

# Cell- The Unit of Life

## 8.1 What is a Cell?

1. A major breakthrough in the studies of cells came with the development of electron microscope. This is because

- (a) the electron microscope is more powerful than the light microscope as it uses a beam of electrons which has wavelength much longer than that of photons
- (b) the resolving power of the electron microscope is much higher than that of the light microscope
- (c) the resolving power of the electron microscope is 200 - 350 nm as compared to 0.1 - 0.2 nm for the light microscope
- (d) electron beam can pass through thick materials, whereas light microscopy requires thin sections.

(2006)

2. A student wishes to study the cell structure under a light microscope having 10X eyepiece and 45X objective. He should illuminate the object by which one of the following colours of light so as to get the best possible resolution?

- (a) Blue (b) Green
- (c) Yellow (d) Red

(2005)

3. Electron microscope has a high resolution power. This is due to
- (a) electromagnetic lenses
  - (b) very low wavelength of electron beam
  - (c) low wavelength of light source used
  - (d) high numerical aperture of glass lenses used.

(1992, 1990)

4. Magnification of compound microscope is not connected with
- (a) numerical aperture
  - (b) focal length of objective
  - (c) focal length of eye piece
  - (d) tube length.

(1990)

## 8.2 Cell Theory

5. The concept of “Omnis cellula-e-cellula” regarding cell division was first proposed by

- (a) Aristotle
- (b) Rudolf Virchow
- (c) Theodore Schwann
- (d) Schleiden.

(NEET 2019)

6. Which is correct about cell theory in view of current status of our knowledge about cell structure?

- (a) It needs modification due to discovery of subcellular structures like chloroplasts and mitochondria.
- (b) Modified cell theory means that all living being are composed of cells capable of reproducing.
- (c) Cell theory does not hold good because all living beings (e.g., viruses) do not have cellular organisation.
- (d) Cell theory means that all living objects consists of cells whether or not capable of reproducing.

(1993)

7. Names of Schleiden and Schwann are associated with

- (a) protoplasm as the physical basis of life
- (b) cell theory
- (c) theory of cell lineage
- (d) nucleus functions as control centre of cell.

(1993)

## 8.3 An Overview of Cell

8. Angstrom ( $\text{\AA}$ ) is equal to

- (a) 0.01 mm (b) 0.001 mm
- (c) 0.0001 mm (d) 0.00001 mm.

(1992)

9. Organelles can be separated from cell homogenate through

- (a) chromatography (b) X-rays diffraction
- (c) differential centrifugation (d) auto-radiography.

(1989)

## 8.4 Prokaryotic Cells

10. Which of the following statements about inclusion bodies is incorrect?

- (a) They are not bound by any membrane.
- (b) These are involved in ingestion of food particles.
- (c) They lie free in the cytoplasm.
- (d) These represent reserve material in cytoplasm.

(NEET 2020)

## 8.5 Eukaryotic Cells

- 28.** Which of the following is true for nucleolus?  
 (a) Larger nucleoli are present in dividing cells.  
 (b) It is a membrane-bound structure.  
 (c) It takes part in spindle formation.  
 (d) It is a site for active ribosomal RNA synthesis.  
 (NEET 2018)
- 29.** The Golgi complex participates in  
 (a) fatty acid breakdown  
 (b) formation of secretory vesicles  
 (c) respiration in bacteria  
 (d) activation of amino acid. (NEET 2018)
- 30.** Which of the following events does not occur in rough endoplasmic reticulum?  
 (a) Protein folding (b) Protein glycosylation  
 (c) Cleavage of signal peptide  
 (d) Phospholipid synthesis (NEET 2018)
- 31.** Select the incorrect match.  
 (a) Lampbrush – Diplotene bivalents chromosomes  
 (b) Allosomes – Sex chromosomes  
 (c) Sub-metacentric – L-shaped chromosomes  
 (d) Polytene – Oocytes of amphibians (NEET 2018)
- 32.** Which of the following cell organelles is responsible for extracting energy from carbohydrates to form ATP?  
 (a) Ribosome (b) Chloroplast  
 (c) Mitochondrion (d) Lysosome (NEET 2017)
- 33.** Select the mismatch.  
 (a) Gas vacuoles – Green bacteria  
 (b) Large central vacuoles – Animal cells  
 (c) Protists – Eukaryotes  
 (d) Methanogens – Prokaryotes (NEET-II 2016)
- 34.** A cell organelle containing hydrolytic enzymes is  
 (a) lysosome (b) microsome  
 (c) ribosome (d) mesosome. (NEET-II 2016)
- 35.** Mitochondria and chloroplast are  
 (A) semi-autonomous organelles  
 (B) formed by division of pre-existing organelles and they contain DNA but lack protein synthesising machinery.  
 Which one of the following options is correct?  
 (a) (A) is true but (B) is false.  
 (b) Both (A) and (B) are false.  
 (c) Both (A) and (B) are correct.  
 (d) (B) is true but (A) is false. (NEET-I 2016)
- 36.** Microtubules are the constituents of  
 (a) centrioles, spindle fibres and chromatin  
 (b) centrosome, nucleosome and centrioles  
 (c) cilia, flagella and peroxisomes  
 (d) spindle fibres, centrioles and cilia. (NEET-I 2016)
- 37.** Which one of the following cell organelles is enclosed by a single membrane?  
 (a) Lysosomes (b) Nuclei  
 (c) Mitochondria (d) Chloroplasts (NEET-I 2016)
- 38.** Water soluble pigments found in plant cell vacuoles are  
 (a) carotenoids (b) anthocyanins  
 (c) xanthophylls (d) chlorophylls. (NEET-I 2016)
- 39.** Match the columns and identify the correct option.  

