

The Fundamental unit of life

Very short answer type Question

1. Who gave cell theory?
2. Who constructed the prototype of electron microscope?
3. What is diffusion?
4. Which term is given to the Golgi apparatus found in plant cells?
5. What are suicide bags?
6. What is the full form of ATP?
7. Which organelle is called power house of the cell?
8. Name two types of plastids?
9. What are Palade particles?
10. How is polysome formed?
11. What is the main function of contractile vacuole?
12. What is the microtubular arrangement in centriole?

Short answer type Question

1. Why a cell is considered as basic structural and functional unit of an organism?
2. What will happen to a cell if it is placed in a hypotonic solution?
3. Differentiate between Semipermeable membrane and Selectively permeable membrane.
4. How *Amoeba* obtains its food?
5. What are the functions of cell wall?
6. Why nucleus is called "Director of cell"?
7. Differentiate between Rough Endoplasmic Reticulum (RER) and Smooth Endoplasmic Reticulum (SER)?
8. Why golgi body is called Factory of cell secretion?
9. How macrophages show phagocytosis?
10. Why mitochondria and plastids are called semi-autonomous organelles?
11. What are the differences between 70 S and 80 S ribosomes?
12. How does facilitated diffusion occurs across the membrane?

Long answer type questions

1. Discuss the main components of cell membrane as per Fluid Mosaic Model.
2. Discuss the three layers of cell wall.
3. Discuss the structure of nucleus. What is the role of nuclear membrane and nucleolus?

4. Explain the structure of mitochondria with the help of well labelled diagram.
5. Differentiate between plant cell and animal cell with diagram.

True/False questions

State whether the following statements are true or false.

1. Largest known cell is ostrich egg.
2. Robert Brown discovered the nucleus.
3. The plasma membrane has inelastic structure.
4. Ingestion of solid food particles is called phagocytosis.
5. ATP is required for active transport.
6. Fluid mosaic model was proposed by Singer and Nicolson in 1872.
7. Retting of fibres is due to partial solubilisation of pectin present in middle lamella.
8. Chromosomes are made up of DNA and proteins.
9. Membrane bound organelles can be seen in eukaryotic cells.
10. Viruses are nucleoprotein entities.
11. Endoplasmic reticulum helps in membrane biogenesis.
12. The convex face of golgi cisternae is towards cell membrane.
13. Mitochondria are present in all eukaryotic cells.
14. Chloroplast contains 80 S ribosomes and circular DNA.
15. Ribosomes are made up of RNA and proteins.
16. Vacuole is bounded by impermeable tonoplast.
17. Centriole is called is control room of the cell.
18. Two centrioles are present perpendicular to each other.
19. Centrioles help in cell division in animal cells.
20. Phagocytosis does not occur in plant cells.

Fill in the blanks

1. _____ and _____ proposed cell theory.
2. _____ is the longest cell in the human body.
3. _____ discovered free living cells in pond water.
4. Hematoxylin is used to stain _____.
5. A compound microscope can magnify an object maximum upto _____ times.
6. Cell membrane is _____ permeable.
7. Membrane protein are classified into two types _____ and _____ on the basis of ease of extraction.

8. The membrane which allows the diffusion of both solvent and solute molecules through it is called _____.
9. Egg shell is made up of _____.
10. Middle lamella is made up of _____.
11. Functional segments of DNA are called _____.
12. SER is the major site for the synthesis of _____.
13. Golgi body was discovered by _____.
14. Cellular house keepers of a cell are _____.
15. _____ and _____ cell organelles have their own DNA.
16. Coloured plastids are called _____.
17. 70 S ribosomes are made up of two sub units that is _____ and _____.
18. Svedberg's unit is indirectly a measure of _____ and _____.
19. Sap vacuoles can occupy _____ percent of volume of plant cell.
20. Basal bodies can give rise to _____ and _____.

Objective type questions

In the following questions, four options are given out of which only one is correct.

