

For BioResire students



NEET Biology Material

Elite Batch

Website: www.bioresire.in

Contact: +91-6301352398

info@bioresire.in

CELL ORGANELLES

Cell membrane Model given by Singer & Nicolson (fluid mosaic model): cell membrane is selectively permeable.

Cell wall Gives shape to the cell, found in fungi & plants.

Middle lamella Hold neighboring cells together, made of calcium pectate

Endoplasmic Reticulum (ER) — Network of tiny tubular structures scattered in cytoplasm: ER can be smooth ER — without ribosomes & rough ER with ribosomes. RER involved in protein synthesis. SER is major site for synthesis of lipids.

Golgi apparatus First observed by Camillo Golgi - consists of flat, disc shaped sacs or cisternae; cisternae arranged near the nucleus with distinct convex (cis) or forming face concave (trans) or maturing face.

Lysosomes - Membrane bound vesicles filled with hydrolytic enzymes (hydrolases, lipases).

Vacuoles - Membrane bound space filled with water, sap & excretory products.

Mitochondria is double membrane layered structure that are site of aerobic respiration, produce cellular energy in the form of ATP, called power house of cell.

Plastids - Found in plant cells, bear specific pigments, 3 types: chloroplasts, chromoplasts & leucoplasts.

Ribosomes - Granular structure composed of RNA & proteins, not surrounded by membrane. Eukaryotic ribosomes 80S; Prokaryotic, ribosomes 70S, 80S divided into 60S & 40S, 70S divided into 50S & 30S.

Cytoskeleton - Network of filaments in cytoplasm, helps in mechanical support & maintaining shape.

Cilia & Flagella are hair like outgrowths, cilia are smaller than flagella, help in cell movement.

Centrosome - Organelle with 2 cylindrical structures centrioles, help in cell division (formation of spindle fibres).

Nucleus - Discovered by Robert Brown, controls activities of cell & its organelles, major role in heredity.

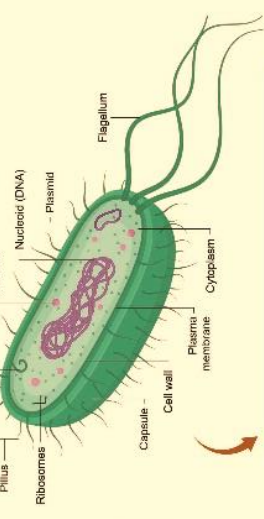
Microbodies - Minute vesicles filled with enzymes.

Rudolf Virchow gave the concept of omnis cellula-e-cellula

Structural & functional unit of all living organisms

PROKARYOTIC CELLS (Lack nucleus)

EUKARYOTIC CELLS (Nucleus is present)



Cell wall determines the shape of cell

Capsule (gummy or sticky) protects from host's immune system.

Flagella helps in locomotion (hair filamentous structure); has 3 parts: filament, hook & basal body.

Pili: no role in motility; help in mating process.

Mesosomes: extension of plasma membrane in cell; helps in cell wall formation, DNA replication.

Nucleoid has irregular shape; consists of genetic material (naked).

Cell envelope 3 layered structure

on the basis of staining bacteria can be

Gram positive	Gram negative
take up Gram stain	do not take gram stain
	stain

Prokaryotic cells lack membrane-bound cell organelles

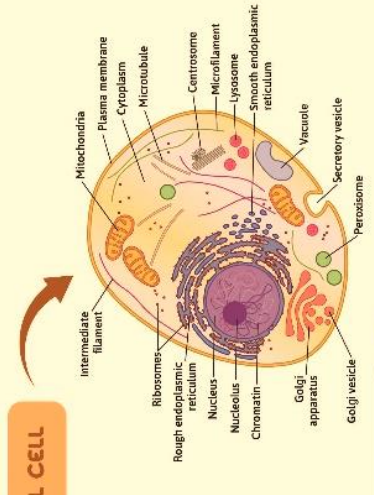
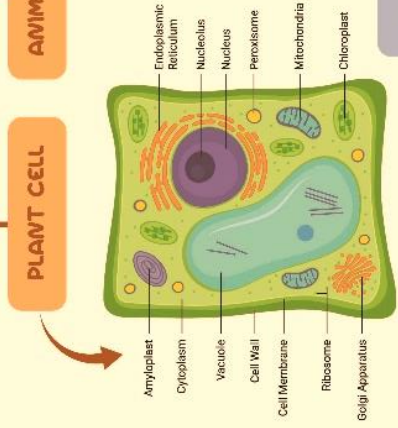
Genetic material - Genomic DNA (circular DNA) + Small circular DNA (plasmids)

Ribosomes 70S (50S and 30S units); help in protein synthesis.

