

## I PUC

### ***Chapter No. 8. Cell: The Unit Of Life***

#### **➤ One mark Questions and Answers**

1. What is cell / Define cell?

Ans: Cell is structural and functional unit of the organism.

2. Which is the basic unit of life ?

Ans: Cell.

3. Name the building blocks of body ?

Ans: Cells

4. Who gave the term cell?

Ans: Robert Hooke [1665]

5. Who first observed the live cell?

Ans: Anton Von Leewenhock [1677]

6. Which is the physical basis of life?

Ans: Protoplasm

7. Who formulated the cell theory ?

Ans: M.J.Schleiden and T.Schwann [1838-39]

8. What are cell organelles ?

Ans: Membrane bound distinct structures found in eukaryotic cells

9. Which is the smallest known cell ?

Ans: Mycoplasma

10. Which is the largest known cell ?

Ans: Egg of ostrich

11. Expand PPLO?

Ans: Pleuro Pneumonia like Organisms

12. What are plasmodesmata?

Ans: Intercellular connections in between plant cells.

13. What is the chief role of plasmodesmata?

Ans: Exchange of materials.

14. What are ergastic matters ?

Ans: Non living inclusions in plant cells

15. Is the cell wall living or dead ?

Ans: Dead

16. Where is cell wall found ?

Ans: In the cells of bacteria, fungi, algae and plants

17. Name the cell wall material of eubacteria ?

Ans: Muramic acid or muerein

18. Name the cell wall material of fungi ?

Ans: Chitin

19. Name the Chief cell wall material of plants?

Ans: Cellulose

20. Name the membrane of vacuole

Ans: Tonoplast

21. What is mesosome

Ans: Membranous structure formed by infolding of plasma membrane in prokaryotic cell

22. Why plasma membrane in plant cell is called as selectively permeable membrane?

Ans: It allows the passage of certain selected molecules through it.

23. Who proposed fluid mosaic model of plasma membrane?

Ans: Fluid mosaic model proposed by Singer and Nicholson in 1972.

24. Name the cell organelle known as suicidal bag?

Ans: Lysosome.

25. Mention a single membrane bound organelle which is rich in hydrolytic enzymes?

Ans: Lysosomes.

26. What are fimbriae?

Ans: Fimbriae are small, bristle-like fibres sprouting out of the cell in bacteria.

27. Name the protein found in pilli of bacterial cell?

Ans: pilin.

28. What is the chemical composition of middle lamella?

Ans: calcium and magnesium pectate.

29. Which is the cementing layer between two cells?

Ans: middle lamella.

30.What is pinocytosis ?

Ans: Ingestion of fluid material through plasma membrane.

31.What is phagocytosis ?

Ans: Ingestion of solid particles through plasma membrane.

32.What are Eukaryotic cells?

Ans: Cells that have membrane bound nucleus.

33. What are prokaryotic cells?

Ans: Cells that lack a membrane bound nucleus.

34. Which organelle is considered as the power house of the cell ?

Ans: Mitochondria .

35. Which organelle is called protein factory of the cell ?

Ans: Ribosome where protein synthesis occurs.

36. What are plasmids?

Ans: Small, circular DNA ‘ molecules found in bacteria.

37. What is axoneme?

Ans: Core of flagellum or cilia containing microtubules running parallel to the long axis.

38. Which molecule stores cellular information ?

Ans: DNA.

39.What is cytoskeleton ?

Ans: A network of filamentous proteinaceous structures present in the cytoplasm.

40. What is cytoplasm ?

Ans: Homogeneous fluid , jelly - like substance occupies the volume of cell containing cell organelles

41. What is a centromere ?

Ans: Primary constriction of the chromosome

42. What are chromosomes ?

Ans: Self duplicating filamentous or rodshaped nuclear components of eukaryotes and are Vehicles of hereditary characters.

43. What is eukaryotic cell ?

Ans: Cell without nucleus .

44. Give one example of plant eukaryotic cell ?

Ans: Sieve tube of phloem.

45. Give one example of animal eukaryotic cell?

Ans: Erythrocytes or RBC of blood.

