

BIOLOGY

CLASS-XI

NEET

EXPLANATIONS

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Answer Key

Topic-wise Questions

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
b	c	b	a	b	d	c	d	a	b	b	d	c	b	d	c	c
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
d	c	b	d	c	a	c	a	d	d	d	d	a	c	b	a	c
35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
a	c	c	c	d	b	b	c	d	b	a	d	a	d	c	d	a
52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68
a	d	a	a	a	a	a	b	c	d	b	c	a	c	b	a	c
69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85
a	a	b	c	a	c	a	b	b	c	c	d	d	b	a	a	b
86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102
d	a	d	b	b	a	c	c	d	d	c	c	d	d	c	d	d
103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
d	c	c	d	a	b	c	d	d	c	a	d	c	b	d	a	c
120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136
b	b	d	c	d	c	c	c	b	d	a	c	b	a	d	c	b
137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153
d	d	a	c	d	b	c	b	c	a	c	d	c	a	c	b	b
154	155	156	157	158	159	160	161	162	163							
d	b	a	c	b	c	d	d	d	d							

NCERT Based Questions

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
d	a	d	b	b	a	a	b	c	b	c	a	d	c	a	d	a
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
c	a	d	d	d	d	c	b	d	a	d	a	b	a	c	a	c
35	36	37	38	39	40	41	42	43	44	45						
d	d	b	d	c	c	b	b	c	c	d						

Multi-Concept Questions

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
c	d	c	a	c	c	c	c	b	d	c	b	a	d	c	d	d
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32		
a	b	b	c	b	b	a	d	d	b	c	b	a	c	d		

NEET Past 10 Year Questions

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
a	b	c	a	d	c	b	d	a	b	a	d	b	d	a	d	d
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
d	b	c	d	b	c	c	d	d	b	b	c	b	d	d	d	b
35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
d	a	c	c	d	a	d	a	c	c	c	a	b	a	c	a	a
52	53	54	55	56	57	58	59	60	61	62						
a	a	c	a	c	d	d	c	a	a	c						

8. Cell: The Unit of Life



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Topic-wise Questions

1. (b) Cell wall and chloroplast are present in plant cell only.
2. (c)
3. (b)
4. (a) Blood platelets are 2-3 μm in diameter but they are considered to be cell fragment instead of being cell themselves. Thus, erythrocytes are considered as the smallest cell.
5. (b)
6. (d) *Omnis cellula-e cellula* was given by Rudolf Virchow.
7. (c)
8. (d) All cells have a plasma membrane. Organelles are present only in eukaryotes.
9. (a)
10. (b) Rudolf Virchow first explained that cells divided and new cells are formed from pre-existing cell (*Omnis cellula a cellula*).
11. (b)
12. (d)
13. (c) The largest isolated single cell is ostrich egg.
14. (b) Prokaryotes do not have a well-defined nucleus.
15. (d)
16. (c) The cell as a basic unit of structure of living things was discovered by Robert Hooke.
17. (c) Mesosomes, infoldings of prokaryotic cell membrane, are functionally similar to mitochondria.
18. (d)
19. (c)
20. (b)
21. (d)
22. (c) Larger subunit of prokaryotic ribosome is 50 S and smaller subunit is 30 S.
23. (a)
24. (c) Gas vacuoles are present in blue, green and purple photosynthetic bacteria.
25. (a)
26. (d) The prokaryotic cells lack membrane bound organelles, nucleolus and centrioles.
27. (d) Several ribosomes may attach to a single mRNA and form a chain called polysome or polyribosome.
28. (d) Prokaryotic cell wall is made up of peptidoglycan. It is also called murein or mucopeptide.
29. (d) In some prokaryotes like cyanobacteria, there are membranous extension into the cytoplasm called chromatophores which contain pigments.
30. (a) The genetic material of prokaryotes is basically naked and is not enveloped by a nuclear membrane.
31. (c) In prokaryotes, a well-developed nucleus is absent but ribosomes are found.
32. (b) The cell envelope of bacteria consists of three components glycocalyx, cell wall and cell membrane.
Glycocalyx- It is the outermost mucilage layer of the cell envelope.
Cell Wall- It is rigid solid covering, which provides shape and structural support to the cell. Cell wall lies between plasma membrane and glycocalyx.
Plasma/cell membrane-It is selectively permeable covering of the cytoplasm that forms the innermost component of cell envelope.
33. (a) The longest portion of the bacterial flagella that extends from the cell surface to the outside is called filament.
34. (c) Gas vacuoles are found in some prokaryotes and are without tonoplast. E.g., blue-green, purple and green photosynthetic bacteria.
35. (a) Cell wall determines the shape of the cell and provides a strong structural support to prevent the bacterium from bursting or collapsing.
36. (c) Prokaryotic ribosomes are made of two subunits (30 S + 50 S), which when present together form 70 S.
37. (c) Mesosome is a special membranous structure which is formed by the extension of plasma membrane into the cell. These extensions are in the form of vesicles, tubules and lamellae. They functions in cell wall formation, DNA replication and distribution to daughter cell. They also help in respiration and secretion processes and increases the surface area of the plasma membrane and enzymatic content.
38. (c) Many bacteria have small circular DNA outside the genomic DNA. These smaller DNA are called plasmids.
39. (d)
40. (b) The only definitive characteristic listed the presence or absence of a nucleus.