First live cell discovered by Anton von Leeuwenhoek

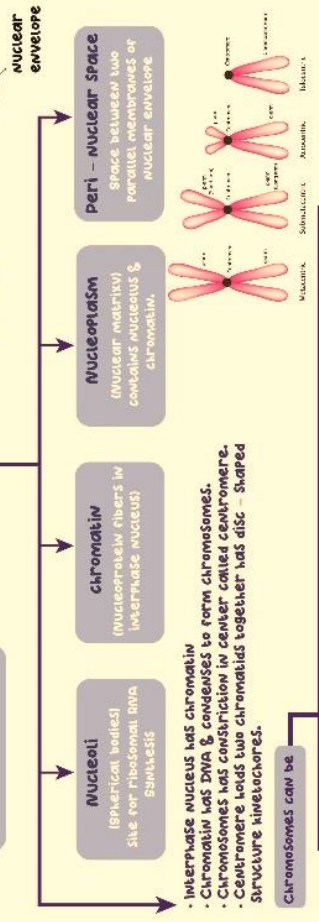
DIFFERENT SHAPES OF CELLS

- Red blood cells (round & biconcave)
- White blood cells (branched & long)
- Columnar epithelial cells (long & narrow)
- Nerve cells (branched & long)
- A tracheid (elongated)
- Mesophyll cells (round & oval)



NUCLEUS

Controlling unit of the cell



Interphase nucleus has chromatid

Chromatin has DNA & condenses to form chromosomes.

Chromosomes has condensation in center called centromere.

Centromere holds two chromatids together, has disc-shaped structure kinetochores.

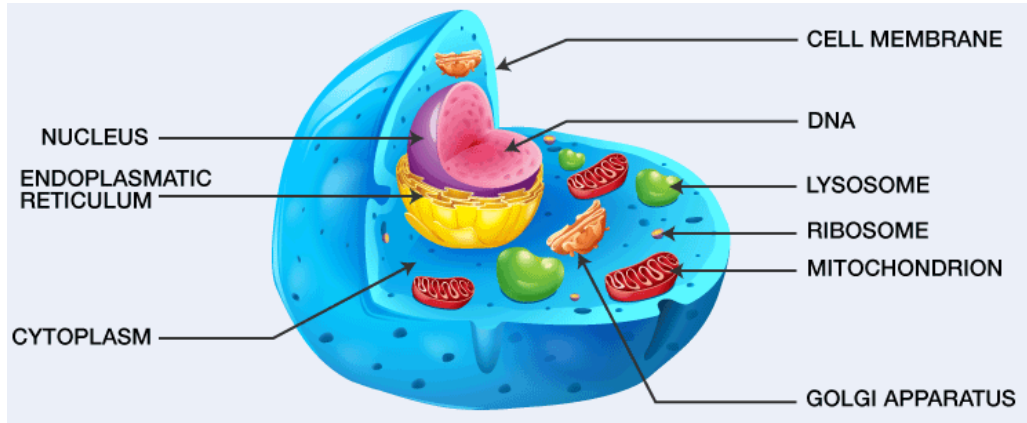
Chromosomes can be

Metacentric	Sub-metacentric	Acrocentric	Telocentric
Centromere in middle	Centromere slightly away from middle	Centromere close to end	Centromere at terminal

CELL THE UNIT OF LIFE

Cell

A cell is defined as the most basic, structural and functional unit of all living organisms. Essentially, a cell is a structure that contains organelles which provide necessary functions to sustain itself. However, not all cells are the same.

