

Sardar kaurey khan public higher secondary school M.garh

- Class 9th
- Subject biology
- syllabus for June
- Chapter 4
- Cells and tissues
- **Important MCQS**

1 The use of microscope is known as

(a)photography (b) endoscopy (c)microscopy (d)micrograph

2 Two first microscope was made in

(a)1995 (b)1895 (c)1595(d) 1685

3 Resolution power of human eye

(a)0.1mm (b)0.01 mm (c) 10 mm(d)10nm

4 A light microscope can magnify objects

(a)2500 x(b) 1500 x (c)1000 x (d)2000 x

5 The photograph taken by microscope is called

(a)Photograph (b) micrograph (c)cardiograph(d) Monograph

6 Magnification of light microscope is

(a)1300 X (b)1400 (c)1500 x (d)1600

7 In 1 millimetermicrometers are

(a)10 (b)100 (c)1000(d) 1/1000

8The resolution of modern electron microscope is

(a)0.2 nm(b) 0.3 nm(c)0.1 mm (d)0.12 nm

9 Robert Hooke use microscope to examine chock in

(a)9958(b) 1665(c) 1560(d) 1470

10 In 1831 _____ discovered nucleus in the cell

(a)Robert brown(b) Robert Hooke(c)Louis Pasteur(d)Laveran

11 Robert Hooke was a scientist

(a)Greek(b)Iranian(c)polish(d) British

12 In 1665 a British scientist first of all discovered cell

(a)Robert brown (b)RobertHooke(c)Aristotle(d) Lamarck

13 Cells were first discovered by

(a)Aristotle (b)Robert brown (c)Robert hook(d) Schwan

14 Nucleus is discovered in plant cell

(a)1930 (b) 1931(c) 1731 (d)1831

15 All cells are formed from preexisting cells is the saying of (a)Rudolf Virchow(b) Pasteur (c)Robert Hooke(d)Darwin

16In the cell wall of plants the chemical present is

(a)Cellulose(b)chitin(c) lignin (d)none of these

17 Cell wall of fungi has

(a)Protein (b)chitin(c) cellulose (d)fats

18 Cell wall is found in all organisms excepts

(a)Plants(b) animals (c)bacteria (d)fungi

19 The major component of plant cell wall is

(a)Chitin(b) cellulose (c)cholesterol(d) peptidoglycan

20 The chemical substance found in large quantity in wood is

(a)Cotton(b) leggings (c)albumin (d)globulin

21 The cell wall of prokaryotes is composed of

(a)peptidoglycan(b) cellulose (c)peptidoglycan(d) chitin

22 Cell membrane is mainly composed of

(a)Lignin(b) proteins and lipids (c)cholesterol (d)peptidoglycan

- 23 Fluid mosaic model explains the structure of
(a) Cell wall (b) cell membrane (c) nucleus (d) ribosome
- 24 Which is not present in cell membrane structure
(a) Lipids (b) carbohydrates (c) proteins (d) DNA
- 25 It is not component of plasma membrane
(a) Lipids (b) carbohydrates (c) proteins (d) DNA
- 26 Which is not present in cell membrane
(a) DNA (b) lipids (c) proteins (d) carbohydrates
- 27 Microfilaments are made up of
(a) Tubulin (b) tropomyosin (c) myosin (d) actin
- 28 Ribosomal RNA is produced in
(a) Mitochondria (b) nucleolus (c) lysosomes (d) Golgi apparatus
- 29 Ribosomes are constructed in
(a) Endoplasmic reticulum (b) nucleoid (c) nucleus (d) nuclear pore
- 30 fluid of chloroplast is called
(a) cytoplasm (b) cytosol (c) stroma (d) nucleoplasm
- 31 Rough endoplasmic reticulum serves a function in the synthesis of
(a) carbohydrates (b) protein (c) lipids (d) vitamins
- 32 Golgi was awarded Nobel prize in
(A) 1908 (b) 1807 (c) 1906 (d) 1916
- 33 the flattened sacs in a Cell are called
(a) thylakoid (b) cristae (c) cisternae (d) centriole
- 34 who discovered lysosomes ?
(A) Duve (b) Brown (c) King (d) TWK
- 35 in 1947 Nobel prize for physiology and medicines was won by
(A) Rene de Due (b) Golgi (c) Lamarck (d) Aristotle
- 36 a polymer of amino acids and sugars is