41. (b) Nuclear membrane is not found in prokaryotic cell.
 42. (c) Mesosome is seen only in prokaryotic cell.
 43. (d) Bacterial flagellum consists of three parts—filament, hook and basal body.
 44. (b) All the other structures given are found in eukaryotic cell.
 45. (a)
 46. (d) The main function of sphaerosomes is to help in lipid metabolism. These are also known as plant lysosomes. In animal cells, smooth endoplasmic reticulum involves in lipid synthesis.
 47. (a) Ribosomes are the site of protein synthesis. In animal cells, protein synthesis occurs on ribosomes present in cytoplasm as well as in mitochondria.
 48. (d) Non-membranous organelles are nucleolus, ribosome and centriole.
 49. (c) Ribosomes are non-membrane bound organelles found in all cells. They are found in the cytoplasm, chloroplasts (in plants), mitochondria and on rough ER.
 50. (d) 51. (a)
 52. (a) Disappearance of tadpole tail during metamorphosis is brought about by ‘apoptosis’. Lysosomes are involved in terminal steps of autophagy.
 53. (d) 54. (a)
 55. (a) DNA is found in mitochondria, plastids and chromosomes.
 56. (a) 57. (a)
 58. (a) Centriole is important in spindle formation during nuclear division.
 59. (b) 60. (c)
 61. (d) The nucleus has a loose and indistinct network of nucleoprotein fibres called chromatin.
 62. (b)
 63. (c) rRNA is synthesised in nucleolus.
 64. (a) 65. (c)
 66. (b)
 - Centrioles are cylindrical structures that lie perpendicular to each other.
 - Centrioles have an organisation like cart wheel.
 - Centrioles are made up of nine evenly spaced peripheral fibrils of tubulin protein.
 - Each peripheral fibril of centriole is triplet.
 - Central part of the proximal region of the centriole is called hub.
 67. (a)
 68. (c) Cilium and flagellum emerge from centriole-like structure called basal body.
 69. (a)
 70. (a) In acrocentric chromosome, the centromere is situated close to its end one arm is very long and one arm is very short.
 71. (b) 72. (c)
 73. (a) In 70S and 80S ribosomes, ‘S’ stands for sedimentation coefficient and called Svedberg unit.
 74. (c) 75. (a)
 76. (b) The number of chloroplast varies from 1 per cell in *Chlamydomonas* to 20 to 40 per cell in the mesophyll.
 77. (b) 78. (c)
 79. (c) Mitochondria is known as the powerhouse of the cell. It is responsible for energy releasing reactions.
 80. (d)
 81. (d) Secondary wall situated near the plasma membrane after the formation of primary wall.
 82. (b) Both glycolipids and glycoproteins serve as recognition signals for interaction between cells.
 83. (a)
 84. (a) Both peroxisomes and lysosomes are single membrane bound organelles.
 85. (b)
 86. (d) Factors that affects the rate of diffusion will also affect the carrier-mediated facilitated diffusion.
 87. (a) 88. (d)
 89. (b) Membrane components, especially proteins, glycolipids, and glycoproteins, are distributed asymmetrically.
 90. (b)
 91. (a) The nuclear pores are the passages through which movement of RNA and protein molecules takes place in both directions between the nucleus and the cytoplasm.
 92. (c)
 93. (c) According to fluid mosaic model, proteins are embedded in phospholipid bilayer.
 94. (d)
 95. (d) The mitochondrion is known as powerhouse of the cell. It is the organelle where the bulk of the reactions and ATP synthesis take place.
 96. (c) On the basis of type of pigments, plastids can be classified into three—chloroplasts, chromoplasts and leucoplasts.
 97. (c)
 98. (d) ER is directly connected to the outer membrane of the nucleus. This connection allows material produced in the nucleus to directly enter the ER via the nuclear pores.