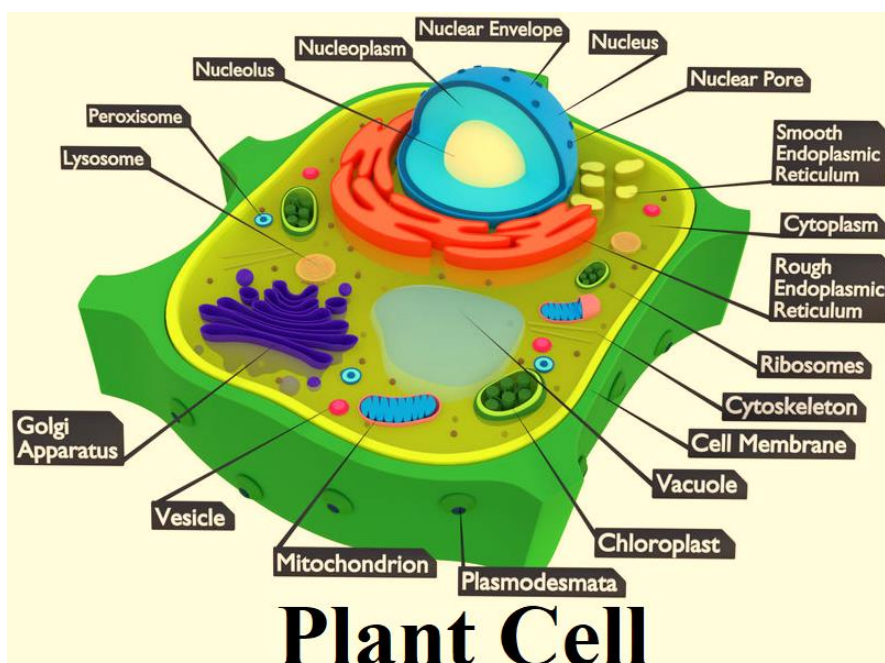


Prokaryotic cells

- Membrane-bound nucleus is absent.
- Cells are smaller in size.
- Single chromosome is present.
- Membrane-bound organelles are absent.

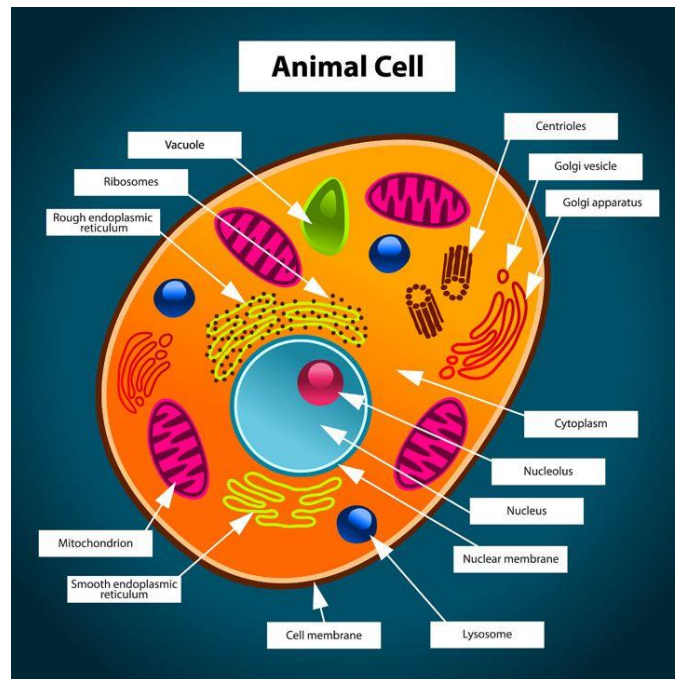
Eukaryotic cells

- Membrane-bound nucleus is present.
- Cells are larger in size.
- More than one chromosome is present.
- Membrane-bound organelles are present.



Animal cell

- Cell membrane is composed of lipids that are arranged in bilayer. The lipid component is mainly composed of phosphoglycerides. Later it was found that protein is also present in cell membrane. Ratio of protein and lipids varies in different cells.
- Membrane protein may be integral or peripheral. Integral protein remains buried in membrane but peripheral protein lies on the surface.
- Singer and Nicholson (1972) proposed fluid mosaic model. According to this model, the quasi-fluid nature of lipid enables lateral movement of protein within the bilayer of lipids.