**TWO MARK**  
**Questions and Answers**

1. Briefly describe the cell theory?

Ans: Schleiden and Schwann proposed the cell theory in 1839 which states that

- i) All living things are made up of cells and products of cells
- ii) All cells arise from pre-existing cells

2. List out functions of cell wall ?

Ans: i) Cell wall provides rigidity and shape to the cell.

- ii) Cell wall forms an outer boundary and is protective in function.

3. Write the functions of plasma membrane ?

Ans: i) It allows passage of certain selected molecules through it

- ii) It involves in the process of osmosis and active transport

- iii) Maintains shape and form of the cells in plants and animals.

- iv) Helps in ingestion of liquids (pinocytosis) and solids (phagocytosis)

4. List out any four differences between plant cell and animal cell

Ans : **plant cell** **Animal cell**

- |                        |                    |
|------------------------|--------------------|
| 1. Cell wall present   | Cell wall absent   |
| 2. Chloroplast present | Chloroplast absent |
| 3. Centriole absent    | Centriole present  |
| 4. Vacuoles large      | Vacuoles small     |

5. What are plastids mention their types?

Ans: Pigment containing cell organelle found in plant cells. They are three types.

- i) Chloroplast (green)
- ii) Chromoplast (colored) and
- iii) Leucoplast (colorless)

6.. List out the functions of golgi complex ?

Ans : i) Modification and package of proteins

ii) Acrosome of sperm is produced by the golgi complex

iii) Golgi complex produces lysosomes

iv) Formation of glycoproteins and glycolipids

7. Mention the types of chromosomes based on the position of centromere

Ans : i) Meta centric

ii) Sub meta centric

iii) Acrocentric

iv) Telocentric

8. Mention the different shape of cells with some examples.

Ans : The cells differ from each other in shape and size They may be disc like, spherical, rectangular, cylindrical ,polygonal, columnar, cuboids, thread like elongated, flat or irregular

**Example-** i) Red blood cells [Round and biconcave ]

ii] white blood cell [Amoeboid]

iii] columnar epithelial [finger like ]

iv] Squamous epithelial cell [flat ]

v] Nerve cell [Branched and long]

vi] Tracheid [elongated]

9. Differentiate between gram positive and gram negative bacteria.

**Gram positive**

**Gram negative**

i) They are stained by gram stain	i) They are not stained by gram stain
ii) cell wall is thin	ii) Cell wall is thick

10. Differentiate between cilia and flagella.

<b>cilia</b>	<b>Flagella</b>
i) It is short	i) It is Long
ii) more in number	ii) Few in number

11. what structural and functional characteristics of cilia flagella and centrioles have in common.?

Ans: The common structural features of cilia, flagella and centriole

is that all of them have basal bodies as starting point which has [9+2] arrangement of triplets of microtubules. Functionally, they show contraction and expansion causing movement

12. Differentiate Heterochromatin and euchromatin?

Ans :

<b>HETERO CHROMATION</b>	<b>EUCHROMATION</b>
i)Exhibit condensed state	i) Exhibit diffused state
ii)Deply stainable part of chromatin	ii) lightly stainable part
iii)Replication is slower	iii)Replication is faster
iv)Less active	iv)More active

13. Why are lysosomes called “suicidal bags” ?

Ans : Lysosomes are sac like structures bounded by single membrane. They contain hydrolytic enzymes. when these enzymes are released bring about breakdown of the various cytoplasmic structures. Sometimes this may leads to death of cells also.



## ***Four mark***

### ***Questions and Answers***

1. What are the characteristics of prokaryotic cell?

Ans:1] Cells are smaller and multiply more rapidly

2] Size and shape of cells vary greatly

3] There is no well organized nucleus i.e nuclear membrane absent. Thus genetic material is naked.

4] Except mycoplasma, all other prokaryotes have a cell wall.

5] In addition to large circular genetic DNA, many bacteria have small circular DNA called plasmids.

6] cell organelles are absent except ribosome.

7] Cell membrane infoldings called mesosomes are the unique feature of prokaryotes.

2. write differences between prokaryotic and eukaryotic cells.