1. Which of the following statement incorrect?
 - (1) The shape and size of cells in human body is related to the functions they perform
 - (2) Nerve cells are longest cells in human body
 - (3) White blood cells have a fixed shape
 - (4) Leaf peels contain abundant chloroplasts
2. The longest cell in human body is
 - (1) Neuron
 - (2) Muscle fibre
 - (3) Epithelial cell
 - (4) Bone cell
3. Which of the following cell in human body lacks nucleus?
 - (1) WBC
 - (2) Mature RBC
 - (3) Platelets
 - (4) Nerve cells
4. Which of the following set represent example of unicellular organisms?
 - (1) *Chlamydomonas*, plants
 - (2) *Euglena*, animals
 - (3) *Paramecium*, *Amoeba*
 - (4) *Bacteria*, *Rhizopus*
5. The statement "Cells arise from pre-existing cells" was given by
 - (1) Ernst Ruska
 - (2) Schleiden
 - (3) Robert Brown
 - (4) Virchow
6. Which of the following scientist discovered cell while observing thin slices of cork?
 - (1) Virchow
 - (2) Purkinje
 - (3) Leewenhoek
 - (4) Robert Hooke

7. Find correct match

	Scientist	Discovery	Year
(1)	Robert brown	Nucleus	1851
(2)	Purkinje	Free living cells	1839
(3)	Schleiden	Omnis cellula-e-cellula	1831
(4)	Robert Hooke	Cell	1665

8. Cell organelles are secondarily lost in
 - (1) Nerve cells
 - (2) WBCs
 - (3) Smooth muscle cells
 - (4) Mature mammalian RBCs
9. Which of the following stain is not used for staining nucleus?
 - (1) Eosin
 - (2) Hematoxylin
 - (3) Methylene blue
 - (4) Saffranin
10. The term "protoplasm" for the fluid substance of the cell, was given by
 - (1) Robert Hooke
 - (2) Robert Brown
 - (3) Purkinje
 - (4) Flemming
11. How many of following feature are applicable for cell membrane?
 - a. selectively permeable
 - b. quasi fluid
 - c. trilaminar
 - d. lipoproteinaceous
 - e. impermeable
 - f. inelastic
 - (1) five
 - (2) four
 - (3) six
 - (4) three
12. Fluid mosaic model to study the structure of cell membrane was proposed by
 - (1) Max knoll
 - (2) Ruska
 - (3) Singer and Nicolson
 - (4) Fleming
13. In the membrane, the arrangement of lipids is
 - (1) Hydrophobic tails outwards
 - (2) Hydrophilic heads inwards
 - (3) hydrophobic heads outwards
 - (4) Hydrophobic tails inwards
14. Dynamic nature of membrane is due to (x) while fluid nature of membrane is due to (y). (x) and (y) respectively are
 - (1) proteins, lipids
 - (2) lipids, proteins
 - (3) proteins, carbohydrates
 - (4) carbohydrates lipids
15. The membrane which allows the diffusion of solvent only but do not allow the passage of solute molecule is considered as
 - (1) permeable
 - (2) semi permeable
 - (3) selectively permeable
 - (4) differentially permeable

16. What will happen if human RBC is kept in hypotonic solution?
 (1) burst (2) shrink
 (3) swell (4) remains same
17. If a de-shelled egg is placed in a concentrated salt solution and observed after 5 minutes it will
 (1) swell (2) shrink
 (3) remain as such (4) dissolve
18. In which of the following process, special proteins help movement of substances across the membranes without expenditure of ATP?
 (1) Simple diffusion (2) Osmosis
 (3) Facilitated diffusion (4) Active transport
19. The proteins which lie on the surface of membrane are called
 (1) extrinsic proteins (2) intrinsic proteins
 (3) peripheral proteins (4) integral proteins
20. The outermost layer of cell wall is
 (1) middle lamella
 (2) secondary wall
 (3) primary wall
 (4) made up of cellulose microfibrils
21. Softening of ripe fruits is due to
 (1) degeneration of cell walls
 (2) degeneration of middle lamella
 (3) complete hydrolysis of hemicellulose
 (4) partial solubilisation of pectin in middle lamella
22. Which of the following is called control room of the cell?
 (1) Nucleus (2) Mitochondria
 (3) Ribosomes (4) Plasma membrane
23. Which of the following is not a component of nucleus?
 (1) Chromatin (2) Centrosome
 (3) Nucleolus (4) Nucleoplasm
24. Nuclear membrane surrounding the nucleus
 (1) is porous
 (2) is double
 (3) forms barrier between nucleus and cytoplasm
 (4) all of above
25. Which of the following is the site for formation and storage of rRNA?
 (1) Nucleus (2) Nucleolus
 (3) Golgi body (4) Mitochondria
26. Which of the following is a correct difference between a prokaryotic cells and eukaryotic cell?

