

## Objective

1. The digestive vacuoles and autophagosomes are also called:
 

<input type="radio"/> (A) Endocytosis	<input type="radio"/> (B) All of these
<input type="radio"/> (C) Primary Lysosomes	<input checked="" type="radio"/> (D) Secondary Lysosomes

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2. The digestive vacuoles and autophagosomes are also called:
 

<input type="radio"/> (A) Golgi complex	<input type="radio"/> (B) Plastids	<input checked="" type="radio"/> (C) Lysosome	<input type="radio"/> (D) Mitochondria
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3. Tay - sach's disease is because of the absence of enzyme involved in catabolism of:
 

<input type="radio"/> (A) Glycogen	<input type="radio"/> (B) Nucleic acid	<input checked="" type="radio"/> (C) Lipids	<input type="radio"/> (D) Protein
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4. The lysosomes which eat parts of its own cell are known as:
 

<input type="radio"/> (A) Primary Lysosome	<input type="radio"/> (B) Secondary Lysosomes
<input type="radio"/> (C) Phagocytic Lysosome	<input checked="" type="radio"/> (D) Autophagosomes

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5. In the disease glycogenosis Type II , glycogen fills the liver and:
 

<input type="radio"/> (A) Kidneys	<input checked="" type="radio"/> (B) Muscles	<input type="radio"/> (C) Lungs	<input type="radio"/> (D) Pancreas
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6. Vacuoles are present ..... in.
 

<input type="radio"/> (A) None of these	<input type="radio"/> (B) Plant cell	<input checked="" type="radio"/> (C) Both D& B	<input type="radio"/> (D) Animal cell
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7. Vacuoles serve to expand the plant cell without diluting its:
 

<input type="radio"/> (A) Cell wall	<input type="radio"/> (B) Cell membrane	<input checked="" type="radio"/> (C) Cytoplasm	<input type="radio"/> (D) Both A & B
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8. Vacuoles functions as sites for the storage of ..... and cell products or metabolic intermediates:
 

<input type="radio"/> (A) Food	<input type="radio"/> (B) None of these	<input type="radio"/> (C) Waste of cell	<input checked="" type="radio"/> (D) Water
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9. The plant vacuole is the major contributor to the.....
 

<input type="radio"/> (A) None of these	<input checked="" type="radio"/> (B) Turgor	<input type="radio"/> (C) Diffusion	<input type="radio"/> (D) Active transport
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10. What is not true for microtubules?
 

<input type="radio"/> (A) Cilia are derived from them	<input type="radio"/> (B) Play role in spindle formation
<input checked="" type="radio"/> (C) Branched	<input type="radio"/> (D) Formed of tubulin

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11. The protein present in microtubule is:
 

<input type="radio"/> (A) Tropomyosin	<input type="radio"/> (B) Tetroses	<input type="radio"/> (C) Tetroses	<input checked="" type="radio"/> (D) Tubulin
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12. Cilia , flagella and centrioles are special assemblies of:
 

<input type="radio"/> (A) Microfilaments	<input type="radio"/> (B) Microfibers
<input checked="" type="radio"/> (C) Microtubules	<input type="radio"/> (D) Intermediate filaments

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13. Cyclosis and amoeboid movements are because of:
 

<input type="radio"/> (A) Intermediate filaments	<input type="radio"/> (B) Microfibers
<input checked="" type="radio"/> (C) Microfilaments	<input type="radio"/> (D) Microtubules

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14. When cross - section of centriole is observed it shows as it consists of:
 

<input type="radio"/> (A) 6 - microtubules	<input checked="" type="radio"/> (B) 9 - microtubules	<input type="radio"/> (C) 11 - microtubules	<input type="radio"/> (D) 3 - microtubules
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15. Which of the following organelle is involved in location of furrowing during cell division?