<b>Prokaryotes</b>	<b>Eukaryotes</b>
1.They do not have well organized nucleus [i.e nuclear membrane absent]	1.They have well organized nucleus [i.e.nucleus has nuclear membrane]
2.Cell organelles are absent except ribosome.	2.Cell organelles present.
3.Genetic material DNA without histone proteins.	3.Genetic material DNA with histone proteins organized into chromosome.
4.DNA found in nucleoid.	4.Chromosomes found in nucleus.

3. Describe the types of chromosomes based on the position of centromere.

Ans-Based on the position of centromere chromosomes are of four types.

1] Metacentric chromosome -The centromere is at middle position hence both the arms are equal in lengths. They assume V shape during anaphase.

2) Sub metacentric chromosome-Centromere is at nearer to the middle of the chromosome. It appears like L-shaped.

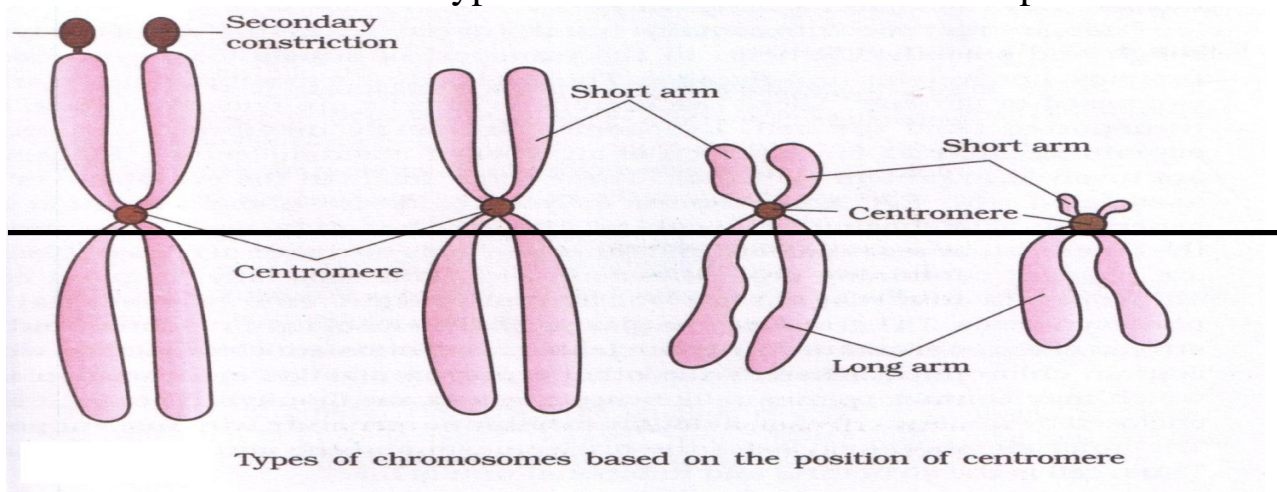
3) Acrocentric chromosome-Centromere is at nearer to the end of the chromosome. It appears like J-shaped.

4) Telocentric chromosome-Centromere is at terminal position. The chromosome appears like I-shaped during anaphase.

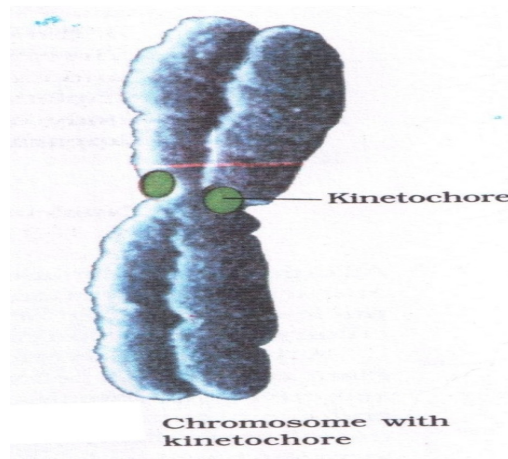
## Five marks

### *Questions and Answers*

1. Describe the typical structure of metaphase chromo



some with a sketch.