<b>Column I</b>	<b>Column II</b>
A. Thylakoids	(i) Disc-shaped sacs in Golgi apparatus
B. Cristae	(ii) Condensed structure of DNA
C. Cisternae	(iii) Flat membranous sacs in stroma
D. Chromatin	(iv) Infoldings in mitochondria

  
 (a) A-(iii), B-(i), C-(iv), D-(ii)  
 (b) A-(iii), B-(iv), C-(ii), D-(i)  
 (c) A-(iv), B-(iii), C-(i), D-(ii)  
 (d) A-(iii), B-(iv), C-(i), D-(ii) (2015)
- 40.** Cellular organelles with membranes are  
 (a) endoplasmic reticulum, ribosomes and nuclei  
 (b) lysosomes, Golgi apparatus and mitochondria  
 (c) nuclei, ribosomes and mitochondria  
 (d) chromosomes, ribosomes and endoplasmic reticulum. (2015)
- 41.** Which of the following are not membrane bound?  
 (a) Lysosomes (b) Mesosomes  
 (c) Vacuoles (d) Ribosomes (2015)
- 42.** DNA is not present in  
 (a) nucleus (b) mitochondria  
 (c) chloroplast (d) ribosomes. (2015 Cancelled)
- 43.** Nuclear envelope is a derivative of  
 (a) microtubules  
 (b) rough endoplasmic reticulum  
 (c) smooth endoplasmic reticulum  
 (d) membrane of Golgi complex. (2015 Cancelled)
- 44.** The structures that are formed by stacking of organised flattened membranous sacs in the chloroplasts are  
 (a) stroma lamellae (b) stroma  
 (c) cristae (d) grana. (2015 Cancelled)
- 45.** Select the correct matching in the following pairs.  
 (a) Rough ER – Synthesis of glycogen  
 (b) Rough ER – Oxidation of fatty acids  
 (c) Smooth ER – Oxidation of phospholipids  
 (d) Smooth ER – Synthesis of lipids (2015 Cancelled)

- 46.** The chromosomes in which centromere is situated close to one end are  
(a) telocentric                    (b) sub-metacentric  
(c) metacentric                    (d) acrocentric.

(2015 Cancelled)



(2014)

- 48.** The osmotic expansion of a cell kept in water is chiefly regulated by  
(a) mitochondria      (b) vacuoles  
(c) plastids              (d) ribosomes.      (2014)

- 49.** Match the following and select the correct answer.

(A) Centriole	(i) Infoldings in mitochondria
(B) Chlorophyll	(ii) Thylakoids
(C) Cristae	(iii) Nucleic acids
(D) Ribozymes	(iv) Basal body of cilia or flagella

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
(a) (iv)	(ii)	(i)	(iii)
(b) (i)	(ii)	(iv)	(iii)
(c) (i)	(iii)	(ii)	(iv)
(d) (iv)	(iii)	(i)	(ii)

(2014)

50. The Golgi complex plays a major role

  - (a) as energy transferring organelles
  - (b) in post translational modification of proteins and glycosylation of lipids
  - (c) in trapping the light and transforming it into chemical energy
  - (d) in digesting proteins and carbohydrates.