- (A) Microfilament    **(B) Centriole**    (C) Vacuole    (D) Microtubule
16. Centriole play important role in formation of:  
(A) Flagella    (B) Microfilament    **(C) Cilia**    (D) None of these
17. The two centriole are usually placed at ..... to each other.  
(A) Parallel    (B) None of these    (C) Opposite    **(D) Right angle**
18. Infolding of inner membrane of mitochondria are called as:  
(A) Cristae    (B) Cisternae    **(C) Granum**    (D) Thylakoid
19. Cristae are found in:  
(A) Chloroplast    **(B) Mitochondria**    (C) Golgi complex    (D) Endoplasmic
20. Organelle of symbiotic origin is:  
(A) Vacuole    (B) Cell membrane    **(C) Mitochondria**    (D) Cell wall
21. A true wall that develops in newly growing cells is:  
(A) Middle lamella    (B) All of these    (C) Secondary wall    **(D) Primary wall**
22. The middle lamella is first to be formed in between:  
(A) Quaternary walls    (B) Tertiary walls    **(C) Primary walls**    (D) Secondary walls
23. The ..... is formed on its inner surface:  
(A) Tertiary wall    **(B) Secondary wall**    (C) None of these    (D) Primary wall
24. Fungal cell wall contains .....  
**(A) Chitin**    (B) Action    (C) Cytosin    (D) None of these
25. Cell wall provides a definite shape to the cell and keeps it:  
(A) Soft    **(B) Rigid**    (C) Both A & B    (D) Hard
26. The soluble part of the cytoplasm is called:  
(A) Matrix    (B) Gel    **(C) Cytosol**    (D) Stroma
27. A non - viscous colloidal solution is called:  
(A) Stroma    (B) Cytosol    (C) Gel    **(D) Sol**
28. Cytoplasm is a site for certain metabolic processes such as:  
(A) Glyoxylate cycle    (B) Calvin cycle    **(C) Glycolysis**    (D) Krebs cycle
29. How much water is present in cytoplasm:  
(A) 80 %    **(B) 90 %**    (C) 60 %    (D) 40 %
30. Gel is a ..... colloidal solution.  
(A) Sol    (B) Non-viscous    **(C) Viscous**    (D) None of these
31. Harmful substances are detoxified in the liver cells by:  
(A) Golgi complex    **(B) Endoplasmic reticulums**    (C) Nucleollus    (D) Mitochondria
32. Cisternae are associated with:  
(A) Chloroplast    (B) Nucleus    **(C) ER**    (D) Mitochondria
33. The rough surface endoplasmic reticulum is involved in the synthesis of:

- (A) Glycolipids      (B) Ribosomes      (C) Lipids      (D) Proteins
34. SER also helps in metabolism of a number of different types of molecules , particularly:  
(A) Carbohydrates      (B) None of these      (C) Proteins      (D) Lipids
35. A structure found attached to membranes in cell . It consists of two parts . Name it:  
(A) Golgi Apparatus      (B) Mitochondria      (C) Ribosome      (D) Lysosome
36. The attachment of two sub fibrous protein is controlled by presence of:  
(A) Fe<sup>2+</sup>      (B) K<sup>+</sup>      (C) Mg<sup>2+</sup>      (D) Ca<sup>2+</sup>
37. Proteins are synthesized by:  
(A) Lysosome      (B) Nucleosome      (C) Polysome      (D) Ribosome
38. The enzyme which are involved in protein synthesis are integral part of:  
(A) Ribosomes      (B) Lysosomes      (C) Ribosomes      (D) Chromosomes
39. Palade was the first person to study the:  
(A) Peroxisomes      (B) Polysomes      (C) Lysosomes      (D) Ribosomes
40. Factory of ribosomes synthesis is:  
(A) Lysosomes      (B) Nucleolus      (C) Endoplasmic      (D) reticulum
41. Most of the cell secretions are in the nature:  
(A) Carbohydrates      (B) Proteins      (C) Glycoproteins      (D) Lipids
42. Golgi apparatus is concerned with cell:  
(A) Lipids      (B) Storage      (C) Division      (D) Secretion
43. Golgi apparatus was discovered by Golgi in:  
(A) 1888      (B) 1898      (C) 1889      (D) 1896
44. Golgi complex is concerned with:  
(A) Protein synthesis      (B) Phagocytosis      (C) Cell secretions      (D) Power house of cell
45. Which statement about the nuclear envelope is not true?  
(A) It is a double membrane structure      (B) RNA and some proteins pass through it  
(C) Its inner membrane bears ribosomes      (D) It has pores
46. Which type of cell would probably be most appropriate to study lysosomes?  
(A) Mesophyll cell of leaf      (B) Nerve cell  
(C) Phagocytic white blood cells      (D) Muscle cell
47. During ..... the tissues are homogenized or disrupted with special instruments.  
(A) Centrifugation      (B) Cell fractionation      (C) None of these      (D) Catalysis
48. The various cellular parts separate out in different layers depending upon their size and ....., and density of the medium.  
(A) Weight      (B) Length      (C) Height      (D) None of these
49. The primitive type of cells , such as bacteria , lack a definite nucleus and are said to be:  
(A) Eukaryotic      (B) Prokaryotic      (C) Both A & B      (D) None of these
50. Most of the cells are ..... and are not visible to the naked eye.