Ans:Chromosome in the late metaphase stage of cell division is most ideal for study of its structure. A typical chromosome has following parts

i)Chromatids – chromosome appears double composed of two identical units called chromatids

ii) chromonema – Each chromatid is composed of a thread like fibre called chromonema(30nm fibre).The chromonema is made up of DNA with histones.

iii)Centromere –The two chromatids are held together at a point called centromere (Primary constriction )

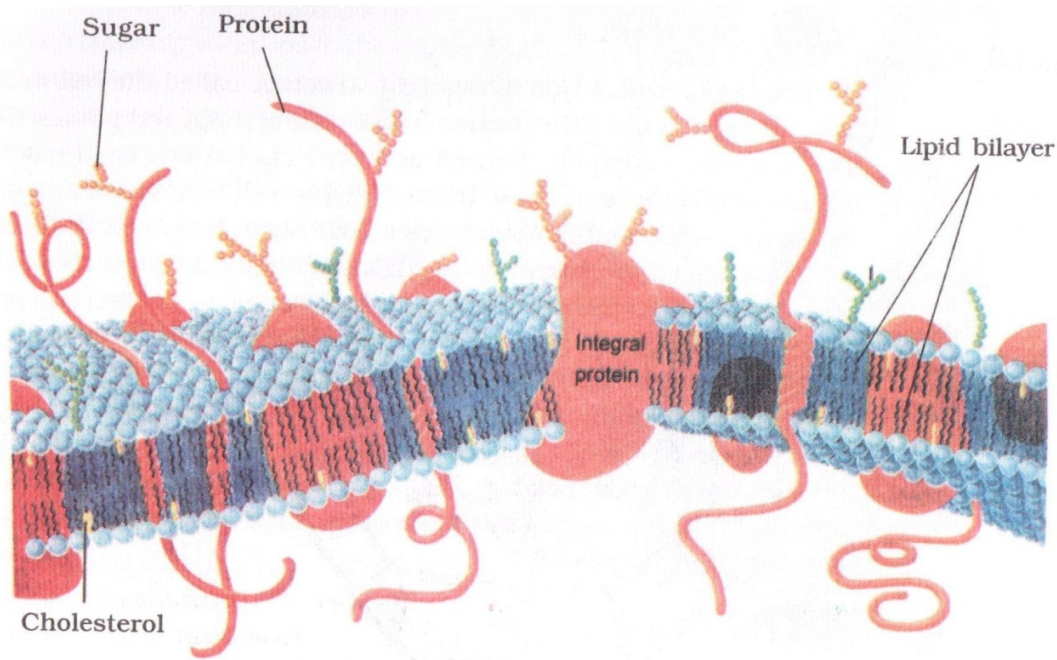
iv)Kinetochore – Centromere shows laterally proteinaceous structure called kinetechore to which spindle fibres get attach.

v)Secondary constriction – some chromosomes exhibit an additional constriction any where along their length.

vi) Satellite – The region beyond secondary constriction looks like sphere and is called satellite

vii) Telomere – The tip of the chromosome is called telomere.

2.With a neat labelled diagram describe the fluid mosaic model of plasma membrane.



Fluid mosaic model of plasma membrane

Ans: S .T. Singer and G. Nicolson [1972]proposed the model.

-According to this model plasma membrane is formed by a bi layer of phospholipids and proteins.

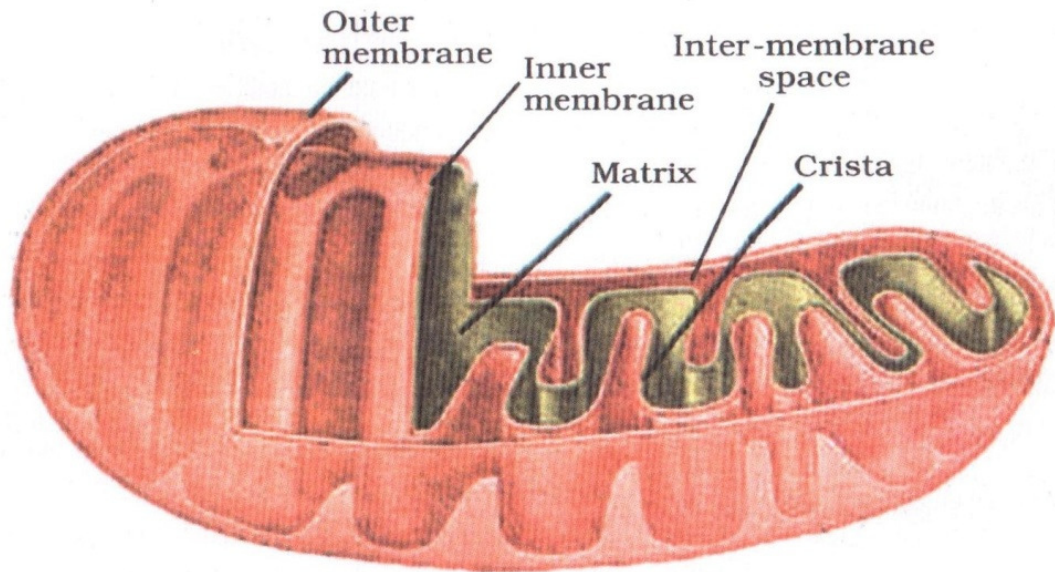
-The polar hydrophilic head part of lipids are located near the two surfaces.

