apical meristem will remain at a constant level even after growth.

28. Parenchyma cells are
(a) relatively unspecified and thin walled
(b) thick walled and specialised
(c) lignified
(d) none of these

Ans. **(a)** relatively unspecified and thin walled
Explanation: Parenchyma is simplest among simple tissues. Hence, cells are thin-walled and relatively unspecified.

29. Flexibility in plants is due to
(a) collenchyma
(b) sclerenchyma
(c) parenchyma
(d) chlorenchyma

Ans. **(a)** collenchyma
Explanation: Collenchyma provides rigidity with some flexibility. This is possible because of thickening of cells at corners.

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

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

Ans. (c) suberin

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

(a) intercalary meristem
(b) conducting tissue
(c) apical meristem
(d) parenchymatous tissue

Ans. (b) conducting tissue

Explanation: It is because of conducing tissues that plants are able to take up water from soil. Thus, plants could be able to survive in terrestrial environment where availability of water can be a major issue.

32. Choose the wrong statement

(a) The nature of 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

Ans. (c) Epithelial tissues have intercellular spaces between them

Explanation: Epithelial tissues do not have intercellular spaces between them, rather cells are tightly fit together to make a continuous sheet.

33. The water conducting tissue generally present in gymnosperm is

(a) vessels
(b) sieve tube
(c) tracheids
(d) xylem fibres

Ans. (c) tracheids

Explanation: Sieve tubes are present in phloem and hence have no role in transport of water. Xylem fibres provides structural rigidity and have no role in conduction of water. Vessels are generally absent in gymnosperms.

Tissue

Short Answer Questions

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

Ans. Fat acts as subcutaneous insulation of body for thermoregulation.

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

Column (A)	Column (B)
(a) Fluid connective tissue	(i) Subcutaneous layer
(b) Filling of space inside the organs	(ii) Cartilage
(c) Striated muscle	(iii) Skeletal muscle
(d) Adipose tissue	(iv) Areolar tissue
(e) Surface of joints	(v) Blood
(f) Stratified squamous epithelium	(vi) Skin

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

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

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

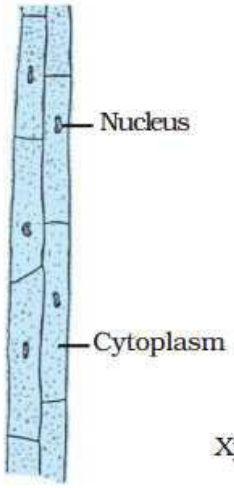
Ans. a—(i); b—(ii); c—(iv); d—(iii); e—(v);

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

Ans. Transpiration takes place through stomata. Water vapour comes out of leaves during transpiration. When a potted plant is covered with a glass jar, water vapour (coming out becomes of transpiration) condenses on the wall of glass jar and hence it appears as fine droplets.

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

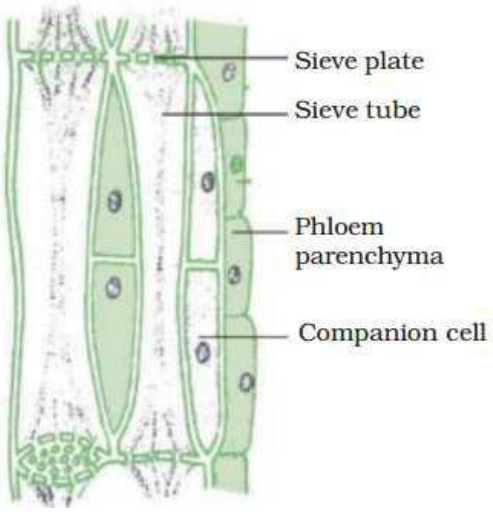
Ans. Xylem consists of tracheids, vessels, xylem parenchyma and xylem fibres.



Xylem parenchyma

39. Draw and identify different elements of phloem.

Ans. Sieve tubes, companion cells, phloem fibres and phloem parenchyma.



Section of phloem

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

(a) Epithelial tissue is protective tissue in 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) Epithelial layer is permeable layer.
(e) Epithelial layer does not allow regulation of materials between body and external environment.

Ans. (a)—T, (b)—T, (c)—F, (d) —T, (e)—F

41. Differentiate between voluntary and involuntary muscles. Give one example of each type.

Ans.