- (A) Prokaryotic      **(B) Microscopic**      (C) Eukaryotic      (D) None of these
51. One  $\mu\text{m}$  is 0.000,001 meter or ..... of a metre.  
**(A)  $1 \times 10^{-6}$**       (B)  $1 \times 10^6$       (C)  $1 \times 10^7$       (D)  $1 \times 10^{-7}$
52. The process of taking in liquid material by cell membrane is called:  
(A) Rmpocytosis      (B) Phagocytosis      **(C) Pinocytosis**      (D) Exocytosis
53. Cell membrane is chemically composed of proteins:  
(A) 10 - 20 %      (B) 20 - 30 %      (C) 40 - 50 %      **(D) 60 - 80 %**
54. Cell membrane has 60 - 80 % :  
(A) Vitamins      (B) Carbohydrates      **(C) Proteins**      (D) Lipids
55. Lipid present in cell membranes:  
(A) 10 - 20 %      **(B) 20 - 40 %**      (C) 30 - 40 %      (D) None of these
56. The process of engulf solid particles is called:  
(A) Pinocytosis      (B) Exocytosis      (C) None of these      **(D) Phagocytosis**
57. The uphill movement of materials requires energy and is termed as:  
(A) Diffusion      (B) Passive transport      **(C) Active transport**      (D) Effusion
58. Cell wall is secreted by:  
(A) Nucleoplasm      **(B) Protoplasm**      (C) Golgi complex      (D) Ribosome
59. The primary cell wall is composed cellulose and some deposition of pectin and:  
**(A) Hemicellulose**      (B) Chitin      (C) Silica      (D) Lignin
60. Mitochondria also contain:  
(A) RNA and ribosomes      (B) DNA and RNA      **(C) DNA and ribosomes**      (D) DNA and protein
61. Plastids are present only in:  
(A) Virus      (B) Animal cell      (C) Bacteria      **(D) Plant cell**
62. Chloroplasts has a double membranous envelope that encloses dense fluid filled region known as:  
(A) Granum      (B) Matrix      **(C) Thylakiod**      (D) Stroma
63. The fluid which surrounds the thylakoids is called:  
(A) Nucloplams      **(B) Stroma**      (C) Matrix      (D) Cytoplasm
64. One of the following is organelle of symbiotic origin:  
(A) Golgi complex      (B) reticulum      (C) Endoplasmic      **(D) Chloroplast**
65. Stroma is a fluid in the chloroplast:  
(A) Matrix      (B) Granum      **(C) Thylakoids**      (D) Intergranum
66. Which of the following plastids are found in underground part of the plants?  
(A) Dividing cell      **(B) Non-dividing cell**      (C) Mature cell      (D) Germinating cell
67. Robert Brown reported the presence of:  
**(A) Nucleus**      (B) Mitochondria      (C) Ribosomes      (D) Lysosome

68. Nucleus can be seen in a:

- (A) Dividing cell      (B) Germinating cell      **(C) Non-dividing cell**      (D) Mature cell

69. Nucleus contains soluble sap called:

- (A) Nuclear sap      (B) Protoplasm      **(C) Nucleoplasm**      (D) Cytoplasm

70. The nuclear pores allow exchange of materials between the nucleus and the:

- (A) Cytosol      **(B) Cytoplasm**      (C) Nucleoplasm      (D) Protoplasm

71. Erthrocytes have only ..... pores per nucleus.

- (A) 5 or 6      (B) 4 or 5      (C) 2 or 4      **(D) 3 or 4**

72. Egg cell has about ..... pores per nucleus.

- (A) 3,000      (B) 35,000      **(C) 30,000**      (D) 25,000

73. Chimpanzee has the ..... number of chromosomes.

- (A) 64      **(B) 48**      (C) 46      (D) 44

74. Drosophila melanogaster is the biological name of:

- (A) Tsetse fly      **(B) Fruit fly**      (C) Housefly      (D) Butterfly

75. The number of chromosomes in normal body cells are:

- (A) Monoploid      **(B) Diploid**      (C) Triploid      (D) Haploid

### Fill in the blanks

Q1: In eukaryotic cell chromatin material is bounded by .....