Eukaryotic cells: Eukaryotic cells Possess an organized nucleus with nuclear envelope and have a variety of complex locomotory and cytoskeletal structures.

Active Transport

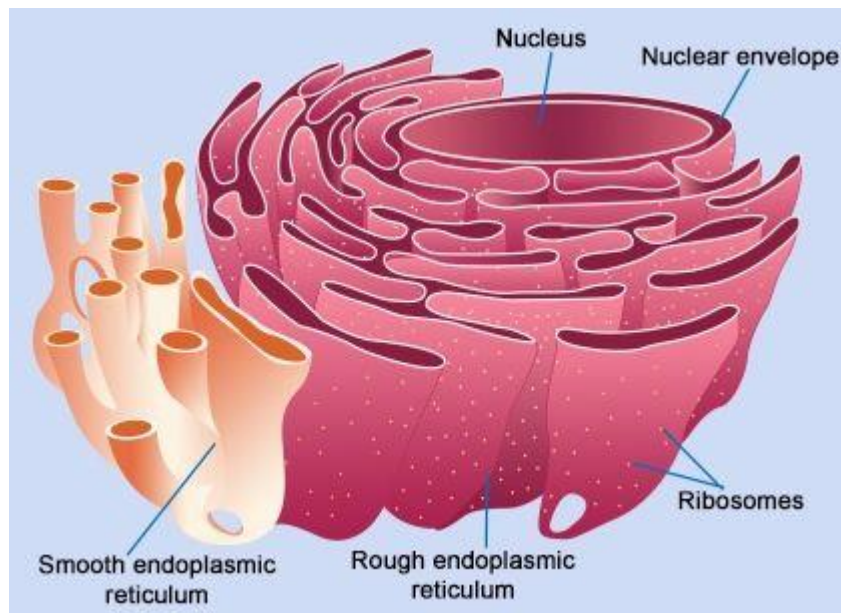
The transport involves an expenditure of energy by the cells, It occurs against the concentration gradient. It is a rapid process.

Passive Transport

The cells do not spend energy in passive transport, this transport is always along the concentration gradient. It is comparatively slow process.

Endoplasmic Reticulum

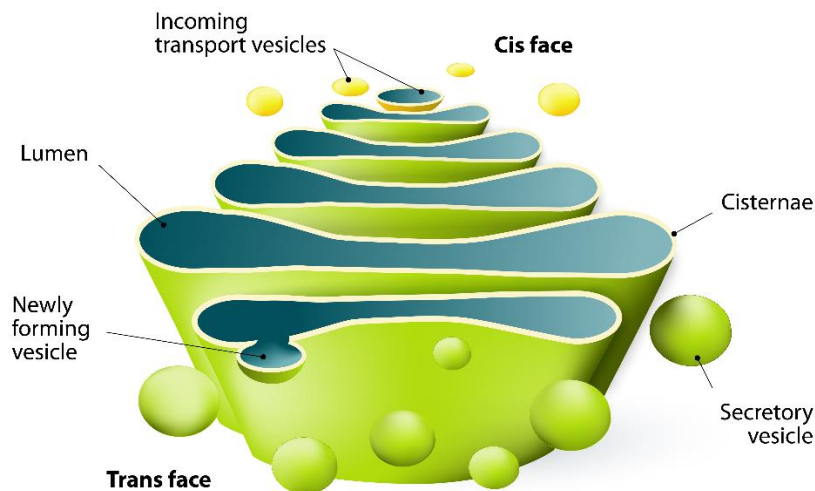
Endoplasmic Reticulum are the tubular structure scattered in the cytoplasm. Rough endoplasmic reticulum bears ribosomes on its surface. RER is involved in protein synthesis and secretion. Smooth endoplasmic reticulum does not bear ribosomes on its surface. SER is involved in lipid synthesis and steroidal hormones.



Golgi apparatus

Golgi apparatus was first observed by Camillo Golgi in 1898 near nucleus. They consist of many flat, disc-shaped sacs or cisternae stacked parallel to each other. Golgi apparatus performs the function of packaging of materials and its transportation. A number of protein synthesized by ribosomes are modified in cisternae of Golgi apparatus. Golgi apparatus is the site for synthesis of Glycoproteins and glycolipids.