Voluntary muscles	Involuntary muscles
(i) Their action is under our conscious control.	(i) Their action is not under our conscious control.
(ii) Cells are multinucleate.	(ii) Cells are uninucleate.
(iii) Example: Skeletal muscles	(iii) Example: Smooth 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
Ans. (a)—V, (b)—IV, (c)—V, (d) —IV

43. Fill in the blanks
(a) Lining of blood vessels is made up of _____.
Ans. squamous epithelium
(b) Lining of small intestine is made up of _____.
Ans. columnar epithelium
(c) Lining of kidney tubules is made up of _____.
Ans. cuboidal epithelium
(d) Epithelial cells with cilia are found in _____ of our body.
Ans. respiratory tract

44. Water hyacinth float on water surface. Explain.
Ans. A special type of parenchyma; called aernchyma is present in water hyacinth. This tissue has air-filled spaces inside. Due to this, water hyacinth floats on water surface.

45. Which structure protects the plant body against the invasion of parasites?
Ans. Epidermis having thick cuticle and waxy substances to prevent the invasion of parasites.

46. Fill in the blanks
(a) Cork cells possesses _____ on their walls that makes it impervious to gases and water.
Ans. suberin
(b) _____ have tubular cells with perforated walls and are living in nature.
Ans. sieve tubes
(c) Bone possesses a hard matrix composed of _____ and _____.
Ans. calcium and phosphorus

47. Why is epidermis important for the plants?
Ans. Epidermis is important for plants due to the following reasons
(i) it gives protection

(ii) helps in gaseous exchange
(iii) checks water loss
(iv) root hairs arising from epidermis helps in absorption of water and minerals.

48. Fill in the blanks

(a) _____ are forms of complex tissue.
Ans. Xylem and phloem
(b) _____ have guard cells.
Ans. Stomata
(c) Cells of cork contain a chemical called _____.
Ans. Suberin
(d) Husk of coconut is made of _____ tissue.
Ans. Sclerenchyma
(e) _____ gives flexibility in plants.
Ans. Collenchyma
(f) _____ and _____ are both conducting tissues.
Ans. Xylem; phloem
(g) Xylem transports _____ and _____ from soil.
Ans. Water; minerals
(h) Phloem transport _____ from _____ to other parts of the plant.
Ans. food; leaf

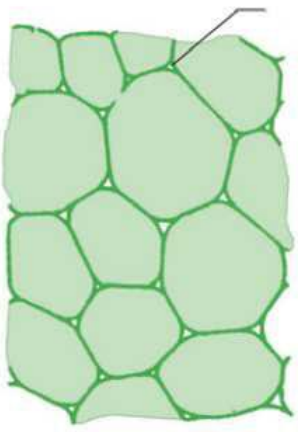
Tissue

Long Answer Questions

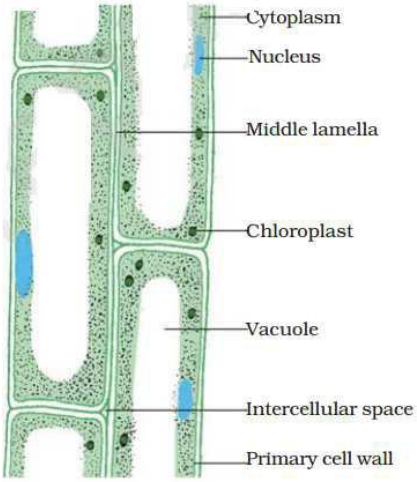
49. Differentiate between sclerenchyma and parenchyma tissues. Draw well labelled diagram.

Ans.

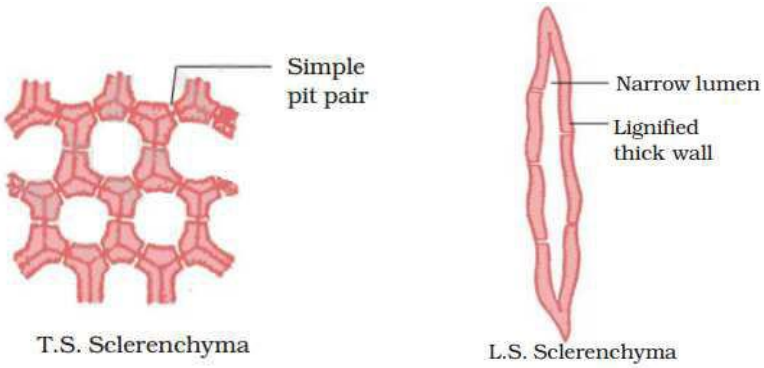
Parenchyma	Sclerenchyma
(1) Cells are thin walled and unspecialized.	(1) Cells are thick walled and lignified.
(2) These are living cells.	(2) Tissues are made up of dead cells.
(3) Cells are usually loosely packed with large intercellular space.	(3) No intercellular spaces between the cells are found.
(4) Stores nutrient and water in stem and roots.	(4) Provides strength to the plant parts.
(5) Some cells contain chlorophyll called chlorenchyma and perform photosynthesis. Other cells have large air cavities called aerenchyma which provide buoyancy to the hydrophytic plants.	(5) The cells are long and narrow, make the plant hard and stiff. The tissue is present in the stem around vascular bundles, in veines of leaves and hard covering of seeds and nuts.