Q2: A group of ribosomes attached to mRNA is known as .....

Q3: ..... is the place on chromosomes where spindle fibres are attached during Cell division.

Q4: The endoplasmic reticulum with attached ribosomes is known as .....

Q5: The soluble part of the cytoplasm is called .....

### Answers

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1. Nuclear membrane

2. Polysome

3. Centromere

4. Rough endoplasmic reticulum

5. Cytosol

Chapter : 04

The Cell

## Subjective

Q1: State salient features of cell theory.

Ans: The salient features of cell theory are:

- All organisms are composed of one or more cells.
- All cells arise from pre-existing cells.
- Cell is the basic structural as well as functional unit for all organisms.

Q2: **What are the basic components of cell?**

Ans: A cell consist of following basic components:

- Plasma membrane, also a cell wall in plant cell.
- Cytoplasm, containing cell organelles.
- Nucleus, with nuclear or chromatin material.

Q3: **What is the chemical composition of plasma membrane?**

Ans: Cell membrane is chemically composed of lipids and proteins, 60-80% are protein, while 20-40% are lipids. In addition there is a small quantity of carbohydrates.

Q4: **Differentiate between unit membrane and fluid mosaic model of membrane.**

Ans: **Unit Membrane:**

- It was proposed earlier by J.D. Robertson in 1959 that cell membranes is composed of lipid bi-layer sandwiched between inner and outer layers of protein. This basic structure is called the unit membrane and is present in all the cellular organelles.

**Fluid Mosaic Model:**

- The protein layers are not continuous and are not confined to the surface of the membrane but are embedded in lipid layers in a mosaic manner. This discovery which was given by S- Singer and Nicolson in 1972 led to the proposal of fluid mosaic model. This model at present is the most accepted one.

Q5: **What is the basic function of cell wall?**

Ans: Cell wall is very important. It provides a definite shape to cell and keeps it rigid. It does not act as a barrier to the materials passing through it.

Q6: **What is cytosol?**

Ans: The soluble part of the cytoplasm is called cytosol.

Q7: **What is the main function of cytoplasm?**

Ans: The main function of cytoplasm is to act as a store house of vital chemicals. Is is also a site for certain metabolic processes such as glycolysis.

Q8: **Who was the first person to study ribosomes?**

Ans: Palade (1955) was the first person to study them.

Q9: **What is polysome?**

Ans: A group of ribosomes attached to mRNA is known as polysome.

Q10: **Who first isolated lysosomes?**

Ans: These were isolated as a separate component for the first time by De Duve (1949).

Q11: **Who discovered Golgi apparatus?**

Ans: Golgi apparatus was discovered by Golgi in 1898.

Q12: **What are the functions of Golgi apparatus?**

Ans: Functions of Golgi Apparatus:

**Cell Secretions:**

- Golgi complex is concerned with cell secretions. Secretions are products formed within the cell on ribosomes and then passed to the outside through endoplasmic reticulum and Golgi apparatus. The secretions are converted into finished products and are packed inside membrane, before export. Exp: In mammals, the secrete granules containing enzymes that help in digestion. The Golgi complex has a role in information of these granules.

### **Transportation:**

- The proteins or enzymes which have to be transported out of the cell pass through the Golgi apparatus.

### **Modification of Proteins and Lipids:**

- The most important function of this apparatus is to modify the proteins and lipids by adding carbohydrates and converting them into glyco-proteins and glycolipids.

Q13: **What is autophagy? How it is beneficial for the cell?**

Ans: **Autophagy:**

- Self eating process of cell is called autophagy.

### **Benefits:**

- Lysosomes are also involved in the autpphagy. During this process some old, worn out parts of cell, such as old mitochondria are digested . In this way, materials of cell may be recycled and cell may be renewed. Their enzymes can also result in degeneration of cell, as may occur during some developmental processes. Lysosomes also release enzymes for extra cellular digestion.

Q14: **What are lysosomes? What is the main function of lysosomes?**

Ans: **Lysosomes:**

- Lysosomes are cytoplasmic organelles and are different from others due to their morphology. Lysosomes(Lyso = splitting, soma = body) are found in eukaryotic cells.

### **Function of Lysosomes:**

- Any foreign that gains entry into the cell is immediately engulfed by the lysosome and is completely broken into simple digestible pieces. The process is known as phagocytosis. They are most abundant in those animal cell which exhibit phagocytic activity. They are bounded by single membrane and are simple sacs rich in acid phosphatase and several other hydrolytic enzymes.