(NEET 2013)

51. Which one of the following organelle in the figure correctly matches with its function?

  - (a) Golgi apparatus, formation of glycolipids
  - (b) Rough endoplasmic reticulum, protein synthesis
  - (c) Rough endoplasmic reticulum, formation of glycoproteins
  - (d) Golgi apparatus, protein synthesis (NEET 2013)





- 53.** Which of the following types of plastid does not contain stored food material?

(a) Chromoplasts      (b) Elaioplasts  
(c) Aleuroplasts      (d) Amyloplasts

*(Karnataka NEET 2013)*

a) Rinyloplasts  
(Karnataka NEET 2013)

54. Select the alternative giving correct identification and function of the organelle 'A' in the diagram.

- (a) Mitochondria - Produce cellular energy in the form of ATP

(b) Golgi body - Provides packaging material

(c) Lysosomes - Secrete hydrolytic enzymes

(d) Endoplasmic reticulum - Synthesis of lipids

A

- 55.** Select the correct statement from the following regarding cell membrane.

- (a)  $\text{Na}^+$  and  $\text{K}^+$  ions move across cell membrane by passive transport.
  - (b) Proteins make up 60 to 70% of the cell membrane.
  - (c) Lipids are arranged in a bilayer with polar heads towards the inner part.
  - (d) Fluid mosaic model of cell membrane was proposed by Singer and Nicolson. (2012)

- 56.** What is true about ribosomes?

  - (a) The prokaryotic ribosomes are 80S, where “S” stands for sedimentation coefficient.
  - (b) These are composed of ribonucleic acid and proteins.
  - (c) These are found only in eukaryotic cells.
  - (d) These are self-splicing introns of some RNAs.

(2012)

57. Which one of the following does not differ in *E.coli* and *Chlamydomonas*?

- (a) Ribosomes
  - (b) Chromosomal organization
  - (c) Cell wall
  - (d) Cell membrane (2012)

- 58.** Which one of the following cellular parts is correctly described?

- (a) Thylakoids - flattened membranous sacs forming the grana of chloroplasts
  - (b) Centrioles - sites for active RNA synthesis
  - (c) Ribosomes - those on chloroplasts are larger (80S) while those in the cytoplasm are smaller (70S)
  - (d) Lysosomes - optimally active at a pH of about 8.5 (Mains 2012)

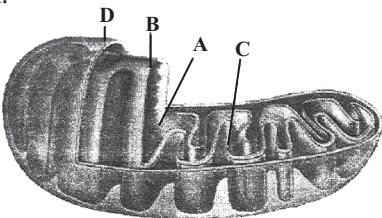
- 59.** Which one of the following structures is an organelle within an organelle?

- (a) Ribosome                      (b) Peroxisome  
 (c) ER                              (d) Mesosome

- 62.** Which one of the following is not considered as a part of the endomembrane system?  
 (a) Golgi complex      (b) Peroxisome  
 (c) Vacuole            (d) Lysosome

(Mains 2011)

- 63.** The figure below shows the structure of a mitochondrion with its four parts labelled A, B, C and D. Select the part correctly matched with its function.



- (a) D (outer membrane) – gives rise to inner membrane by splitting
- (b) B (inner membrane) – forms infoldings called cristae
- (c) C (crista) – possesses single circular DNA molecule and ribosomes
- (d) A (matrix) – major site for respiratory chain enzymes

(Mains 2011)

- 64.** The plasma membrane consists mainly of  
 (a) phospholipids embedded in a protein bilayer  
 (b) proteins embedded in a phospholipid bilayer  
 (c) proteins embedded in a polymer of glucose molecules  
 (d) proteins embedded in a carbohydrate bilayer.

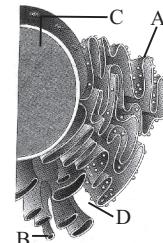
(2010)

- 65.** The main area of various types of activities of a cell is  
 (a) plasma membrane      (b) mitochondrion  
 (c) cytoplasm            (d) nucleus.         (2010)

- 66.** Which one of the following has its own DNA?  
 (a) Mitochondria      (b) Dictyosome  
 (c) Lysosome            (d) Peroxisome       (2010)
- 67.** Which one of the following structures between two adjacent cells is an effective transport pathway?  
 (a) Plasmodesmata      (b) Plastoquinones  
 (c) Endoplasmic reticulum  
 (d) Plasmalemma          (2010)