(A) peptidoglycan (b) glycolipid (c) phosphalid (d) glycogen

37 human body is made of _____ type of cells

(a)100 (b)200 (c) 300(d)400

38 the number of subunits of ribosomes

(a)2 (b) 4(c) 6(d)8

39 Protein synthesis in a plant cell is a function of

(a)Golgi complex (b)mitochondria (c)nucleus (d)ribosomes

40 Ribosomes are the sites of synthesis

(a)Protein(b) RNA (c)DNA (d)glucose

41 The organelle which produces energy

(a)Ribosome(b) vacuole (c)nucleus(d) mitochondria

42What is the function of Mitochondria

(a)Protein synthesis (b)transport(c) respiration (d)excretion

43In a Cell aerobic respiration sites are

(a)Ribosomes (b)endoplasmic reticulum (c)mitochondria (d)vacuole

43 Inner layers of Mitochondria

(a)Cristae(b) matrices (c)stroma(d) Thylakoid

44 The stack of thylakoids is called

(a)Leucoplast(b)stroma(c)cristae(d)granum

45 Stroma is found in

(a)Mitochondria(b) ribosome (c)Golgi body (d)chloroplast

46 Smallest size of bacteria is

(a)0.4 micrometer (b)0.3micrometer(c) 0.2 micrometer (d) 0.1 micrometer

47Gas exchange in gills and lungs occurs by the process

(a) diffusion (b) osmosis (c) active transport(d) turgor

48 which of the following tissue is found in all blood vessels?

(a)Smooth muscles (b)endothelium(c) skeletal muscles (d)connective tissue

49 which type of muscles are responsible for birds wings flapping?

(a)Skeletal muscles (b)smooth muscles(c) cardiac muscles (d)epithelial tissues

50 Cardiac muscles are present in walls of

(a)Lungs(b) heart (c)kidney (d)stomach

51 Bone is an example of (a)epithelial tissue(b) nervous tissue(c) connective tissue (d)muscle tissue

52 The tissue which is composed of nerve cells

(a) connective tissue (b)muscle tissue (c)nervous tissue (d)epithelial tissue

53 The cell responsible for coordination in body is

(a)bone cell(b) nerve cell (c)heart cell(d) skin cell

54 Ground tissues are made of which cells?

(a) Parenchyma(b) vessel elements (c) Tracheids (d) sieve tubes

55 Epidermal tissue is found in (a)pigeon(b) sparrow (b)grow (b)onions

Long Questions

Q.1 What is cell wall ? Write its structure and functions.

- Ans: **cell wall** All living organisms have cell walls around their cells, e.g animals and animal-like protists. Cell wall is a non-living and strong component of the cell, located outside the plasma membrane. It provides shape, strength, protection and support to the inner living matter (protoplasm) of cell

Structure and composition of cell wall Plant cells have a variety of chemicals in their cell walls.

The outer layer of the plant cell wall is known as primary wall and cellulose is the most common chemical in it.

Some plant cells, for example xylem cells, also have Secondary walls on the inner side of primary wall

It is much thicker and contains lignin and some other chemicals.

There are pores in the cell walls of adjacent cells, through which their cytoplasm is connected. These pores are called plasmodesmata.

Cell wall of fungi and prokaryotes

Fungi and many protists have cells although they do not contain cellulose. Their cell walls are made of variety of chemicals for example chitin is present in the cell wall of fungi.

Prokaryotes have a cell wall composed or peptidoglycan that is a complex of amino acids and sugars.

Q.2 what is cell membrane write ? some functions of cell membrane .

Cell membrane all prokaryotic and eukaryotic cells have a thin and elastic cell membrane covering the cytoplasm.

Functions the cell membrane functions as a semipermeable allowing a very few molecules across & while fencing the majority of chemicals inside cell in this way.