Q15: **Differentiate between primary lysosome and secondary lysosome.**

Ans: **Primary Lysosome:**

- The hydrolytic enzymes are synthesized on Rough Endoplasmic Reticulum and are future processed in the Golgi apparatus. These processed enzymes are budded off as Golgi vesicles and are called as primary lysosomes.

### **Secondary Lysosomes:**

- The phagocytic vacuoles fuse with the primary lysosomes to form digestive vacuoles. These digestive vacuoles and autophagosomes are known as secondary lysosomes.

Q16: **Differentiate between Gel and Sol.**

Ans: **Gel:**

- Viscous colloidal solution of cytoplasm is called gel. Peripheral parts of cell are gel like.

**Sol:**

- Non-viscous colloidal solution of cytoplasm is called sol. Central parts of cell are sol.

Q17: **What are storage disease?**

Ans: Several congenital disease have been found to be due to accumulation within the cell of substances such as glycogen or various glycolipids. These are also called storage disease and are produced by a mutation that effect one of the lysosomal enzymes involved in the catabolism of a certain substance.

Q18: **Who first isolated peroxisomes?**

Ans: De Duve and coworkers isolated in 1965 particles from liver and other tissues which were enriched with some oxidative enzymes, such as peroxidase, catalase, glycolic acid oxidase and some other enzymes.

Q19: **Briefly describe the structure of peroxisomes.**

Ans: These are single membrane enclosed endoplasmic organelle found both in animal and plants cells. These are characterized by containing H<sub>2</sub>O<sub>2</sub> producing oxidases and catalase. They are approximately 0.5 micro meter in diameter. They have also been found in protozoa, yeast and many cell types of higher plants.

Q20: **What is the function of peroxisomes?**

Ans: This organelle is specifically involved in the formation and decomposition of hydrogen peroxide in the cell.

Q21: **What are glyoxisomes?**

Ans: Plants contain an organelle, which in addition to glycolic acid oxidase and catalase, also possess a number of enzymes that are not found in animal cells. This organelle called glyoxisomes are most abundant in plant seedlings, which rely upon stored fatty acids to provide them with the energy and material to begin the formation of the cell.

Q22: **What is the basic function of vacuole?**

Ans: The plant vacuole is the major contributor to the turgor that provides support to the individual plant cell and contributes to the rigidity of the leaves and younger parts of the plant.

Q23: **What are the main proteins present in cytoskeleton?**

Ans: The main proteins that are present in cytoskeleton are tubulin actin, myosin, tropomyosin and others which are also found in muscles.

Q24: **What are the functions of centriole?**

Ans: Centrioles play an important part in the location of furrowing during cell division and in the formation of cilia.

Q25: **Justify that mitochondria is a self-replicating organelle.**

Ans: The presence of ribosomes and DNA indicates that some proteins are synthesized in them. It is a self-replicating organelle.

Q26: **What are F1 particles?**



Ans: The inner surface of cristae in the mitochondrial matrix has small knob like structure known as F1 particles.

Q27: **What are plastids?**

Ans: Membrane bounded, mostly pigment containing bodies present in the cell and are called plastids. Plastids are present in plant cells only.

Q28: **What is stroma and what is its function?**

Ans: **Stroma:**

- Stroma covers most of the volume of chloroplast. Stroma is a fluid which surrounds a thylakoids. It contains proteins, some ribosomes and a small circular DNA.

**Function of Stroma:**

- It is the part of the chloroplast where CO<sub>2</sub> is fixed to manufacture sugars. Some proteins are also synthesized in this part.

Q29: **Why granum appears green?**

Ans: On the layer of thylakoids, chlorophyll molecules are arranged and that is why granum appears to be green.

Q30: **What is intergranum?**

Ans: Each granum is inter connected with others by the non-green part called intergranum.

Q31: **What are the functions of chromoplast?**

Ans: They impart colors to the plant other than green. They are present in the petal of the flower and in the ripened fruit. They help in the pollination and dispersal of seed.

Q32: **What are leucoplasts? What is its function?**

Ans: **Leucoplasts:**

- They are colorless. They are triangular, tubular or of some other shape.

**Function:**

- They are found in the underground parts of the plant and store food.

Q33: **How nuclear pores are formed? What is its function?**

Ans: The outer and inner membranes are continuous at certain points resulting in the formation of pores, the nuclear pores. The nuclear pores allow the exchange of materials between the nucleus and the cytoplasm.