	Feature	Prokaryotic cell	Eukaryotic cell
(1)	Chromosome	many	single
(2)	Ribosome	70S, 80S	70S
(3)	Nucleolus	absent	present
(4)	Organelles	present	absent

27. Which of the following organelle is not a part of endomembrane system?
 (1) Endoplasmic reticulum
 (2) Golgi complex
 (3) Mitochondria
 (4) Lysosomes
28. Find incorrect match
 (1) Nucleus – Director of cell
 (2) Ribosome – Protein synthesis
 (3) SER – Lipid synthesis
 (4) Golgi body – rRNA synthesis
29. Which of the following organelle is called 'Factory of cell secretion'?
 (1) Ribosome (2) Lysosome
 (3) Golgi body (4) Nucleus
30. How many of the following functions are performed by Golgi body?
 a. Packaging of materials
 b. Transformation of membranes
 c. Formation of lysosome
 d. Protein modifications
 e. Ribosome formation
 (1) five (2) four
 (3) three (4) two
31. 'Suicide bags' of a cell are
 (1) mitochondria (2) ribosomes
 (3) lysosomes (4) plastids
32. Membrane bound sacs filled with digestive enzymes are
 (1) Golgi bodies (2) Lysosomes
 (3) Ribosomes (4) Vacuoles
33. Which of the following organelle is not enclosed by double membrane?
 (1) Mitochondrion (2) Chloroplast
 (3) Nucleus (4) Lysosome
34. Lysosomes contain enzymes for the digestion of
 (1) carbohydrates (2) proteins
 (3) fats (4) all the above
35. The digestive enzymes of lysosomes are made by
 (1) rough endoplasmic reticulum
 (2) smooth endoplasmic reticulum
 (3) golgi body
 (4) mitochondria
36. Which one of the following structure/organelle is present in both plant and animal cell?
 (1) Mitochondria (2) Chloroplast
 (3) Centriole (4) Cell wall
37. Which of the following statement(s) is/are correct w.r.t. mitochondria?
 (1) Outer porous membrane
 (2) Inner membrane forms crista
 (3) Crista bear elementary particles associated with ATP production
 (4) All of above

38. Which of the following set represents double membrane bound organelles?
- (1) Vacuole, Lysosome
 - (2) Mitochondria, Plastids
 - (3) Nucleus, Plastids
 - (4) Both (2) & (3)
39. Which of the following is correct for the organelle called kitchen of cell?
- (1) Double membrane bound
 - (2) Site of photosynthesis
 - (3) Mainly found in mesophyll cells of leaves
 - (4) All of the above
40. In a eukaryotic cell DNA can be found in
- (1) nucleus, mitochondria and plastid
 - (2) centrosome, mitochondria and Golgi body
 - (3) nucleolus, Golgi body and diplosome
 - (4) lysosome, Golgi body and plastid
41. Which of the following is incorrect match?
- (1) Chromoplast – Coloured plastids
 - (2) Leucoplasts – White plastids
 - (3) Chloroplasts – Can change to chromoplast
 - (4) Leucoplast – Can change to chloroplast
42. How many of the following are present in the stroma of chloroplast?
Proteins, Lipids, Metal ions, Circular DNA, 80 S ribosomes
- (1) 5
 - (2) 4
 - (3) 3
 - (4) 2
43. Which of the following statement is incorrect?
- (1) Chromoplast add colour to fruits and flowers to attract animals for pollination and seed dispersed
 - (2) In chloroplast lamellae are arranged in stacks called grana
 - (3) Leucoplasts are mainly responsible for storing starch, oils and protein granules
 - (4) Stroma of chloroplast is coloured containing linear DNA
44. Smallest non membrane bound organelle is
- (1) Vacuole
 - (2) Ribosome
 - (3) Lysosome
 - (4) Nucleolus
45. 'Universal cell organelle' is
- (1) Mitochondria
 - (2) Ribosome
 - (3) Plastid
 - (4) Nucleus
46. 70 S ribosomes are not present in
- (1) prokaryotic cells
 - (2) mitochondria
 - (3) plastids
 - (4) cytoplasm of eukaryotic cells
47. Which of the following plays important role in binding of two subunits of ribosomes?
- (1) Ca^{2+}
 - (2) Mg^{2+}
 - (3) Fe^{2+}
 - (4) Cu^{2+}
48. Each ribosome is made up of
- (1) 4 unequal subunits
 - (2) 2 equal subunits
 - (3) 2 unequal subunits
 - (4) 4 equal subunits
49. 70 S ribosomes are made up of
- (1) 50 S + 30 S
 - (2) 60 S + 40 S
 - (3) 40 S + 50 S
 - (4) 50 S + 60 S
50. Which of the following is 'an organelle within an organelle'?
- (1) Mitochondria
 - (2) Ribosome
 - (3) Centrosome
 - (4) Plastids
51. Ribosomes are made up of
- (1) RNA
 - (2) proteins
 - (3) deoxyribonucleic acid
 - (4) both (1) & (2)
52. Protein factory of a cell is
- (1) lysosome
 - (2) nucleus
 - (3) centrosome
 - (4) ribosome
53. Find incorrect match
- (1) Mitochondria – powerhouse of cell
 - (2) ATP – Energy currency of cell
 - (3) Ribosomes – Palade particles
 - (4) Vacuoles – Semi autonomous
54. 'Waste deposit bin' is
- (1) sap vacuole
 - (2) food vacuole
 - (3) contractive vacuole
 - (4) lysosome
55. The membrane surrounding the vacuole of a plant cell is called
- (1) Tonoplast
 - (2) Plasma membrane
 - (3) Cell membrane
 - (4) Cell wall
56. Non membrane bound organelle having cart wheel like appearance is
- (1) Ribosome
 - (2) centriole
 - (3) nucleolus
 - (4) vacuole
57. Number of radial spokes in centriole is
- (1) 9
 - (2) 14
 - (3) 18
 - (4) 21
58. Basal bodies are formed from
- (1) cilia
 - (2) flagella
 - (3) centriole
 - (4) peroxisome
59. Centrioles are associated with
- (1) Protein synthesis
 - (2) Cell division
 - (3) Lipid synthesis
 - (4) Respiration
60. The two centrioles of a diplosome are present
- (1) parallel to each other
 - (2) perpendicular to each other
 - (3) at an oblique angle
 - (4) horizontally