Cell: The Unit of Life

- 99. (d)** In plants, cell wall is made up of cellulose, hemicellulose, pectins and proteins.
- 100. (c)** Both Golgi apparatus and SER are folded membranes that can produce vesicles.
- 101. (d)** The nucleus contains chromosomes. Chloroplasts and mitochondria also have their own DNA.
- 102. (d)** The various functions of the cell wall are to provide shape of the cell and protects the cell from the mechanical damage and infection, helps in cell-to-cell interaction and provides barrier to undesirable macromolecules.
- 103. (d)** The nucleus, mitochondria, and chloroplasts are double membrane-bound organelles.
- 104. (c)** Cell wall is common in both prokaryotic and plant cells.
- 105. (c)** Elaioplast are also called oleoplast.
- 106. (d)** **107. (a)**
- 108. (b)** Plasmodesmata connect the cytoplasm of neighbouring cell and middle lamella holds or glues the different neighbouring cell together.
- 109. (c)**
- 110. (d)** The fluid nature of the membrane is important from the point of view of functions like cell division, cell growth, endocytosis, secretion and formation of intercellular junctions.
- 111. (d)** **112. (c)**
- 113. (a)** Golgi apparatus is an important site of modification and packaging of proteins.
- 114. (d)**
- 115. (c)** They lysosome is filled with 40 types of acid hydrolases (digestive enzymes). They acidity $\text{pH} \leq 5$ (4.6 to 5) is due to the action of ATP fueled proton pump in the membrane of lysosome. There digestive enzymes are synthesized on RER and packed into lysosomes.
- 116. (b)** Endoplasmic reticulum is an interconnected membranous network of the cell composed of vesicles, flattened sacs and tubules.
- 117. (d)** **118. (a)**
- 119. (c)** Middle lamella is made up of pectate which holds the different neighbouring cells together.
- 120. (b)** Centrioles and centrosomes occur in the animals cells.
- 121. (b)** **122. (d)**
- 123. (c)** Cells will die if lysosomes get ruptured inside the cell due to the release of lysosomal enzymes (hydrolytic enzymes).
- 124. (d)**
- 125. (c)** Cristae are present in the wall of mitochondria.
- 126. (c)** Depending on the ease of extraction, membrane proteins can be classified as integral and peripheral.
- 127. (c)** Oxyosomes (elementary particles or F_0 or F_1 particles); are present in mitochondria and responsible for respiratory chain phosphorylation.
- 128. (b)**
- 129. (d)** Chromatin, ribosome and virus are the nucleoprotein structures.
- 130. (a)** Majority of the chloroplasts of the green plants are found in the mesophyll cells.
- 131. (c)** **132. (b)**
- 133. (a)** Lysosome — Breaking of complex macromolecules
- 134. (d)** Chromoplasts are developed from proplastids, leucoplasts and chloroplasts. Transformation of chloroplasts is observed during ripening of fruit (e.g., tomato, chilli) when they change their colour from green to reddish orange.
- 135. (c)** Active transport is involved in transporting molecules across the membrane against their concentration gradient, i.e., from the lower to the higher concentration. E.g., Na^+/K^+ pump.
- 136. (b)**
- 137. (d)** Peroxisomes are rich in glycolic acid and oxidase, which oxidises glycolic acid (a poroduct of photosynthesis) to glyoxylic acid.
- 138. (d)**
- 139. (a)** Extra chromosomal DNA occurs in mitochondria and chloroplast.
- 140. (c)**
- 141. (d)** The endomembrane system of eukaryotic cells include ER, golgi complex, lysosomes and vacuoles.
- 142. (b)** **143. (c)**
- 144. (b)** Mitoplast is not a type of plastid.
- 145. (c)**
- 146. (a)** Lysosomes are rich in almost all types of hydrolytic enzymes and thus are capable of intracellular digestion of macromolecules is lysosome.
- 147. (c)** Cell membrane possess lipid, protein and carbohydrates. The ratio of protein and lipid varies considerably in different cell types. In human beings, the membrane of the RBCs has approximately 40 per cent lipids and 52 per cent proteins.
- 148. (d)** Endoplasmic reticulum is involved in the modification and routing of newly synthesised proteins to their destination.

149. (c) Endoplasmic reticulum is extensive and continuous with the outer membrane of the nucleus. It connects nuclear envelope with cell membrane.
150. (a) A plant cell contains a large central vacuole and rigid cell wall.
151. (c) The primary wall of a young plant cell is capable of growth, which gradually diminishes as the cell matures and the secondary wall is formed on the inner (towards membrane) side of the cell.
152. (b) 3 membranes, i.e., thylakoid membrane and two double membranous chloroplast, separates intrathylakoid space (lumen) from cytoplasm.
153. (b)
154. (d) Sedimentation coefficient(s) indirectly is a measure of size and density.
155. (b) Oxyosomes or F_0-F_1 particles are small particles projecting from inner surfaces of cristae and inner mitochondrial membrane.
156. (a) The membrane of the thylakoids encloses a space called lumen.
157. (c) Stack of lamella found inside a plastid is called granum.
158. (b) Quantasomes are found in grana/chloroplast.
159. (c) Microbodies are membrane bound minute vesicles that contain various enzymes and are present in both plant and animal cells.
160. (d) Mitochondria is called power house of the cell or ATP mills as these are sites of ATP formation respiration & through electron transport and oxidative phosphorylation which is used in various metabolic activities/functions of the cell.
161. (d)
163. (d)
163. (d) In endoplasmic reticulum, the detoxification of lipid soluble drugs and other harmful compound is carried out by cytochrome P_{450} .
- channels which traverse the cell walls of plant cells and some algal cells, enabling transport and communication between them.
3. (d) Ribosomes are non-membrane bound organelles and they play a vital role in protein synthesis. Thus, the statement that ribosomes have no role in protein synthesis is incorrect.
4. (b) In the given options, *Anabaena* is the only organism that is not an eukaryote and only possess prokaryotic characteristic features, i.e., absence of membrane-bound organelles and undefined nucleus.
5. (b) Safranin is used as a counterstain in gram staining and endospore staining. It can also used for detection of cartilage, mucin and mast cell granule.
6. (a) Satellite is a small chromosomal segment separated from the main body of the chromosome by a secondary constriction. In humans it is usually associated with the short arm of an acrocentric chromosome. They play a vital role in the formation of the nucleolus after cell division. In humans, chromosomes number 13, 14, 15, 21 and 22 are examples of SAT (satellite) chromosomes.
7. (a) Cells in organism vary greatly in their size, shapes and activities.
I. Mycoplasmas are the smallest cell with size only 0.3 μm .
II. Bacterial cell are of size 3 - 5 μm .
III. In human, red blood cells are of about 7.0 μm in diameter.
IV. Ostrich eggs are among the largest cells with size (15 \times 13) cm.
8. (b) Presence of cell wall is the common feature that is observed in both prokaryotic and some eukaryotic cells. It is found in bacteria (prokaryotes). fungi, algae and plants (eukaryotes). Prokaryotes lack nuclear membrane, membrane bound sub-cellular organelles and their genetic material is naked, called nucleoid.
9. (c) Singer and Nicolson (1972) proposed the structure of cell membrane that was widely accepted and called as fluid mosaic model which states that fluid, native of lipids helps in the movement of protein within the membrane.
10. (b) Rough Endoplasmic Reticulum (RER) is observed in the cells that are actively involved in the protein synthesis and secretin.
11. (c) In plant cell, the vacuole is bound by a single membrane called tonoplast. The tonoplast facilitates the transport of ions and other material against the concentration gradient into the vacuole. Hence, their concentration is higher in the vacuole than in the cytoplasm.
12. (a) A cell wall that is made up of peptidoglycan is found in