Q34: **What is the function of chromosomes?**

Ans: All the information necessary to control the activities of the cell is located on the chromosomes in the form of genes, which are transferred from one generation to the other. The number of chromosomes in all individuals of the same species remains constant generation after generation.

Q35: **What are the functions of glyoxysomes?**

Ans: **1.** One of the primary activities in these germinating seedlings is the conversion of stored fatty acids to carbohydrates. This is achieved through a cycle, glyoxlate cycle, the enzymes of which are located in the glyoxysomes and the process is called gluconeogenesis.

**2.** Glyoxysomes are the sites for breakdown of fatty acids to succinate.

Q36: **What is the difference between thylakoids and grana?**

Ans: **Thylakoids:**

- Thylakoids are flattened vesicles which arrange themselves to form grana and intergrana.

### **Grana:**

- A granum appears to be a pile of thylakoids stacked on each other like coins. On an average, there are 50 or more thylakoids piled to form one granum. Membranes of the gran are sites where sunlight energy is trapped and where ATP is formed.

Q37: **What is nucleolus? What is its function?**

Ans: **Nucleolus:**

- It is darkly stained body within the nucleus, and is without any membranes to separate it from the rest of the nuclear material.

They are composed of two regions:

- The peripheral granular area composed of precursors of ribosomal subunits.
- The central fibril area consisting of large molecules weight RNA and rDNA.

Q38: **Why mitochondria is called power house of the cell?**

Ans: Mitochondria extract energy from different components of food and convert it in form of ATP. This energy is used for various cellular activities. The spent energy in form of ADP is regenerated by mitochondria into ATP. As mitochondria are involved in manufacture and supply of energy to the cell. So they are called power house of the cell.

Q39: **What is Tay Sach's disease?**

Ans: Tay Sach's disease is because of absence of Hexoseaminidase enzyme that is involved in the catabolism of lipids. Accumulation of lipids in brain cells lead to mental retardation and even death.

Q40: **Differentiate between Microtubules, Microfilaments and intermediate filaments.**

Ans: **Microtubules:**

- They are long, unbranched, slender proteins structures.

### **Functions:**

- Several cell organelles are derived from special assemblies of microtubules for e.g., cilia, flagella, basal bodies and centrioles. Assembly and dis-assembly of spindle structure during mitosis.

### **Microfilaments:**

- These are considerably more slender cylinders made up of contractile actin protein, linked to the inner surface of plasma membrane.

### **Functions:**

- They are involved in the internal cell motion like movement of cyclosis and amoeboid movements.

### **Intermediate Filaments:**

- They have diameter in between those of Microtubules and Microfilaments.

### **Functions:**

- They are involved in maintenance of cell shape and integration of cellular compartments.

Q41: **What is the difference between chlorophyll and hemoglobin?**

Ans: **Chlorophyll:**

- Chlorophyll has Mg<sup>+2</sup> as the central atom in its molecule.

### **Haemoglobin:**

- Haemoglobin has Fe<sup>+2</sup> as the central atom in its molecule.

Q42: **What is the difference between chromatids and chromosomes?**

Ans: **Chromosomes:**

- Chromosomes are thread like structures consisting of chromatids and centromere.

**Chromatids:**

- Chromatids is exact replica of the chromosome.

Q43: **Briefly describe the structure of cell wall of plant cells.**

Ans: The outer most boundary in most of the plant cells is called cell wall. It is secreted by the protoplasm of the cell and consists of :

**Primary Wall:**

- The primary wall is composed of cellulose deposition of pectin and hemicelluloses. It is true wall and develops into newly growing cells.

**Secondary Wall:**

- It is formed on the inner surface and is completely thick and rigid. It is composed of silica, waxes, cutin, lignin, etc. Middle Lamella: It is formed in between primary walls of the neighboring cells.

Q44: **Differentiate between phagocytosis and pinocytosis.**

Ans: **Phagocytosis:**

- The cell membrane helps to take in or engulf solid particles by enfolding in the form of vacuoles.

**Pinocytosis:**

- The cell membrane helps to take in or engulf liquid particles by enfolding in the form of vacuoles.

Q45: **What are the basic functions performed by plasma membrane?**

Ans: **Transport of Materials:**

- Cell membrane offers a barrier between the cell contents and their surroundings, allowing only selective substances to pass through like lipid soluble substance, glucose, small gas molecules and water can pass through while ions cannot.