Golgi Apparatus



Lysosomes

Lysosomes are membrane-bound vesicular structures formed by the process of packaging in the Golgi apparatus. They are rich in hydrolytic enzymes- lipase, protease, carbohydrates active at acidic PH. These enzymes are capable of digesting carbohydrates, proteins, lipids, and nucleic acids.

Vacuoles

Vacuoles are membrane-bound space found in cytoplasm containing water, sap and excretory product. They are bound by single membrane. They form contractile vacuole and food vacuole in many organisms.

Mitochondria

Mitochondria is double membrane-bound structure with the outer membrane and inner membrane dividing its lumen in two compartments. The inner membrane forms a number of infoldings called cristae towards the matrix.

Plastids

Plastids are found in plant cells and in Euglenoids.

Plastids are three types:

Chloroplast (Contain chlorophyll and caratenoids).

Chromoplast (Contain carotene and xanthophyll).

Leucoplast (Colorless plastids).

- **Chloroplast:** Contains chlorophyll pigment and carotenoids and performs photosynthesis
- **Chromoplast:** Contains carotene and xanthophylls. They impart a specific color to flowers and fruits and help in pollination and dispersal of seeds
- **Leucoplast:** They are colorless and store various food products, e.g., amyloplasts- store starch, proteinoplasts or aleuroplasts- store proteins, elaioplasts- store fat.

NCERT LINE BY LINE QUESTIONS

Cell Structure and Function

1. In living organisms detailed description that brings out their knowledge of diversity is about **Pg-125, easy**
A) Their form
B) Their appearance
C) Both
D) None
2. What brought out the unit of diversity the cellular organisation of all life form: **Pg-125, easy**
A) Theory of evolution
B) Species theory
C) Cell theory
D) Darwinian theory
3. What is not true about physico-chemical approach:- **Pg-125, easy**
A) Established by analysis of living tissue for element and compounds.
B) Explains what type of organic compounds is present in living organism.
C) Explains the abnormal process that occur during any diseased condition.
D) This approach is known as forward biology.

Cell :- The Unit Of Life

4. Unicellular organism are capable of **Pg-125, easy**
A) Independent existence
B) Performing the essential functions of life.
C) Both
D) Does not ensure independent living
5. Living cell was firstly seen and described by:- **Pg-125, easy**
A) Robert Hooke
B) Anton von Leeuwenhoek
C) Robert Koch
D) Robert Brown

Paragraph - 8.2

Cell Theory

6. Cell theory was proposed by:- **Pg-126, easy**
A) Matthias Schleiden and Theodore Schwann
B) Schleiden; Schwann and Virchow.
C) Rudolf Virchow
D) Sutton and Boveri
7. All the plants are composed of different kinds of cells which forms the tissue of the plant, this statement was given by:- **Pg-125, easy**
A) A German botanist ; Rudolf Virchow .
B) A British zoologist ; Matthias Schleiden
C) A British zoologist ; Theodore Schwann
D) A German botanist; Matthias Schleiden
8. Who studied the different types of animal cells to propose cell theory:- **Pg-126, easy**
A) A British zoologist; Matthias Schleiden
B) A German botanist; Theodore Schwann.
C) A physicist; Rudolf Virchow.
D) A British zoologist; Theodore Schwann.
9. A thin outer layer studied by Theodore Schwann nowadays known as:- **Pg-126, easy**
A) Plasma membrane
B) Cell wall
C) Glycocalyx
D) Middle lamella
10. Based on studies of Matthias Schleiden; what is the unique character of plant cell? **Pg-126, easy**
A) Cell wall
B) Middle lamella
C) Glycocalyx
D) None of these

11. The hypothesis that the bodies of animals and plant are composed of cells and their products was proposed by:- **Pg-126, easy**
 A) Schleiden and Schwann B) Rudolf Virchow
 C) Schwann only D) Virchow and Schleiden
12. Scientist who gave the final shape to cell theory? **Pg-126, easy**
 A) Schleiden B) Schwann
 C) Virchow D) Schleiden & Schwann
13. Which of the following is related to cell theory :- **Pg-126, medium**
 i) All living organisms are composed of cells and product of cells.
 ii) Proposed by Schleiden and Schwann.
 iii) Modified by Rudolf Virchow
 iv) All cells arise from pre - existing cell.
 v) "Omnis cellula - e - cellula"
 A) Only one of the above B) Only two of the above
 C) Only four of the above D) All five