-The giant protein molecules are distributed at random. Thus a mosaic pattern is formed. Peripheral proteins lie on the surface while the integral proteins are partially or totally burried in the membrane.

-A few oligosaccharide molecules are found attached to the free end of proteins.

Proteins and lipids are arranged in such a way that they exhibit the semisolid and semifluid properties giving flexibility to membranes.

3. Describe the structure of mitochondria with a labeled sketch. mention its fuctions.



Structure of mitochondrion (Longitudinal section)

Ans : size of mitochondria varies from 0.2micron to 1.0 micron in diameter and 2 to 8 micron in length

-Mitochondria is a double membrane structure. Inner membrane folded many times and form cristae

-The space between the two membrane is called perimitochondrial space

On the the inner surface of the inner membrane there are knob like particles called Rackers particles they involve in electron transport system

The mitochondrial matrix is granular fluid like substance contain prokaryotic ribosomes , DNA and several enzymes necessary for krebs cycle

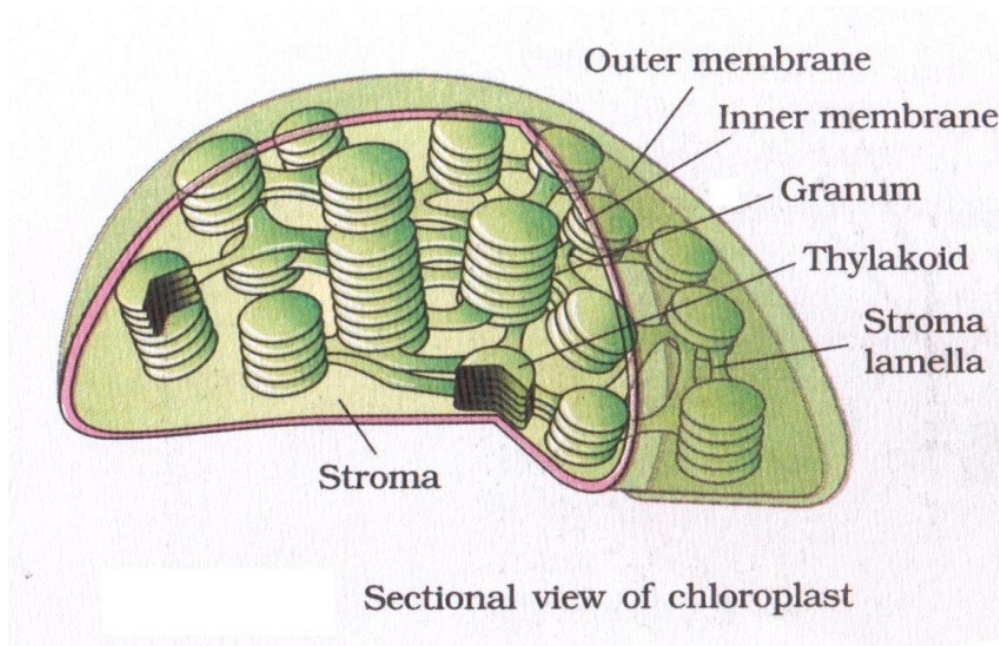
### **Functions:**

i] site of aerobic respiration and ATP generation hence they are called power hence of the cell.