61. How many of the following are single membrane bound organelles?
Nucleus, Endoplasmic reticulum, Lysosome, Golgi body, Mitochondria, Plastids, Ribosome, Vacuole, Centrosome, Nucleolus
(1) 5 (2) 3
(3) 4 (4) 6
62. A plant cell differs from an animal cell in having
(1) ER (2) Cell wall
(3) Ribosomes (4) Cell membrane.
63. Which of the following is the largest organelle in mature plant cell?
(1) Nucleus
(2) Mitochondria
(3) Endoplasmic reticulum
(4) Vacuole
64. Reserve food in plants is
(1) glycogen (2) starch
(3) chitin (4) cellulose

Answers

- | | | |
|-----------------------------------|---------------------------------|---------|
| Fill in the blanks | | |
| 1. Schleiden and Schwann | 6. False | 11. (2) |
| 2. Neurons | 7. True | 12. (3) |
| 3. Anton von leeuwenhoek | 8. True | 13. (4) |
| 4. Nucleus | 9. True | 14. (1) |
| 5. 1000 x | 10. True | 15. (2) |
| 6. Selectively permeable | 11. True | 16. (1) |
| 7. Intrinsic and extrinsic | 12. False | 17. (2) |
| 8. Permeable membrane | 13. False | 18. (3) |
| 9. Calcium carbonate | 14. False | 19. (1) |
| 10. Pectin | 15. True | 20. (1) |
| 11. Gene | 16. False | 21. (4) |
| 12. Lipids | 17. False | 22. (1) |
| 13. Camilo golgi | 18. True | 23. (2) |
| 14. Lysosome | 19. True | 24. (4) |
| 15. Mitochondria and chloroplast | 20. True | 25. (2) |
| 16. Chromoplast | | 26. (3) |
| 17. 50 S and 30 S | Objective type questions | 27. (3) |
| 18. Density and size of ribosomes | 1. (3) | 28. (4) |
| 19. 50% - 90% | 2. (1) | 29. (3) |
| 20. Cilia and flagella | 3. (2) | 30. (2) |
| | 4. (3) | 31. (3) |
| | 5. (4) | 32. (2) |
| True/False | 6. (4) | 33. (4) |
| 1. True | 7. (4) | 34. (4) |
| 2. True | 8. (4) | 35. (1) |
| 3. False | 9. (1) | 36. (1) |
| 4. True | 10. (3) | 37. (4) |
| 5. True | | 38. (4) |
| | | 39. (4) |
| | | 40. (1) |
| | | 41. (4) |
| | | 42. (2) |
| | | 43. (4) |
| | | 44. (2) |
| | | 45. (2) |
| | | 46. (4) |
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| | | 48. (3) |
| | | 49. (1) |
| | | 50. (2) |
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| | | 62. (2) |
| | | 63. (4) |
| | | 64. (2) |