1 the membrane maintains internal composition of a cell

2 in addition to this vital role cell membrane can also sense chemical messages and can identify other chemicals.

Chemical compositions of cell membrane.

Chemical analysis reveals that cell membrane is mainly composed of proteins and lipids with small quantities of carbohydrates electron microscopic examination of cell membranes have led to the development of the fluid mosaic model of cell membrane.

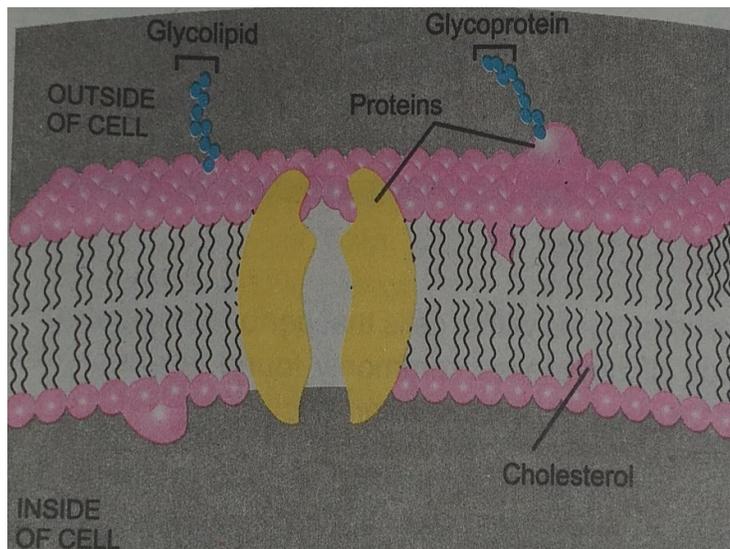
Fluid mosaic model of cell membrane.

According to it

1 there is a lipid bilayer in which the protein molecules are embedded.

2 The lipid bilayer gives fluidity and elasticity to membrane.

3 small amount of carbohydrates are found in cell membrane these are



joined with proteins and lipids of membrane.

4 in eukaryotic cells cholesterol is also present in lipid bilayer.

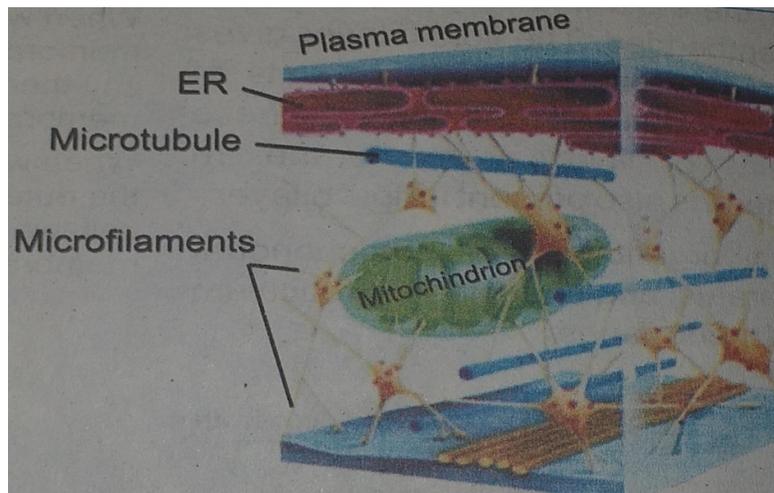
Q.3 what is meant by cytoskeleton ?write its chemical composition and functions.

Cytoskeleton

the cytoskeleton is an important complex and dynamic cell component it is invisible under light microscope.

Important features

- Cytoskeleton is a network of microfilaments and microtubules.
- Microtubules are made of tubulin protein and are used by cells to hold their shape they are also the major component of cilia and flagella.
- Microfilaments are thinner and are made of actin protein.They



have cells to change their shape.

Q.4 why do you know about nucleus? write its structure and functions.

Nucleus

A prominent nucleus occurs in eukaryotic cells

Location

In animal cells it is present in the center.