NCERT Based Questions

1. (d) The common characteristic feature of plant sieve tube and mammalian erythrocyte is the absence of nucleus. Sieve tubes are the component of phloem and do not contain nucleus. Similarly, erythrocytes in mammalian cell also do not possess nucleus. Erythrocytes are the RBCs which helps in gaseous exchange.
2. (a) Plasmodesmata is an effective transport pathway present between two adjacent cells. They are microscopic

bacteria and not in eukaryotes. Eukaryotic cell wall is made up of cellulose, hemicellulose, pectin, chitin etc.

13. (d) The biochemical investigation done on cell membrane clearly demonstrate that the cell membrane possess protein and carbohydrates as biochemical components.
14. (c) Presence of thylakoids, the structural elements of chloroplast, differs them (plastids) from mitochondria. Thylakoids are flattened sacs stacked one above the other to form grana. They help in photosynthesis.
15. (a) Cytoskeleton is not associated with the intracellular transport. The microtubules and microfilaments are the components of cytoskeleton and are responsible for cellular and intercellular movements. Rest of the options are functions of cytoskeleton in a cell.
16. (d) Janus green is used to stain mitochondria. Janus green act as an indicator and changes colour according to the amount of oxygen present. It oxidizes to blue colour in presence of oxygen and in its absence, changes its colour to pink.
17. (a) Ribosomes are about 15 nm by 20 nm in size.
18. (c) The plasma membrane of prokaryotes is structurally similar to that of eukaryotes.
19. (a) Mesosomes are only found in prokaryotic cells.
20. (d) The cell envelope consists of a tightly bound three layer structure, i.e., the outermost glycocalyx followed by the cell wall and then the plasma membrane.
21. (d) All the functions described are performed by Golgi apparatus.

The Golgi apparatus is an organelle found in most eukaryotic cells. It was identified in 1897 by the Italian physician Camillo Golgi and named after him in 1898. Golgi apparatus is the important site of formation of glycoproteins and glycolipids.

22. (d)
- a. In plant cells, the vacuoles can occupy up to 90% of the volume of the cell
- b. In plants, the tonoplast facilitates the transport of a number of ions and other materials against concentration gradient into the vacuole, hence their concentration is significantly higher in the vacuole than in the cytoplasm.
- c. In Amoeba, the contractile vacuole is important for excretion.
- d. In many cells, as in protists, food vacuoles are formed by engulfing the food particles.
23. (d)

Osmosis and passive transport	Without any requirement of energy
Active transport	ATP energy is utilised

24. (c) The number of mitochondria per cell is variable depending on the physiological activity of the cells. In terms of shape and size also, considerable degree of variability is observed.
25. (b) Protein synthesis takes place in ribosomes, which are attached to surface of endoplasmic reticulum by ribophorin-I and ribophorin-II. About 50 hydrolytic enzymes are found in the lysosome. They include proteases, nucleases, glycosidases, lipases, phospholipases, phosphatases and sulphatases. All lysosomal enzymes are acid hydrolases and optimally active at pH-5.0.
26. (d) Inclusion bodies, a non-membrane bound cell organelle, are concerned with storage of reserve food materials, e.g., cyanophycean granules, etc.
27. (a) In prokaryotic cell, outgrowth of plasma membrane into cell is called polysome. Golgi apparatus is the important site of formation of glycoproteins and glycolipids.
28. (d) Reserve material in prokaryotic cells are stored in the cytoplasm in the form of inclusion bodies. These are not bound by any membrane system and lie free in the cytoplasm.
29. (a) Nucleolus is not surrounded by a membrane.
30. (b) The lipid component of the cell membrane mainly consists of phosphoglycerides.
31. (a) Lysosomes are membrane bound vesicular structures formed by the process of packing in the Golgi apparatus.
32. (c) Phospholipid molecules of cell membrane composed of one polar head and two non-polar tails.
33. (a) Lysosomal vesicles are rich in Hydrolytic enzymes-lipases, proteases and carbohydrases.
34. (c) The axoneme usually has nine pairs of doublets of radially arranged peripheral microtubules, and a pair of centrally located microtubules. Such an arrangement of axonemal microtubules is referred to as the 9 + 2 array.
35. (d) All three the ability to multiply by a fission-like process.
36. (d) The typical flow of membrane within the cell is from nuclear envelope (B) to rough ER (A), from rough ER (A) to Golgi apparatus (C), and from Golgi apparatus (C) to plasma membrane (E). Membrane movement between nuclear envelope, Golgi apparatus, and ER via vesicles.
37. (b) Vacuole is a membrane bound organelle, found in both animal and plant cells but are much larger in plant cells. Vacuoles are essentially enclosed compartments which