Paragraph - 8.3 An Overview of Cell

14. What is the delimiting boundary around a human cheek cell? **Pg-126, easy**
 A) Cell membrane B) Protoplasm
 C) Protoplast D) Cell wall
15. What is the Semi - fluid matrix inside the cell? **Pg-126, easy**
 A) Cell membrane B) Protoplast
 C) Cytoplasm D) Nucleus
16. How many of the following statements are not true:- **Pg-126, medium**
 i) All cells have membrane bound nuclei and nucleolus.
 ii) Nucleus contains the chromosome
 iii) DNA is the Genetic material.
 iv) Cytoplasm is the main arena of cellular activities in plant and animal cells.
 A) Only (ii), (iii), & (iv) B) Only (ii) & (iv)
 C) Only (i) & (iii) D) Only (i)
17. Besides the nucleus; the _____ cell have other membrane bound distinct structures.
 A) Eukaryotic B) Prokaryotic
 C) Both (a) and (b) D) None of these **Pg-126, easy**
18. What is the non - membranous organelle present in both Eukaryotic as well as Prokaryotic cell **Pg-126, easy**
 A) Endoplasmic reticulum B) Protein
 C) Mitochondria D) Ribosomes of 80s' type
19. Animal cells have another non - membrane bound cellular organelle known as:- **Pg-126, easy**
 A) Microbodies B) Nucleus
 C) Lysosome D) Centrosome
20. Which of the following is not incorrect? **Pg-127, medium**
 A) Mycoplasma is the smallest cell -> 0.3 μm in width.
 B) Bacteria could be 3 μm to 5 μm in length
 C) Human RBCs are about 7.0mm in diameter.
 D) Cell's shape is independent of their work they perform.

Paragraph - 8.4 Prokaryotic Cell

21. The prokaryotic cells are represented by:- **Pg-127, easy**
 A) Bacteria B) BGA
 C) Mycoplasma & PPLO D) All of these
22. All prokaryotic cell have this cellular boundary surrounding the cell - membrane except in mycoplasma **Pg-127, easy**
 A) Glycocalyx B) Protoplast
 C) Cell wall D) Cytoplasm
23. Which of the following is related to prokaryotic cell:- **Pg-127, easy**
 A) Have no well defined nucleus
 B) Have basically naked genomic material.
 C) An addition to genomic DNA; the extra - genomic DNA is also present known as plasmid.
 D) All of the above
24. Which of the following confirms certain unique phenotypic characters to some bacteria **Pg-127, easy**
 A) Chromosomal material
 B) Extra chromosomal material
 C) Mitochondrial DNA
 D) Genetic material present in chloroplast
25. A special form of cell membrane ; which is the characteristic of prokaryotes is:- **Pg-128, easy**
 A) Plasmid B) Cell wall
 C) Cell membrane D) Mesosomes.
26. Which of the following is membrane less bodies other than Ribosomes. **Pg-128, easy**
 A) Cell wall B) Inclusion
 C) Mesosomes D) Chromatophores
27. Which of the following is the essential infolding's of cell membrane **Pg-128, easy**
 A) Inclusion B) Mesosome C) Chromatophores D) Plasmid
- Paragraph - 8.4.1**
Cell Envelope and it's modification
28. What is the sequence of cell envelope in most of the prokaryotic cell (Outer to Inner) **Pg-128, easy**
 A) Glycocalyx ->cell membrane -> cell wall.
 B) Cell membrane -> cell wall -> Glycocalyx
 C) Cell wall -> Glycocalyx -> cell membrane
 D) Glycocalyx ->cell wall -> cell membrane.
29. The prokaryotic cell have a single protective unit made up of **Pg-128, easy**
 A) Glycocalyx + cellulosic cell wall + cell membrane
 B) Peptidoglycan cell wall + cell membrane + Glycocalyx
 C) Chitinous cell wall + cell membrane + Glycocalyx
 D) Silicious cell wall + Glycocalyx + cell membrane
30. How many of the following statements are correct:- **Pg-128, easy**
 i) Glycocalyx is outermost layer.
 ii) All three layer have same function.
 iii) Bacteria can be classified on the basis of differences in the cell envelope.
 iv) Bacteria can be classified on the basis of response to the staining procedure
 A) Only one B) Only two C) Only three D) All four
31. The bacteria that take up gram stain are **Pg-128, easy**
 A) Gram positive type. B) Gram negative type.