T.S. Parenchyma



L.S. Parenchyma



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

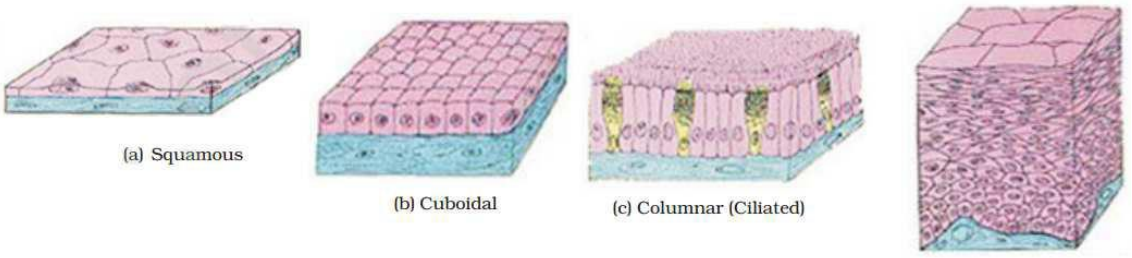
Ans. Epithelial tissues are the covering or protective tissues in the animal body. Epithelium covers most organs and cavities within the body and keep different body systems separate. The skin, the lining of the mouth, the lining of blood vessels, lung alveoli and kidney tubules are all made of epithelial tissue. Epithelial tissue cells are tightly packed and form a continuous sheet. They have only a small amount of cementing material between them and almost no intercellular spaces. The permeability of the cells of various epithelia play an important role in regulating the exchange of materials between the body and the external environment and also between different parts of the body. Regardless of the type, all epithelia are usually separated from the underlying tissue by an extracellular fibrous basement membrane.

Epithelial tissues are of following types— (1) Simple squamous epithelium (2) Stratified squamous epithelium (3) Columnar epithelium, and (4) Cubodial epithelium. These tissues differ in structure that correlate with their unique functions. For example, in cells lining blood vessels or lung alveoli, where transportation of substances occurs through a selectively permeable surface, there is a simple flat kind of epithelium. This is called the simple squamous epithelium. Simple squamous epithelial cells are extremely thin and flat and form a delicate lining. The skin, oesophagus and the lining of the mouth are also covered with squamous epithelium.

Skin epithelial cells are arranged in many layers to prevent wear and tear. Since, they are arranged in a pattern of layers, the epithelium is called stratified squamous epithelium.

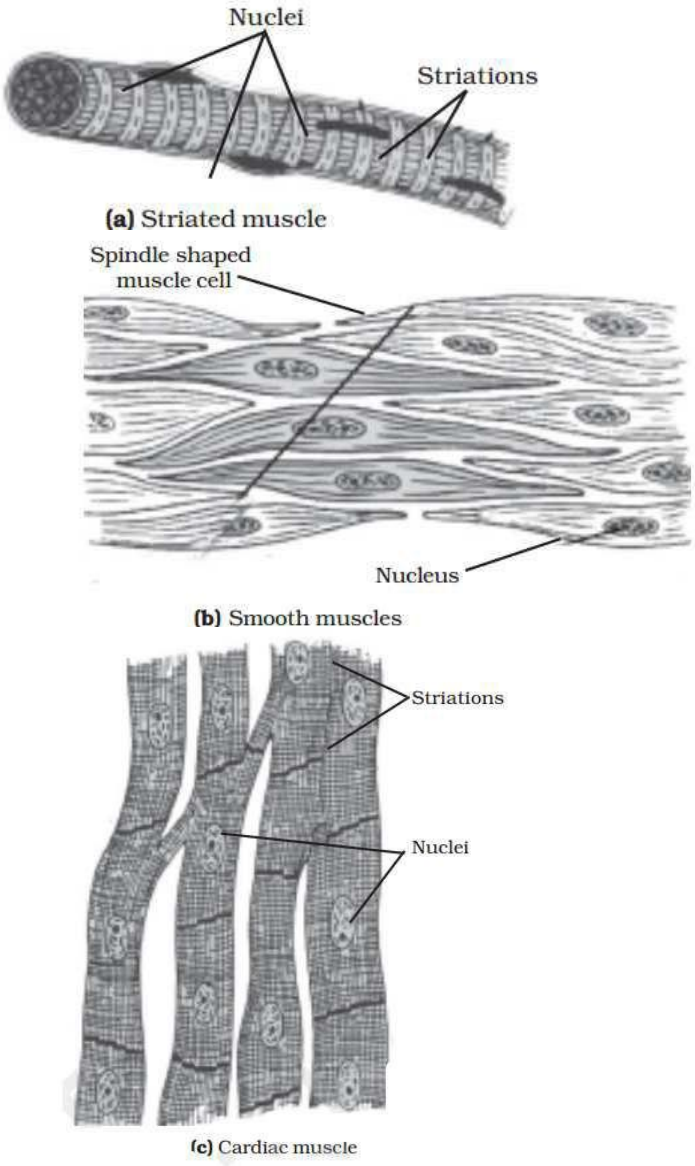
Where absorption and secretion occur, as in the inner lining of the intestine, tall epithelial cells are present. This columnar epithelium facilitates movement across the epithelial barrier. In the respiratory tract, the columnar epithelial tissue also has cilia, which are hair-like projections on the outer surfaces of epithelial cells. These cilia can move, and their movement pushes the mucus forward to clear it. This type of epithelium is thus ciliated columnar epithelium.