- 68.** An elaborate network of filamentous proteinaceous structures present in the cytoplasm which helps in the maintenance of cell shape is called  
 (a) thylakoid  
 (b) endoplasmic reticulum  
 (c) plasmalemma  
 (d) cytoskeleton.                 (Mains 2010)

- 69.** Identify the components labelled A, B, C and D in the diagram below from the list (i) to (viii) given along with



Components :

- (i) Cristae of mitochondria
- (ii) Inner membrane of mitochondria
- (iii) Cytoplasm
- (iv) Smooth endoplasmic reticulum
- (v) Rough endoplasmic reticulum
- (vi) Mitochondrial matrix
- (vii) Cell vacuole
- (viii) Nucleus

The correct components are:

- |          |          |          |          |
|----------|----------|----------|----------|
| <b>A</b> | <b>B</b> | <b>C</b> | <b>D</b> |
| (a) (v)  | (iv)     | (viii)   | (iii)    |
| (b) (i)  | (iv)     | (viii)   | (vi)     |
| (c) (vi) | (v)      | (iv)     | (vii)    |
| (d) (v)  | (i)      | (iii)    | (ii)     |

(Mains 2010)

- 70.** Middle lamella is composed mainly of  
 (a) muramic acid      (b) calcium pectate  
 (c) phosphoglycerides      (d) hemicellulose.       (2009)
- 71.** Cytoskeleton is made up of  
 (a) callose deposits      (b) cellulosic microfibrils  
 (c) proteinaceous filaments  
 (d) calcium carbonate granules.       (2009)

- 72.** Plasmodesmata are  
 (a) locomotory structures  
 (b) membranes connecting the nucleus with plasmalemma  
 (c) connections between adjacent cells  
 (d) lignified cemented layers between cells.       (2009)

- 73.** In germinating seeds, fatty acids are degraded exclusively in the  
 (a) peroxisomes      (b) mitochondria  
 (c) proplastids      (d) glyoxysomes.       (2008)

- 74.** Vacuole in a plant cell  
 (a) lacks membrane and contains air  
 (b) lacks membrane and contains water and excretory substances  
 (c) is membrane-bound and contains storage proteins and lipids  
 (d) is membrane-bound and contains water and excretory substances.       (2008)

- 75.** Keeping in view the 'fluid mosaic model' for the structure of cell membrane, which one of the following statement is correct with respect to the movements of lipids and proteins from one lipid monolayer to the other (described as flip-flop movement)?

- (a) While proteins can flip-flop, lipids can not  
 (b) Neither lipids, nor proteins can flip-flop  
 (c) Both lipids and proteins can flip-flop  
 (d) While lipids can rarely flip-flop, proteins cannot. (2008)

**76.** Which one of the following is not a constituent of cell membrane?  
 (a) Glycolipids (b) Proline  
 (c) Phospholipids (d) Cholesterol (2007)

**77.** Select the wrong statement from the following.  
 (a) Both chloroplasts and mitochondria have an internal compartment, the thylakoid space bounded by the thylakoid membrane.  
 (b) Both chloroplasts and mitochondria contain DNA.  
 (c) The chloroplasts are generally much larger than mitochondria.  
 (d) Both chloroplasts and mitochondria contain an inner and an outer membrane. (2007)

**78.** Which of the following statements regarding mitochondrial membrane is not correct ?  
 (a) The outer membrane resembles a sieve.  
 (b) The outer membrane is permeable to all kinds of molecules.  
 (c) The enzymes of the electron transfer chain are embedded in the outer membrane.  
 (d) The inner membrane is highly convoluted forming a series of infoldings. (2006)

**79.** Which of the following statements regarding cilia is not correct ?  
 (a) Cilia contain an outer ring of nine doublet microtubules surrounding two singlet microtubules.  
 (b) The organised beating of cilia is controlled by fluxes of  $\text{Ca}^{2+}$  across the membrane.  
 (c) Cilia are hair-like cellular appendages.  
 (d) Microtubules of cilia are composed of tubulin. (2006)

**80.** Chlorophyll in chloroplasts is located in  
 (a) grana (b) pyrenoid  
 (c) stroma  
 (d) both grana and stroma. (2005)

**81.** According to widely accepted “fluid mosaic model” cell membranes are semi-fluid, where lipids and integral proteins can diffuse randomly. In recent years, this model has been modified in several respects. In this regard, which of the following statements is incorrect?  
 (a) Proteins in cell membranes can travel within the lipid bilayer.  
 (b) Proteins can also undergo flip-flop movements in the lipid bilayer.  
 (c) Proteins can remain confined within certain domains of the membrane.