**Endocytosis:**

- In many animal cells, the cell membranes helps to take in materials by enfolding in the form of vacuoles. This can either be phagocytosis or pinocytosis.

**Transport Nerve Impulses:**

- In neuron the cell membrane transmits nerve impulses from one part of the body to another to keep coordination.

Q46: **Differentiate between active and passive transport.**

Ans: **Passive Transport:**

- The substances from the area of high concentration to the area of low concentration. It does not require energy.

**Active Transport:**

- The substances move from the area of low concentration to the area of the high concentration. It is uphill movement which requires energy.

Q47: **Describe different types of functions performed by animal and plant cells.**

Ans: **Animal Cells:**

- **Muscle Cells:** They contract and relax.
- **Nerve Cells:** They transmit impulses.
- **Gland Cells:** They secrete their secretions.
- **Red Blood Cells:** They carry oxygen.
- **White Blood Cells:** They defend the body against pathogens.
- **Stomach Cells:** They secrete gastric juice.

### **Plant Cells:**

- **Xylem Cells:** They conduct water and mineral salts from soil to the aerial parts of the plant.
- **Phloem Cells:** They trans-locate food.
- **Sclerenchymatous Cells:** They give support to plants.
- **Collenchymatous Cells:** They give support to young plants.
- **Chlorenchymatous Cells:** They carry out photosynthesis.
- **Parechymatous Cells:** They store surplus food.
- **Meristematic Cells:** They produce new cells for growth and development of the plant.

Q48: **How nuclear pores are formed? What is its function?**

Ans:	<b>Animal Cells</b>	<b>Plant cells</b>
➤	Nucleus is central	Nucleus is peripheral.
➤	Small sized vacuole.	Large vacuole present in center.
➤	No cell wall.	Cell wall present.
➤	Chloroplast absent	Chloroplast present.

Q49: **Differentiate between Prokaryotic and Eukaryotic cell.**

Ans: **Prokaryotic Cell:**

- No well defined nucleus.
- Nuclear material DNA and chromosomes and are directly submerged in cytoplasm without nuclear covering.
- Organisms possessing prokaryotic cell are called prokaryotes.
- They lack many of the membrane bounded organelles like mitochondria, endoplasmic reticulum, chloroplasts, Golgi apparatus.
- Prokaryotes have small sized ribosomes.
- Prokaryotic cell has cell wall composed of polysaccharides chains bounded covalently to shorter chains of amino acids forming peptidoglycan or murein. The cell wall is regarded as sacculus.

### **Eukaryotic Cell:**

- They have well defined nucleus.
- Nuclear material DNA and chromosomes are enclosed in double nuclear membrane.
- Organisms possessing eukaryotic cells are called eukaryote.
- Eukaryotic cells are rich in membrane bounded organelles. They possess mitochondria, endoplasmic reticulum, chloroplast and Golgi apparatus.
- Eukaryotes have large sized ribosomes.
- Eukaryotic cells have cellulose in their cell wall.

Q50: **Differentiate between Rough Endoplasmic Reticulum and Smooth Endoplasmic Reticulum.**

Ans: **Rough Endoplasmic Reticulum:**

- Rough Endoplasmic Reticulum is marked by the presence of ribosomes on its membranes.
- It is involved in the synthesis of protein.

**Smooth Endoplasmic Reticulum:**

- Smooth Endoplasmic Reticulum is without ribosomes.
- It helps in the metabolism of lipids and other molecules. They also detoxify harmful drugs. They also transmit impulses. They are also involved in the transport of materials from one cell to another.

Q51: **Is there any similarity between bacterial and plant cell wall?**

Ans: **No**, Peptidoglycan found in bacterial cell wall and cellulose found in plant cell wall are carbohydrates.

Q52: **How does autophagy help in converting a tadpole larva into an adult amphibian?**

Ans: Autophagy is involved in breakdown of cell organelles of tail of tadpole larva. Autophagy is followed by autolysis by which cell is destroyed. In this way tail would disappear.

Q53: **What will happen if a chromosome loses its centromere?**

Ans: The loss of centromere will cause:

- A change in the physical composition.
- Separation of chromosome.
- Degeneration of chromosome,

Q54: **List the processes blocked by mitochondrial failure in a cell.**

Ans: Process blocked by mitochondrial failure in a cell.

- Krebs cycle.
- Electron transport chain.
- Fatty acid metabolism.