ii] Mitochondria provide different intermediates for the synthesis of biomolecues like cytochrome anthocyanine etc



4. With neat labelled diagram describe the structure and function of chloroplast.



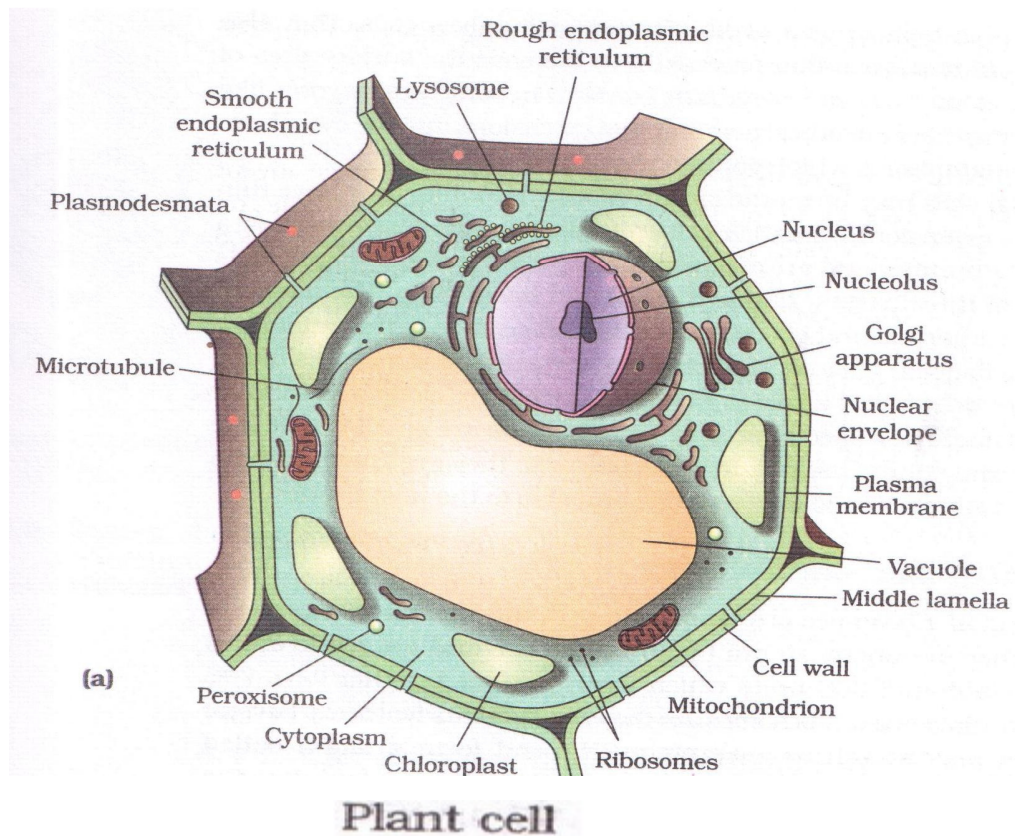
Ans: Chloroplasts are green plastids

Chloroplasts occur in the cytoplasm of all the green cells of plants, where photosynthesis occurs. They are oval, spherical, even ribbon-like organelles having 5-10mm length and 2-4mm width. It is bounded by two membranes. The space between the two membranes is called periplastidial space.