- C) Both type
D) Neither gram positive nor gram negative.
32. The bacteria that do not take up gram stain are **Pg-128, easy**
A) Gram positive type. B) Gram negative type.
C) Either gram positive or gram negative
D) Neither gram positive nor gram negative
33. Which of the following in a bacterial envelope is a loose sheath of slimy layer **Pg-128, easy**
A) Glycocalyx B) Cell wall C) Cell membrane D) None of the above
34. Glycocalyx could be a thick and tough layer and known as:- **Pg-128, easy**
A) Slimy layer B) Cyst
C) Capsule D) None of the above
35. Which of the following determines the shape of a bacteria cell:- **Pg-128, easy**
A) Glycocalyx B) Capsule
C) Cell membrane D) Cell Wall
36. How many of the following is not incorrect regarding a cell membrane in prokaryotes **Pg-128, medium**
i) Selectively permeable in nature
ii) Structurally similar to eukaryotic cell membrane
iii) Interacts with outer world.
iv) Innermost layer of cell envelope
v) Living layer.
A) Only (ii), (iii) & (iv) B) Only (i), (ii), (iii), (iv) & (v)
C) Only (i), (iii), (iv) & (v) D) Only (i), (iv) & (v)
37. How many of the following is the membranous extensions into the cell of bacteria:- **Pg-128, easy**
Mesosomes, Tubules, Vesicles, Lamellae, Chromatophores, Inclusions
A) 6 B) 3 C) 5 D) 4
38. How many functions from the following, the mesosomes can perform **Pg-129, easy**
i) DNA replication ii) Respiration
iii) DNA distribution to daughter cells iv) Secretion
v) Increases surface area vi) Contains enzymatic content.
A) Only four B) Only Three
C) All six D) Only five
39. In cyanobacteria, there are some another membranous extensions except mesosomes are: **Pg-129, easy**
A) Inclusion B) Fat globules
C) Chromatophores D) All of the above
40. What are structures related to Bacterial flagellum:- **Pg-129, easy**
A) Basal body & filament B) Basal body, Hook & filament.
C) Hook & filament D) Filament only.
41. Longest portion of flagellum is:- **Pg-129, easy**
A) Basal body B) Hook
C) Filament D) None of the above
42. Which of the following structure helps in motility in bacterial cell:- **Pg-129, easy**
A) Cell membrane B) Pili
C) Fimbriae D) Flagella
43. Which of the following is not a surface structure :- **Pg-129, easy**
A) Fimbriae B) Pili C) Flagella D) Inclusion