are filled with water containing inorganic and organic molecules including enzymes in solution, vacuoles might store food or any variety of nutrients a cell might need to survive. They can even store waste products so the rest of the cell is protected from contamination.

- 38. (d)** The given characters are related to cell organelle - vacuole. Vacuole is a membrane bound organelle, found in both animal and plant cells but are much larger in plant cells. Vacuoles are essentially enclosed compartments which are filled with water containing inorganic and organic molecules including enzymes in solution, though in certain cases they may contain solids which have been engulfed. Vacuoles might store food or any variety of nutrients a cell might need to survive. They can even store waste products so the rest of the cell is protected from contamination.

- 39. (c)** Pair A is correct.

Lysosomes – It stores hydrolytic enzymes.

Amyloplasts – They are responsible for the synthesis and storage of starch granules, through the polymerization of glucose.

Elaioplasts – It stores oil and fats.

Aleuroplasts – It stores proteins.

- 40. (c)** The smooth endoplasmic reticulum is the major site for synthesis of lipid. It is associated with the detoxification and metabolism of drugs. It involves in the muscle contraction by the release and uptake of Ca^{+2} ions.

“Many membrane bound minute vesicles called microbodies that contain various enzymes are present in both plant and animal cells”.

- 41. (b)** The cell wall protects the cell, maintains its shape and provides supports and strength to it. Nucleus controls the cell's activities. Chloroplast is a cell organelle that makes food for the plant cell. The cell membrane holds the parts of the cell together and also separates the cell from its surroundings.

- 42. (b)** These are membrane bound vesicular structures formed by the process of packaging in the Golgi apparatus. The isolated lysosomal vesicles have been found to be very rich in almost all types of hydrolytic enzymes optimally active at the acidic pH. These enzymes are capable of digesting carbohydrates, proteins, lipids and nucleic acids.

- 43. (c)** On the basis of the presence and absence of ribosome, ER is divided into two types, i.e., RER and SER respectively. RER involves in protein synthesis and SER involves in lipid synthesis.

- 44. (c)** Mitochondria are the sites of aerobic respiration. They produce cellular energy in the form of ATP, hence they are

called ‘power houses’ of the cell. In absence of oxygen, respiration does not take place and mitochondria would be absent.

- 45. (d)** The matrix of mitochondria possesses single circular DNA molecule, a few RNA molecules, ribosomes (70S) and the components required for the synthesis of proteins.

Multi-Concept Questions

- 1. (c)** Membrane proteins are of two types: integral and peripheral. Integral proteins are partially or totally buried in the membrane while peripheral proteins lie on the surface of membrane.

- 2. (d)**

- 3. (c)** Smooth ER synthesizes and stores glycogen in skeletal muscle and liver cells.

- 4. (a)**

- 5. (c)** Matrix and cristae are present in mitochondria

- 6. (c)**

- 7. (c)**

- 8. (c)** According to fluid mosaic model (proposed by Singer & Nicolson), plasma membrane is composed of phospholipids, extrinsic protein and intrinsic protein.

- 9. (b)** The plasma membrane is composed of lipid bilayer, extrinsic and intrinsic proteins. The movement of lipid molecules from one lipid monolayer to another monolayer is called flip-flop movement. Flip-flop movement is rarely found in lipid molecules whereas it remain absent in protein molecules.

- 10. (d)** Golgi apparatus is the important site of formation of glycoproteins and glycolipids. Of all the post-translational modifications, phosphorylation (addition of phosphate group) and glycosylation (addition of saccharide) are the major players in many of the protein functions.

- 11. (c)**

- 12. (b)** The cytoplasm is the main arena of cellular activities in both plant and animal cells.

- 13. (a)**

- 14. (d)**

- 15. (c)** Plant cells contain smaller Golgi apparatus type vesicles, which are called dictyosomes. However, centrioles are absent in plant cell.

- 16. (d)** Microbodies are membrane-bound minute vesicular organelles. They are found in both plant and animal cells. They contain various enzymes and proteins, but not genetic material.