(d) Many proteins remain completely embedded within the lipid bilayer. (2005)

**82.** Centromere is required for  
 (a) movement of chromosomes towards poles  
 (b) cytoplasmic cleavage  
 (c) crossing over (d) transcription. (2005)

**83.** The main organelle involved in modification and outing of newly synthesized proteins to their destinations is  
 (a) chloroplast (b) mitochondria  
 (c) lysosome  
 (d) endoplasmic reticulum. (2005)

**84.** The telomeres of eukaryotic chromosomes consist of short sequences of  
 (a) thymine rich repeats (b) cytosine rich repeats  
 (c) adenine rich repeats (d) guanine rich repeats. (2004)

**85.** In chloroplasts, chlorophyll is present in the  
 (a) outer membrane (b) inner membrane  
 (c) thylakoids (d) stroma. (2004)

**86.** Ribosomes are produced in  
 (a) nucleolus (b) cytoplasm  
 (c) mitochondria (d) Golgi body. (2002)

**87.** In fluid mosaic model of plasma membrane  
 (a) upper layer is non-polar and hydrophilic  
 (b) upper layer is polar and hydrophobic  
 (c) phospholipids form a bimolecular layer in middle part  
 (d) proteins form a middle layer. (2002)

**88.** Element necessary for the middle lamella is  
 (a) Ca (b) Zn  
 (c) K (d) Cu. (2001)

**89.** Microtubules are absent in  
 (a) mitochondria (b) flagella  
 (c) spindle fibres (d) centrioles. (2001)

**90.** Lysosome contains  
 (a) oxidative enzymes (b) hydrolytic enzymes  
 (c) reductive enzymes (d) anabolic enzymes. (2000)

**91.** Which of the following ribosomes are engaged in protein synthesis in animal cell?  
 (a) Ribosomes which occur on nuclear membrane and ER  
 (b) Ribosomes of only cytosol  
 (c) Ribosomes of only nucleolus and cytosol  
 (d) Ribosomes of only mitochondria and cytosol (2000)

**92.** Function of telomeres in nucleus is  
 (a) poleward movement  
 (b) to initiate the RNA synthesis  
 (c) to seal the ends of chromosome  
 (d) to recognise the homologous chromosome. (2000)



# ANSWER KEY

1. (b) 2. (a) 3. (b) 4. (a) 5. (b) 6. (c) 7. (b) 8. (c) 9. (c) 10. (b)  
11. (b) 12. (c) 13. (d) 14. (b) 15. (d) 16. (b) 17. (a,c, d) 18. (d) 19. (a) 20. (b)  
21. (d) 22. (c) 23. (a) 24. (c) 25. (c) 26. (d) 27. (a) 28. (d) 29. (b) 30. (d)  
31. (d) 32. (c) 33. (b) 34. (a) 35. (a) 36. (d) 37. (a) 38. (b) 39. (d) 40. (b)  
41. (d) 42. (d) 43. (b) 44. (d) 45. (d) 46. (d) 47. (b) 48. (b) 49. (a) 50. (b)  
51. (b) 52. (d) 53. (a) 54. (a) 55. (d) 56. (b) 57. (d) 58. (a) 59. (a) 60. (d)  
61. (b) 62. (b) 63. (b) 64. (b) 65. (c) 66. (a) 67. (a) 68. (d) 69. (a) 70. (b)  
71. (c) 72. (c) 73. (d) 74. (d) 75. (d) 76. (b) 77. (a) 78. (c) 79. (b) 80. (a)  
81. (b) 82. (a) 83. (d) 84. (d) 85. (c) 86. (a) 87. (c) 88. (a) 89. (a) 90. (b)  
91. (a) 92. (c) 93. (c) 94. (b) 95. (c) 96. (b) 97. (b) 98. (d) 99. (d) 100. (c)  
101. (d) 102. (c) 103. (a) 104. (b) 105. (b) 106. (a) 107. (c) 108. (c) 109. (d) 110. (d)  
111. (d) 112. (b) 113. (a) 114. (a) 115. (b) 116. (c) 117. (c) 118. (b) 119. (c) 120. (a)  
121. (d) 122. (b) 123. (c) 124. (c) 125. (d) 126. (d) 127. (c) 128. (c) 129. (d)