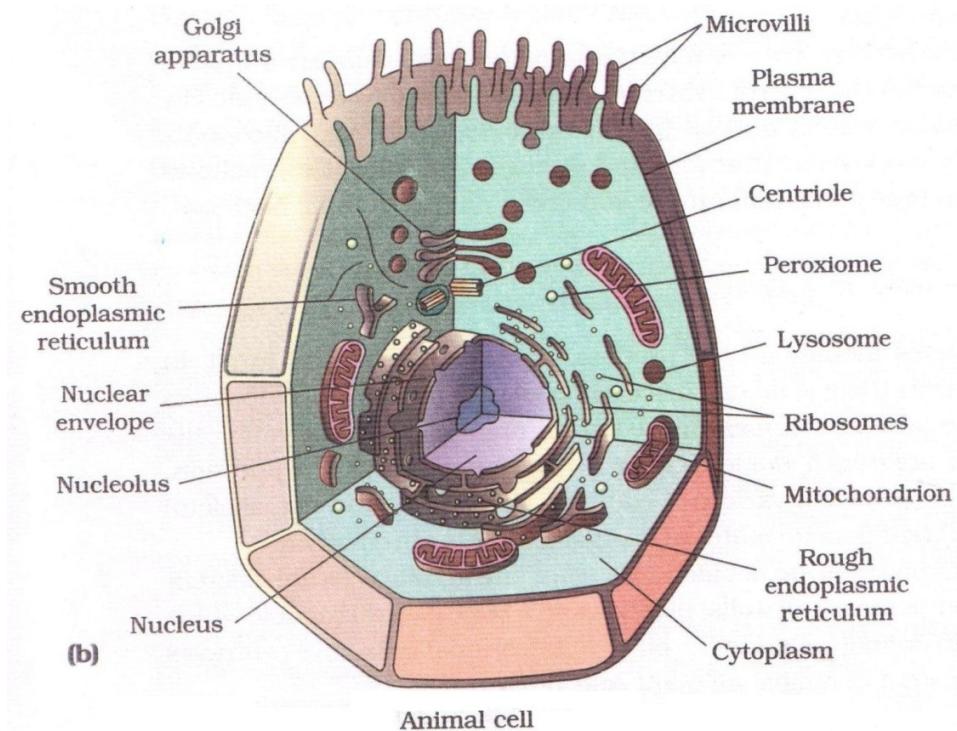
The space limited by the inner membrane of the chloroplast is called stroma. It contains a colourless watery fluid, enzymes of photosynthesis, circular DNA, RNA, ribosomes. Stroma is the site of dark reaction. In the stroma, there are membrane-bound, flattened sacs called thylakoids. They are arranged one above the other and constitute a granum (plural-grana). Thylakoids contain photosynthetic pigments like chlorophyll, carotenoids, xanthophylls etc. Grana are the site of light reaction.

Function- It is the site of photosynthesis.

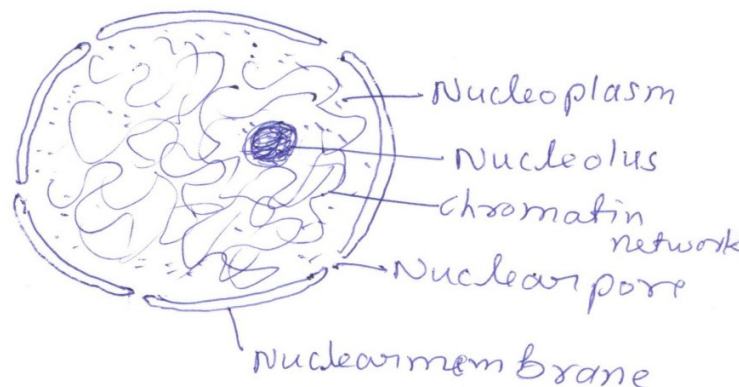
5. Draw a neat labeled diagram of a plant cell



6. Draw a neat labeled diagram of animal cell



7. With neat labeled diagram describe the structure and function of the nucleus



Ans:- There are four component forming the nucleus:-

1)Nuclear membrane – It is double layered. Each membrane is 100A thick. It has many pores called nuclear pores, Which connect nucleoplasm with cytoplasm. Nuclear membrane. Space between two membrane is called perinuclear space.

2)Nucleoplasm – It is also called karyolymph.It has dense fluid with protein granules, some free RNA and enzymes.

3) Chromatin network – Chromatin threads seen in the interphase of the nucleus, There threads condense into the chromosomes during cell division. The chromatin network consists DNA and histone proteins.

4) Nucleolus – It is spherical structure of the interphase nucleus It usually disappear during cell division. protein and RNA are the components of nucleolus.

Functions of nucleus

- 1] Nucleus is controlling centre of a cell
- 2]Nucleus controls all the metabolic activities of the cell
- 3]Nucleus is the seat of genetic material
- 4]Nucleolus synthesize the ribosome
- 5]RNA synthesis take place in nucleus.

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