- 17. (d)**

18. (a) The content of nucleolus is continuous with the rest of the nucleoplasm as it is not a membrane bound structure. In the chromoplasts, fat soluble carotenoid pigments like carotene, xanthophylls and others are present. The axoneme usually has nine pairs of doublets of radially arranged peripheral microtubules, and a pair of centrally located microtubules. Such an arrangement of axonemal microtubules is referred to as the 9+2 array.
19. (b) The cell envelope consists of a tightly bound three layered structure i.e., the outermost glycocalyx followed by the cell wall and then the plasma membrane. Convex face of golgi bodies is forming face.
20. (b) Animal cells have centrioles which are absent in almost all plant cells.
21. (c) Mitochondria and chloroplast both are considered as sites of production of cellular energy. They contain circular naked DNA, RNA and 70S ribosomes.
22. (b) Chloroplasts have a highly permeable outer membrane; a much less permeable inner membrane, in which membrane transport proteins are embedded.
23. (b) An *Amoeba* engulfs its prey and part of the plasma membrane pinches off to form a food vacuole inside the cell. The vacuole fuses with a lysosome, a membrane enclosed sac containing hydrolytic enzymes, that digest the prey. The resulting small food molecules are absorbed into the cytoplasm before the indigestible.
24. (a)
25. (d) The organelle chloroplast is found exclusively in plants.
26. (d) Prokaryotes lack membrane-bound organelles. Archaeobacteria can survive in high salinity and at high temperature.
27. (b) The pellet is undergoing cellular respiration i.e., production of ATP. It occurs in the mitochondria.
28. (c)
29. (b)
30. (a) The statements which are consistent with the scientist's observation are:
A. The toxin was stored in the central vacuole
B. The toxin can cross the plasma membrane but not the membrane of the organelle in which it is stored
E. The toxin may be an enzyme.
31. (c) Many proteins must be deposited into the ER lumen (membranous sacs) as they are made. Some of these are to be secreted out of the cell and must start their journey in the ER: others are simply too dangerous to synthesize in the cell's cytoplasm (cytosol), such as lysosomal hydrolases that would digest away parts of the cell if

allowed to freely float around the cell after synthesis.

32. (d)

NEET Past 10 Year Questions

1. (a) *NCERT (XI) Ch - 8, Pg. 129*

Reserve material in prokaryotic cells are stored in the cytoplasm in the form of inclusion bodies. These are not bound by any membrane system and lie free in the cytoplasm.

Lysosomes are involved in ingestion of food particle.

2. (b) *NCERT (XI) Ch - 8, Pg. 134*

Golgi bodies are the important site of formation of glycoproteins and glycolipids.

3. (c) *NCERT (XI), Ch - 8, Pg. 138*

Nucleolus is a site for active ribosomal RNA synthesis. Larger and more numerous nucleoli are present in cells actively carrying out protein synthesis.

4. (a) *NCERT (XI), Ch - 8, Pg. 129*

Reserve material in prokaryotic cells are stored in the cytoplasm in the form of inclusion bodies. These are not bound by any membrane system and lie free in the cytoplasm, e.g., phosphate granules, cyanophycean granules and glycogen granules. Gas vacuoles are found in blue green and purple and green photosynthetic bacteria.

5. (d) *NCERT (XI), Ch - 8, Pg. 133, 134, 138*

The smooth endoplasmic reticulum is the major site for synthesis of lipid. In animal cells lipid-like steroidal hormones are synthesised in SER.

RER is frequently observed in the cells actively involved in protein synthesis and secretion. They are extensive and continuous with the outer membrane of the nucleus.

Golgi apparatus is the important site of formation of glycoproteins and glycolipids.

The centrioles form the basal body of cilia or flagella, and spindle fibres that give rise to spindle apparatus during cell division in animal cells.

6. (c) *NCERT (XI), Ch - 8, Pg. 128, fig. 8.2*

The prokaryotic cells are represented by bacteria, blue-green algae, mycoplasma and PPLO (Pleuro Pneumonia Like Organisms). The size of PPLO is 0.1 μm .

7. (b) *NCERT (XI) Ch - 8*

Shorter arm and longer arm of chromosome is designated as 'p' arm (p = petite i.e. short) and 'q' arm respectively.

8. (d) *NCERT (XI) Ch - 8, Pg. 134*

Lysosomes bud off from trans face of Golgi bodies.

Precursor of lysosomal enzymes are synthesised by RER and then send to Golgi bodies for further processing.

9. (a) NCERT (XI) Ch - 8, Pg. 126

The concept of “*Omnis cellula-e cellula*” regarding cell theory was first proposed by Rudolf Virchow.

10. (b) NCERT (XI) Ch - 8, Pg. 135

In mitochondria, enzymes for electron transport are embedded in the inner membrane.

11. (a) *Saccharomyces* is a genus of yeast.

12. (d) NCERT (XI) Ch - 8, Pg. 138

Nucleolus is a small dense spherical structure in nucleus of cell. It is the site of ribosome biosynthesis.

13. (b) NCERT (XI) Ch - 8, Pg. 134

Golgi complex (apparatus) is a packaging organelle like ER. It modifies the proteins and lipids from ER and concentrate them and packs them into secretory vesicles.