In mature plant cells due to the formation of large central vacuole it is pushed to side.

Structure and functions

Nucleus is bounded by a double membrane known as nuclear envelope

Nuclear envelope contains many small pores that enable it to act as a semipermeable membrane

Inside nuclear envelope are granular fluid for example nucleoplasm is present.

Nucleoplasm contains one or two nucleoli and chromosomes.

Nucleolus is our dark spot and it is where ribosomal RNA are formed and assembled as ribosomes.

chromosomes are visible during cell division while during interphase of cell they are in the form of fine thread like structures known as chromatin and chromosomes are composed of the of the Deoxyribonucleic acids and proteins.

The prokaryotic cells do not contain prominent nucleus their chromosome is made of DNA only and submerged in cytoplasm.

Q.5 write a short note on ribosomes.

Ribosome

ribosomes are tiny granular structures that are either floating freely in the cytoplasm or bound to the endoplasmic reticulum.

Structure of a Ribosome

ribosome is made up of almost equal amount of proteins and ribosomal RNA.

Ribosomes are not bound by membranes and so are also found in prokaryotes.

Eukaryotic ribosomes are slightly larger than prokaryotic ones.



Functions of ribosomes.

Ribosomes are the sites of protein synthesis .proteins and is extremely important to sales and so large number of ribosomes are found throughout the cells.

Subunits of ribosomes.

Ribosome is not working disassembles into two smaller units.

Q.6 what do you know about mitochondria ?write its structure and function.

Mitochondria.

Mitochondria are the double membrane bound structures found only in eukaryotes.

Functions.

These are the sites of aerobic respiration and are the major energy production centers in cells.

Structure.

Mitochondria are bound by double membranes.

- The outer membrane of Mitochondria is smooth.
- The inner membrane of Mitochondria forms many infoldings called Cristae in the inner mitochondrial matrix. This helps to increase the surface areas of the inner membrane on which membrane bound reactions can take place.
- Mitochondria have their own DNA and ribosomes.
- The Ribosomes of Mitochondria are more similar to bacterial ribosomes than eukaryotic ribosomes.

Q.7 write a note on plastids.

Plastids.

Plastids are also membrane bound organelles that only occur in plants and photosynthetic protists.

Types of plastids

There are three types. for example chloroplast, leucoplast and chromoplast.