Q55: **State various structural modifications in a cell involved in secretion.**

Ans: Secretions are the products produced within the cell on ribosomes and then passed to the outside through endoplasmic reticulum and golgi apparatus. The secretions are converted into finished product and are packed inside membrane, before export.

Q56: **Describe various movements involved in the transport of materials across cell membrane.**

Ans: **Movements involved in the transport of materials:**

- Cell membrane plays an important role in the movement of materials from and to the cell. There are two main processes which are involved in the transport of materials:

**Non-facilitated Transport:**

- Non Polar molecules like oil droplets, phospholipids, fatty acids etc., move across the membrane freely through the lipid bi-layer. This is called non-facilitated transport.

**Facilitated Transport:**

- The movement of ionic materials like water molecules oxygen carbon dioxide or radicals is carried out across the cell membrane only with the help of proteins. So it is called facilitated transport. There are two types of facilitated transport.

### **Active Transport:**

- The transport of molecules across the membrane against concentration gradient with the expenditure of energy is called active transport.

### **Passive Transport:**

- The transport of molecules across the membrane along concentration gradient without utilizing energy is called passive transport. There are two types of passive transport.

### **Diffusion:**

- Soluble materials are in constant motion and moves from an area of higher concentration to an area of lower concentration across the membranes by a process called diffusion.

### **Osmosis:**

- The movement of water molecules from an area of its higher concentration to an area of lower concentration through differentially permeable membrane is called osmosis.

### **Exocytosis:**

- If the transportation takes place from the cell to the exterior or to the other cells then such a process is known as exocytosis. By exocytosis either the waste products or secretions move across the membrane.

### **Endocytosis:**

- The inward movement of the materials by infolding of the cell membrane in the form of vacuole or vesicle is known as endocytosis. There are two types of endocytosis.

### **Phagocytosis:**

- If the large solid particles are taken in then such a process is called phagocytosis.

### **Pinocytosis:**

- The ingestion of liquid materials into the cell is called pinocytosis.

Q57: **Describe the emergence and implication of cell theory.**

Ans: **Robert Hook:** Was the first who discovered and named the cell, by studying a thin section of cork. Published the report in "Micrographia". He stated, cell is an empty space bounded by thick wall.

**Lorenz Oken:** Believed "all living beings originate from or consist of vesicles or cells".

**Jean Baptist de-Lamarck:** Expressed no body can have life if its constituent parts are not cellular tissue or formed by cellular tissue.

**Robert Brown:** Reported the presence of nucleus, thus changed the ideas about the cell being an empty space.

**Theodor Schwann and Schleiden:** Presented cell theory.

**Rudolph Virchow:** Opposed the ideas of abiogenesis and hypothesized, "omnis cellula e cellula", new cells are formed only by division of previously existing living cells.

**Louis Pasteur:** Provided experimental proof for Virchow's hypothesis by demonstrating that micro-organisms could be formed only from existing bacteria.

**August Weismann:** Stated "all presently living cells have a common origin because they have basic similarities in structure and molecules".

Q58: **Differentiate between Cristae and Cisternae.**

Ans: **Cristae:**

- The inner membrane of mitochondria forms infolding into chamber or matrix. These infolds are called cristae.

**Cisternae:**

- The material present in Endoplasmic reticulum and Golgi apparatus is separated from the cytoplasmic materials by structures that are spherical or tubular membranes called cisternae.

## Chapter : 04

## The Cell

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### Imp. Long Questions

- Q1: Describe Fluid Mosaic Model and functions of plasma membrane. (V.imp)
- Q2: Describe structure and functions of plasma membrane.
- Q3: Explain structure and function of Golgi apparatus. (V.imp)
- Q4: Write a note on cell wall.
- Q5: Explain the structure and functions of lysosomes. (V.imp)
- Q6: Write a note on Endoplasmic Reticulum.
- Q7: What are Lysosomes? Give their functions. (V.imp)
- Q8: What are peroxisomes and its functions?
- Q9: What are glyoxisomes? Give their function and structure. (V.imp)
- Q10: Write a note on cytoskeleton.
- Q11: Give an account of structure and function of mitochondria.
- Q12: Write a note on Mitochondria. (V.imp)
- Q13: What are plastids? Discuss their structure and role.
- Q14: What are plastids? Discuss the chloroplast in detail.
- Q15: Write a detailed note on chromosomes.
- Q16: Differentiate between prokaryotic and eukaryotic cell. (V.imp)