Cuboidal epithelium forms the lining of kidney tubules and ducts of salivary glands, where it provides mechanical support. Epithelial cells often acquire additional specialisation as gland cells, which can secrete substances at the epithelial surface. Sometimes a portion of the epithelial tissue folds inward, and a multicellular gland is formed. This is glandular epithelium.



Different types of epithelial tissues

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



52. Give reasons for

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

Ans. Cells of meristematic tissue are capable of division. Hence, prominent nucleus and dense cytoplasm are present in these cells. Since these cells continuously undergo division hence they do not need to maintain a particular shape and store food. Due to this, vacuoles are not required in these cells.

(b) Intercellular spaces are absent in sclerenchymatous tissues.

Ans. Cell wall in sclerenchyma is lignified. Due to this, intercellular spaces are absent in sclerenchymatous tissues.

(c) We get a crunchy and granular feeling, when we chew pear fruit.

Ans. In a pear fruit, cells of scelerenhyma are small and called stone cells. We get the crunchy feeling due to these stone cells.

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

Ans. Collenchyma is present at junction of a branch. Collenchyma provides rigidity with flexibility. Due to this, branches of tree move and bend freely in high wind velocity.

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

Ans. The husk of coconut tree is composed of sclerenhyma. Due this, the husk is very hard and is difficult to be pulled out.

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

Ans. Characteristics

a)

- Cells of cork are dead at maturity
- These cells are compactly arranged
- Cells do not possess intercellular spaces.
- Cells possess a chemical substances suberin in their walls
- They are several layers thick.

b) As plants grow older, a strip of secondary meristem replaces the epidermis of the stem. Cells cut on the outer side by this meristem are called cork.

c) They are protective in function for older stem/twigs/branches. They are impervious to gases and water.

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

Ans. Both xylem and phloem consist of more than one type of cells, which coordinate to perform a common function.

Xylem	Phloem
Consists of tracheids, vessels, xylem, parenchyma and xylem fibres.	Consist of sieve tubes, companion cell, phloem parenchyma and phloem fibres.
They transport water and minerals vertically from soil to aerial parts of the plant.	They transport food from leaves to other parts of the plant.
Most of the cells except xylem parenchyma are dead cells	Most of the cells except phloem fibres are living cells.

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

Meristematic	**Permanent**
Cells of this tissue divide throughout their life.	They lose the ability to divide to take up specific function.
They are located at specific regions of the plant viz: apical lateral, intercalary.	They are distributed throughout the plant body.
Cells of this tissue are very active, have dense cytoplasm, thin walls and prominent nuclei. They lack vacuoles.	They are vacuolated, vary in shape and size. Their cell wall may be thick.
Cell wall is cellulosic.	Cell wall is made up of cellulose/ lignin/ suberin.

(b) Define the process of differentiation.
Ans. The loss of ability to divide by taking up a permanent shape, size and function is called differentiation.
(c) Name any two simple and two complex permanent tissues in plants.
Ans. Simple: Parenchyma/collenchyma/sclerenchyma
Complex: Phloem/xylem**.**