Chloroplast

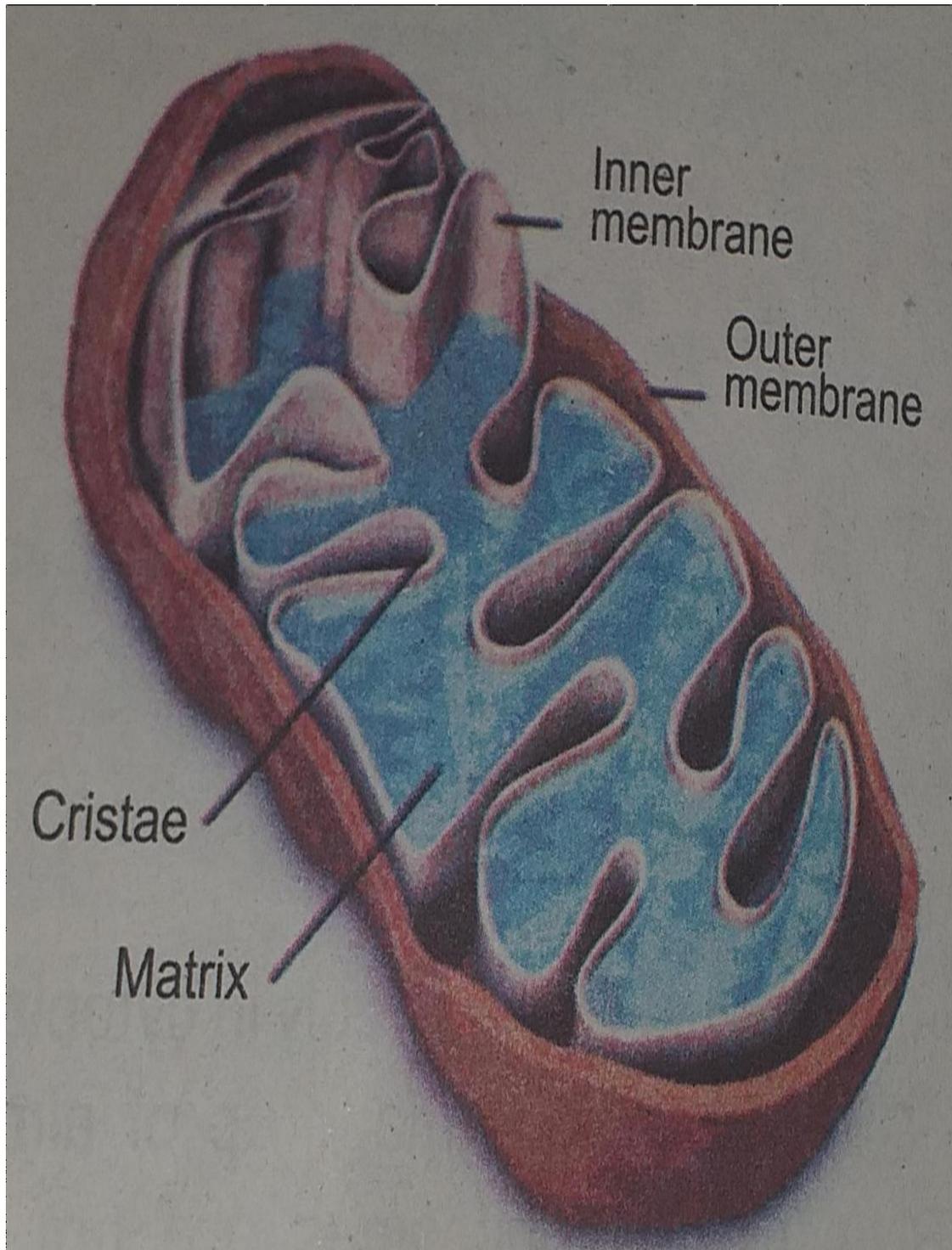
Like mitochondria chloroplast is also bound by a double membrane. The outer is smooth while the inner one gives rise to membranous sacs called thylakoids. The stack of thylakoids is called granum. Granum floats in the inner fluid of chloroplast for example stroma.

Function

Chloroplast are the sites of photosynthesis in eukaryotes they contain chlorophyll and associated pigments these pigments are present in the thylakoids of grana.

Chromoplast

The second type of plastids in plant cell are chromoplast they contain pigment associated with the bright colors and present in the cell of flower



petals and fruits.

Functions

Their function is to give color to these parts and has help in pollination and dispersal of fruit.

Leucoplast

Leucoplast are the third type of plastids they are colourless and store starch protein and lipids they are present in the cells of those part where food is stored.

Q.8 write a note on endoplasmic reticulum.

Endoplasmic reticulum

Endoplasmic reticulum is a network of interconnected channels that extends from cell membrane to the nuclear envelope.

Types. this network exist in two forms

Rough endoplasmic reticulum.

It is so named because of its rough appearance due to the numerous ribosomes attached to it due to the presence of ribosomes it serves a function in protein synthesis.

Smooth endoplasmic reticulum.

Smooth endoplasmic reticulum lacks ribosomes and is involved in lipid metabolism and in the transport of materials from one part of the cell to other it also detoxifies the harmful chemicals that have entered cell.

Q.9 write the structure and function of Golgi apparatus.

Golgi apparatus.

Discovery and structure.

Italian physician Camillo Golgi discovered a set of flattened sacs cisterna in cell.

- In this set many cisterna are stacked over each other the complete set of the cisterna is called Golgi apparatus or Golgi complex.
- It is found in both plant and animal cells

Function.

It modifies molecules coming from the rough endoplasmic reticulum and packs them into small membrane bound sacs called Golgi vessels. These sacs can be transported to various locations in cell or to be its exterior in the form of secretions.

Q.10 Who discovered lysosomes? write their structure and function.