14. (d) NCERT (XI) Ch - 8, Pg. 133

Phospholipid synthesis occurs in the cytosol adjacent to ER membrane. In smooth endoplasmic reticulum, phospholipids are synthesised from phosphatidic acid and 1, 2 - diacylglycerol.

15. (a) NCERT (XI) Ch - 8, Pg. 129

Polysome or polyribosome is a cluster of ribosomes held together by a strand of mRNA.

16. (d) NCERT (XI) Ch - 8, Pg. 139

Polytene chromosomes are present in salivary glands of Dipteran larvae.

17. (d) NCERT (XI) Ch - 8, Pg. 135

Mitochondria is the site of aerobic oxidation of carbohydrates to generate ATP.

18. (d) NCERT (XI) Ch - 8, Pg. 128

Sticky character of the bacterial wall is due to glycocalyx or slime layer. This layer is rich in glycoproteins.

19. (b) The correct sequence of involvement of the cell organelles in secretion of proteins from the cell is Nucleus → Ribosomes → Endoplasmic reticulum → Golgi apparatus → Secretory vesicles → Plasma membrane.

20. (c) NCERT (XI) Ch - 8, Pg. 134

Materials to be packaged in the form of vesicles from the RER fuse with the cis face of the Golgi apparatus and move towards the maturing face and then they are released from its trans face.

21. (d) NCERT (XI) Ch - 8, Pg. 134-136

The mitochondrial, chloroplast and prokaryotic ribosomes are 70S.

22. (b) NCERT (XI) Ch - 8, Pg. 129

Reserve material in prokaryotic cells is stored in the cytoplasm in the form of inclusion bodies.

23. (c) NCERT (XI) Ch - 8, Pg. 129

In the cytoplasm, several ribosomes attach to a single strand of mRNA, forming a structure known as a polyribosome or polysome.

24. (c) NCERT (XI) Ch - 8, Pg. 134

The isolated lysosomal vesicles have been found to be very rich in almost all types of hydrolytic enzymes (hydrolases – lipases, proteases, carbohydrases) optimally active at the acidic pH.

25. (d) NCERT (XI) Ch - 8, Pg. 129

The pili are elongated tubular structures made of a special protein. The fimbriae are small bristle like fibres sprouting out of the cell. In some bacteria, they are known to help attach the bacteria to rocks in streams and also to the host tissues but they do not play a role in motility.

26. (d) NCERT (XI) Ch - 8, Pg. 129

Plant and animal cells are different as plant cells possess cell walls, plastids and a large central vacuole which are absent in animal cells. On the other hand, animal cells have centrioles which are absent in almost all plant cells.

27. (b) NCERT (XI) Ch - 8, Pg. 137

Microtubules are the constituents of spindle fibres, centrioles and cilia.

28. (b) NCERT (XI) Ch - 8, Pg. 139

Spindle fibres attach on to kinetochore of the chromosome

29. (c) NCERT (XI) Ch - 8, Pg. 135

Mitochondria and chloroplast both are semi-autonomous organelles and both contains single circular DNA, a few RNA molecules, ribosomes (70S) and the components required for the synthesis of proteins.

30. (b) NCERT (XI) Ch - 8, Pg. 129

Reserve material in prokaryotic cells are stored in the cytoplasm in the form of inclusion bodies, e.g., phosphate granules, glycogen granules and cyanophycean granules.

31. (d) NCERT (XI) Ch - 8, Pg. 139

In acrocentric chromosomes, the centromere is situated

close to its ends forming one extremely short and one very long arm.

32. (d) NCERT (XI) Ch - 8, Pg. 133

RER - Synthesis of protein.

SER - Synthesis of lipid and steroidal hormones.

33. (d) NCERT (XI) Ch - 8, Pg. 136

A number of organised flattened membranous sacs called the thylakoids, are present in the stroma. Thylakoids are arranged in stacks like piles of coins called grana.

34. (b) NCERT (XI) Ch - 8, Pg. 138

Nucleus is a double membrane bound organelle. Its outer membrane usually remains continuous with the endoplasmic reticulum bearing ribosomes.

35. (d) NCERT (XI) Ch - 8, Pg. 136

Except ribosomes, nucleus, chloroplast and mitochondria have DNA. Ribosomes are composed of ribonucleic acid (RNA) and proteins and are not surrounded by any membrane.

36. (a) NCERT (XI) Ch - 8, Pg. 133, 135 and 136

In chloroplasts, a number of organised flattened membranous sacs called the thylakoids, are present in the stroma. The inner mitochondrial membrane forms a number of infoldings called the cristae towards the matrix. Golgi bodies consists of many flat, disc-shaped sacs or cisternae, stacked parallel to each other, of 0.5 μm to 1.0 μm diameter.

37. (c) NCERT (XI) Ch - 8, Pg. 136

Ribosomes are the granular structures first observed by George Palade (1953). They are not surrounded by any membrane.

38. (c) Polytene chromosomes first seen in salivary gland of *Chironomus tentans*. They show puff or balbiani rings which develops lateral loops where DNA becomes active and produce copies of RNA.