Lysosomes

Discovery. In the mid twentieth century the Belgian scientist **Christian Rene de Duve** discovered lysosomes.

Structure

These are single membrane bound organelle is lysosomes contain strong digestive enzyme and work for The breakdown of food and waste materials within the cell.

Function

During its functional lysosome fuses with the vacuole that contains the targeted material and its enzymes breakdown the material.

Q.11 write down a note on vacuole.

Vacuole.

Vacuoles are fluid-filled single membrane bound organelles present in cytoplasm of cells.

Structure.

vacuoles are flute filled single membrane bound organelles .cells have many small vacuoles in their cytoplasm. However when a plant cell matures its small vacuoles absorb water and fuse to form a single large vacuole in center

The cell in this state becomes turgid

Functions

- many cells take in materials from outside in the form of food vacuole and then digest the material with the help of lysosomes material

- some unicellular organism use contractile vacuoles for the elimination of waste from their bodies.

Q.12 write down the main difference between prokaryotic and eukaryotic cell.

Prokaryotes possess prokaryotic cells which are much simpler than the eukaryotic cells. The main differences between prokaryotic and **eukaryotic** cells are given below.

Nucleus. Eukaryotic cells have a prominent nucleus while prokaryotic cells do not have prominent nucleus their chromosomes consists of DNA only and it floats in cytoplasm near Centre this region is called nucleoid.

Other organelles. Eukaryotic cell have membrane bound organelle is like mitochondria Golgi apparatus endoplasmic reticulum etc while such membrane bound organelles are not present in prokaryotic cells.

- The Ribosomes of eukaryotic cells are larger in size as compared to the ribosomes of prokaryotic cells

Size eukaryotic cells are on average 10 times larger than prokaryotic cells.

Cell wall the cell wall of eukaryotic cell is made of cellulose or chitin all prokaryotic cells have cell wall is made of peptidoglycan.

Q.13 what do you know about filtration? Explain it with the help of an example

Filtration

Filtration is a process by which small molecules are forced to move across semipermeable membrane with the aid of hydrostatic pressure or blood pressure

Explanation with example

For example in the body of an animal blood pressure force is water and dissolved molecules to move through the semipermeable membranes of the capillary wall cells .infiltration the pressure cannot force large molecules such as proteins to pass through the membrane pores.

Q.14 what is active transport? Explain with the help of an example

Active transport

active transport is the movement of molecules from an area of lower concentration to an area of higher concentration. This movement against the concentration gradient requires energy in the form of ATP. In this process, carrier proteins of the cell membrane use energy to move the molecules against the concentration gradient.

Explanation with example the membranes of nerve cells have carrier proteins in the form of sodium potassium pump. In a resting nerve cell, this pump spends energy to maintain a higher concentration of K⁺ and a lower concentration of Na⁺ inside the cell. For this purpose, the pump actively moves Na⁺ to the outside of the cell where they are already in higher concentration. Similarly, this pump moves K⁺ from outside to inside the cell where they are in higher concentration.

Q.15 Explain the types of epithelial tissues.

Epithelial tissues

- Epithelial tissue covers the outside of the body and lines organs and cavities.
- The cells in this type of tissue are very closely packed together.
- This tissue has many types on the basis of the shape of cells as well as the number of cell layers sometimes included.

Squamous epithelium

Consists of a single layer of flat cells. It is found in lungs, heart, and blood vessels. Here it allows the movement of materials across it.

Cuboidal epithelium

Consists of a single layer of cube-shaped cells. It is found in kidney tubules, small glands, etc. where it makes secretion.

Columnar epithelium

Has tall, columnar cells. It is found in elementary canal, gallbladder, etc. where it makes secretion.

Ciliated columnar epithelium

Has elongated cells with cilia it is present in trachea and bronchia and propels mucous.

Stratified squamous epithelium

Has many layers of flat cells it is present in the lining of oesophagus and mouth and also over the skin it protects the inner parts.

Q.16 write a note on muscle tissues.