39. (d) NCERT (XI) Ch - 8, Pg. 129

In some prokaryotes like cyanobacteria, there are other membranous extensions besides mesosomes, into the cytoplasm called chromatophores which contain photosynthetic pigments.

40. (a) NCERT (XI) Ch - 8, Pg. 129

The fimbriae are small bristle like fibers sprouting out of the cell. They are known to help in attachment of the bacteria to rocks in streams and also to the host tissues.

41. (d) NCERT (XI) Ch - 8, Pg. 127

Prokaryotic cells do not have membrane bound organelles.

They lack a membrane bound nucleus.

42. (a) NCERT (XI) Ch - 8, Pg. 133

Riibosomes are the granular structures mainly composed of RNA and proteins. They are not surrounded by any membrane.

43. (c) NCERT (XI) Ch - 8, Pg. 129

Flagella aids motility. While pili and fimbriae do not play a role in motility.

44. (c) Microfilament has a diameter of 5-7 nm and made up of single monomer.

45. (c) NCERT (XI) Ch - 8, Pg. 134

Vacuoles are meant for osmoregulation.

46. (a) NCERT (XI) Ch - 8, Pg. 128

Mesosome helps in respiration in prokaryotes analogous to mitochondria.

47. (b) NCERT (XI) Ch - 8, Pg. 137

Centriole - Basal body cilia on flagella

Chlorophyll - Thylakoid

Cristae - Infoldings in mitochondria

Ribozymes - Nucleic acid

48. (a) NCERT (XI) Ch - 8, Pg. 133

SER: Ribosome absent, involved in lipid synthesis

RER: Ribosome present, involved in protein synthesis

49. (c) NCERT (XI) Ch - 8, Pg. 133

SER is the site for lipid synthesis.

50. (a) NCERT (XI) Ch - 8, Pg. 134

Major role in post translational modification of protein and glycosidation of lipids. It also help in packaging.

51. (a) NCERT (XI) Ch - 8, Pg. 135

Centriole - Helps in cell division

Nucleolus - Sites for active RNA synthesis

Lysosome - Acidic pH

52. (a) NCERT (XI) Ch - 8, Pg. 126

Ribosome is found within two organelles - chloroplasts (in plants) and mitochondria.

53. (a) NCERT (XI) Ch - 8, Pg. 132

The detailed structure of the membrane was studied only after the advent of the electron microscope in the 1950s. An improved model of the structure of cell membrane was proposed by Singer and Nicolson (1972) widely accepted as fluid mosaic model.

In human beings, the membrane of the erythrocyte has approximately 52 per cent protein and 40 per cent lipids.

The lipids are arranged within the membrane with the polar head towards the outer sides and the hydrophobic tails towards the inner part. This ensures that the nonpolar tail of saturated hydrocarbons is protected from the aqueous environment.

Na^+ and K^+ ions move across cell membrane by active transport.

54. (c) NCERT (XI) Ch - 8, Pg. 129

Ribosomes are non-membrane bound organelles found in all cells – both eukaryotic as well as prokaryotic. In prokaryotes, ribosomes are associated with the plasma membrane of the cell. They are about 15 nm by 20 nm in size and are made of two subunits - 50S and 30S units which when present together form 70S prokaryotic ribosomes. Ribosomes are the site of protein synthesis. Ribosomes are composed of ribonucleic acid and proteins

55. (a) Cell membrane of prokaryotes is structurally similar to that of eukaryotes. So, it does not differ in *E.coli* and *Chlamydomonas*.

56. (c) NCERT XI Ch - 8, Pg. 138

Ribosomes are the site of protein synthesis. Nucleolus is a site of active ribosomal RNA synthesis.

57. (d) NCERT (XI) Ch - 8, Pg. 135

The inner compartment is called the matrix. The outer membrane forms the continuous limiting boundary of the organelle. The inner membrane forms a number of infoldings called the cristae (sing.:crista) towards the matrix. The cristae increase the surface area.

58. (d) NCERT (XI) Ch - 8, Pg. 132-133

The endomembrane system includes endoplasmic reticulum (ER), Golgi complex, lysosome and vacuoles. Since the functions of the mitochondria, chloroplast and peroxisomes are not coordinated with the above components; these are not considered as part of the endomembrane system.

59. (c) NCERT (XI) Ch - 8, Pg. 126

E.coli is a prokaryotic bacterium.

60. (a) NCERT (XI) Ch - 8, Pg. 136

The guard cells possess chloroplasts and regulate the opening and closing of stomata.

61. (a) NCERT (XI) Ch - 8, Pg. 133

Ribosomes are the site of peptide synthesis. Ribosomes are the granular structures first observed under the electron microscope as dense particles by George Palade (1953). They are composed of ribonucleic acid (RNA) and proteins and are not surrounded by any membrane.

62. (c) NCERT (XI) Ch - 8, Pg. 133

Golgi apparatus is the important site of formation of glycoproteins and glycolipids.

ABOUT PHYSICS WALLAH




Alakh Pandey is one of the most renowned faculty in NEET & JEE domain's Physics. On his YouTube channel, Physics Wallah, he teaches the Science courses of 11th and 12th standard to the students aiming to appear for the engineering and medical entrance exams.

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