Muscle tissue consists of bundles of long cells called muscles fibers

It is the most abundant tissue in animal

The cells of this tissue have ability to contract

Types of muscle tissues

There are three kinds of muscle tissue

Skeletal muscle

Skeletal muscles or striated muscles are attached to bones their cells are striated and contain many nuclei they are responsible for the movement of bones. Skeletal muscles are voluntary action their contraction is under the control of our will.

Smooth and Cardiac muscles

Smooth and Cardiac muscles are involuntary in action their contraction is not under the control of our will. Smooth muscles are found in the walls of alimentary canal urinary bladder blood vessels etc there contains more cells each with single nucleus they are responsible for the movement of substances. Cardiac muscles are present in the wall of heart their cells are also striated but there is a single nucleus in each cells they produce heartbeat.

Q.17 write a note on meristematic tissue.

Meristematic tissue

- these tissues are composed of cells which have the ability to divide
- the cells are thin walled have large nucleus and small or no vacuoles
- They do not have intercellular spaces among them.

- Two main types of meristematic tissues are recognized in plants.
- **Apical meristems** are located at the apices of root and shoot when they divide they cause increase in the length of plants such a growth is called primary growth.
- **Lateral meristems** located on the lateral sides of root and shoot by dividing they are responsible for increase in girth of plant parts this growth is called secondary growth.
- **Types of lateral meristems** they are further of two types vascular cambium and cork cambium

Q.18 write a note on support tissues.

This issues provides strength and flexibility to plants

Types they are further of two types of support tissues. These are

Collenchyma tissue

- They are found in cortex of young stems and in the midribs of leaves and in petals of flowers.
- They are made of elongated cells with unevenly thickened primary cell walls.
- They are flexible and function to support the organs in which they are found.

Sclerenchyma tissue.

They are composed of Cells with rigid secondary cell walls . the cell walls are hardened with lignin which is the main chemical component of wood .Mature sclerenchyma cells cannot elongate and most of them are dead.

Q.19 write a note on xylem tissue.

Xylem tissue

- Responsible for the transport of water and dissolved substances from roots to the aerial parts
- Due to the presence of lignin the secondary walls of its cells are thick and rigid.

- That is why xylem tissue provides support to the plant body.
- Two types of cell are found in xylem tissue for example vessel elements and tracheids.
- Vessel elements of cells have thick secondary cell walls they lack end walls and join together to form long tubes. Tracheids are slender cells with overlapping ends

Q.20 write a note on phloem tissue.

phloem tissue is responsible for the conduction of dissolved organic matter between different parts of the plant body. Phloem tissue contains sieve tube cells and companion cells

Sieve tube cells

They are long and their end walls have small pores. Many sieve tube cells join to form long sieve tubes.

Companion cells

They make proteins for sieve tube cells.

Short Questions

1 _Who discovered the first compound microscope?

The first compound microscope was developed by Zacharias Janssen Holland in 1595. It was simply a tube with lenses at each end and its magnification range from 3x to 9X.

2_Define magnification and resolution

Magnification the increase in the apparent size of an object is called magnification. It is an important factor in microscopy.

Resolution the measure of clarity of an image is called resolution or resolving power. It is the minimum distance at which two objects can be seen as separate objects.

3_Define microscopy

The use of microscope is known as microscopy

4_What is a micro graph?

A Photograph taken by a microscope is known as micro graph.

5_What is meant by transmission electron microscope?

In TEM electrons are transmitted through the specimen. It is used to study the internal cell structure

6_Write down any two principles included in a Cell theory?

1 all organisms are composed of one or more cells.

2 cells are the smallest living things the basic unit of organization of all organisms.

3 cells arise only by divisions in previously existing cells.

7_Differentiate between primary and secondary cell wall

Primary cell wall the outer layer of the plant cell wall is known as primary wall and cellulose is the most common chemical in it.

Secondary cell wall some plant cells for example xylem cells also have secondary walls on the inner side of primary wall it is much thicker and contains Lignin and some other chemicals.

8_ Define cell membrane?

In prokaryotic and eukaryotic cells have a thin and elastic membrane which covers the cytoplasm it is called cell membrane.

9_Write about fluid mosaic model of cell membrane

Electron microscope reveals the fluid mosaic model of cell membrane according to it.

- 1 There is lipid bilayer in which protein molecules are embedded.
- 2 Lipid bilayer gives fluidity and elasticity to the membrane.
- 3 Small amount of carbohydrates are also found in cell membranes.
- 4 In eukaryotic cell Cholesterol is also present in lipids bilayer.

10_Define plasmodesmata.

Plasmodesmata there are pores in the cell wall of adjacent cell through which the cytoplasm is connected these pores are called plasmodesmata.

11_Define thylakoids?

The inner membrane of chloroplast give rise to sacs floating in the fluid stroma are called thylakoids.

12_Define facilitated diffusion.

The movement of molecules from higher concentration to lower concentration with the help of carrier protein is called facilitated diffusion.

13_What is turgor pressure?

The outward pressure on the cell wall exerted by internal water due to entry of water. when the plant cell is placed in hypotonic environment is called turgor pressure and this phenomena is called as turgor .

14_Define plasmolysis

Plasmolysis the process of shrinking of cytoplasm due to loss of water from cell when a plant is placed in hypertonic environment called plasmolysis.

15_ Define secondary growth.

Lateral meristem are located on the lateral sides of roots and shoots .By dividing they are responsible for increase in thickness of plant parts this growth is called secondary growth.

16_ What is stroma?

stroma is a fluid with in the chloroplast in which thylakoids floats.

17_ Why rough endoplasmic reticulum is called as rough endoplasmic reticulum?

Due to the presence of ribosomes on its surface its appearance look rough so it is called as rough endoplasmic reticulum.

18_ What is diffusion?

The movement of molecules from higher concentration to lower concentration is called as diffusion.

19_ Define active transport.

the movement of molecules from the area of lower concentration to the area of higher concentration with the expenditure of energy in the form of ATP is called as active transport.

20_ What is filtration?

filtration as a process by which small molecules are forced to move across the semipermeable membrane with the aid of hydrostatic pressure or blood pressure.

21_ What is meant by endocytosis? Also write names it's types.

Endocytosis it is a the process of cellular injection of bulky material by the in folding of cell membrane the two forms of endocytosis are **phagocytosis** and **pinocytosis**

22_ Define exocytosis?

It is the process from which bulky material is exported.

23_ Write two differences between skeletal and smooth muscles

Smooth muscles smooth muscles are found in the walls of alimentary canal urinary bladder blood vessels etc. they contain non striated cells each with a single nucleus they are responsible for the movement of substances.

Skeletal muscles the cells are striated and contain many nuclei they are responsible for the movement of bones.

24_ Differentiate between simple tissues and compound tissues in plants.

Compound tissues plant tissue composed of more than one type of cell is called a compound or complex tissue for example xylem and phloem.

Simple tissues The tissues which are made of single type of cells is called simple tissues.

25_ What is meant by collenchyma tissue?

They are found in cortex of young stems and in the midribs and petals of flowers. They are made of elongated cells and unevenly thickened primary cell wall.

26_ What is meant by the term tonicity?

The term refers to the relative concentration of solutes in the solution being compared.

27_ Differentiate between Cristae and cisternae.

Cristae the inner membrane of Mitochondria has many infoldings called Cristae .

Cisternae the set of flattened sacs of Golgi apparatus in cell is called cisternae.

28_ What is the role of nucleus?

Nucleus control all the activities of cell.

29_ Differentiate between voluntary and involuntary muscles.

Voluntary muscles The types of muscles are called voluntary muscles if their contraction is under the control of our will.

Involuntary muscles the type of muscles whose contraction are not under the control of our will are called in voluntary muscles.

30_ Write the functions of xylem and phloem tissues.

Xylem tissues xylem tissue is responsible for the conduction of water and dissolved substance from roots to the aerial parts. Due to the presence of their lignin there walls are thick and provide support to the plant body.

Phloem tissues phloem tissues are responsible for the transmission of organic material to the different parts of plant.