- i) Phospholipid
 iii) Proteins
 v) Phosphoproteins
 A) Only (i), (ii) & (iv)
 C) Only (ii), (iii), (iv) & (v)
- ii) Carbohydrate
 iv) Cholesterol
 B) Only (ii), (iv) & (v)
 D) Only (i), (ii), (iii) & (iv)
65. Which of the following study revealed that cell membrane also contains proteins & carbohydrate:- **Pg-131, easy**
 A) Electron microscopic study.
 B) Phase - Contrast microscopic study.
 C) Biochemical investigation study
 D) Cobalt - chloride paper test study.
66. Which of the following statement is incorrect:- **Pg-131, easy**
 A) The tail is hydrophobic of saturated hydrocarbons.
 B) The tail is hydrophilic of saturated hydrocarbons.
 C) The tail is hydrophobic of unsaturated hydrocarbons.
 D) The tail is hydrophilic of unsaturated hydrocarbons
67. Which of the following statement is incorrect:- **Pg-131, easy**
 A) The ratio of proteins and lipids varies considerably in different cells.
 B) In erythrocytes; it has approximately 52% proteins and 40% lipids.
 C) On the basis of ease of extraction membrane proteins are of extrinsic and intrinsic type.
 D) None of the above
68. The improved model of the structure of cell membrane was proposed by:- **Pg-132, easy**
 A) Messelson & Stahl
 C) Anton von Leeuwenhoek
 B) Schleiden & Schwann
 D) Singer and Nicholson
69. The quasi-fluid nature of lipid enables:- **Pg-132, easy**
 A) Flip-flop movement of proteins within the lipid bilayer.
 B) Lateral movement of proteins within the lipid bilayer.
 C) Flip-flop movement of lipid crossing the protein bilayer.
 D) lateral movement of lipid crossing the protein bilayer.
70. One of the most important function of the plasma membrane is:- **Pg-132, easy**
 A) Transport of molecules across it.
 C) Secretion
 B) Flip - flop movement.
 D) Cell enlargement.
71. What ability explains the fluidity of cell membrane:- **Pg-132, easy**
 A) Quasi - fluid nature of cell membrane.
 B) Lateral movement of proteins.
 C) Cell growth, formation of intercellular junctions; secretion; endocytosis; cell division
 D) All of the above.
72. The plasma membrane is:- **Pg-132, easy**
 A) Semi - permeable in nature
 C) Impermeable in nature
 B) Impervious in nature
 D) Selectively permeable in nature.
73. How many of the following functions the cell membrane can perform:- **Pg-132, easy**
 Active transport; Osmosis; Passive transport.
 A) Only one
 B) Only two
 C) All
 D) None
74. Na⁺ - K⁺ pump transports molecules **Pg-132, easy**
 A) By passive transport
 C) By utilisation of ATP
 B) By active transport
 D) Both B & C

Paragraph - 8.5.2
Cell Wall

75. The outer covering of fungi and plants is:- **Pg-132, easy**

- A) Glycocalyx B) Cell wall C) Cell membrane D) All
76. What is the function of cell wall:- **Pg-132, easy**
 A) Gives shape to the cell B) Protects the cell
 C) Cell - to - cell interaction D) All of the above
77. What are chemical composition of algal cell wall
 Cellulose, Galactans, Mannans, Calcium carbonate, Chitin **Pg-132, easy**
 A) Only two of them B) Only three of them
 C) Only four of them D) All five of them
78. Cell wall of plants consists of:- **Pg-132, easy**
 A) Cellulose & Pectin's only
 B) Cellulose, hemicellulose & Pectin's only
 C) Cellulose, hemicellulose, Pectin & Proteins.
 D) Hemicellulose & Proteins only.
79. Which of the following is capable of growth **Pg-132, easy**
 A) Primary cell wall B) Secondary cell wall
 C) Tertiary cell wall D) All of them
80. Secondary cell wall is formed **Pg-132, easy**
 A) Outside the primary cell wall. B) Inside the cell membrane
 C) Inside the plasmodesmata. D) Inside the primary cell wall.
81. Which of the following in plant acts as glue between neighbouring plant cells:- **Pg-132, easy**
 A) Ca - Pectate B) Mg - Pectate
 C) Ca & Mg - Pectate D) None of the above
82. Which of the following is traversed by plasmodesmata:- **Pg-132, easy**
 A) Cell wall & cell membrane
 B) Cell membrane & Glycocalyx
 C) Cell membrane, cell wall, Glycocalyx & Middle lamella.
 D) Cell wall & middle lamella.

Paragraph - 8.5.3 Endomembrane System

83. What are the constituent of Endomembrane system:- **Pg-133, easy**
 A) Endoplasmic reticulum B) Golgi body & E.R.
 C) E.R; Golgi body; Lysosome & Vacuole. D) E.R, Golgi body & Lysosome.
84. Why Mitochondria, Chloroplast & Peroxisome are not the part of Endo - system:- **Pg-133, easy**
 A) They are autonomous organelles.
 B) They are semi - autonomous organelles.
 C) They are not coordinated with Endomembrane system.
 D) They have their own genetic material.
85. Which of the following is the network of tiny-tubular structure scattered in cytoplasm:- **Pg-133, easy**
 A) E.R B) Golgi body C) Lysosome D) Vacuole
86. Which of the following structure divides the intercellular space into two compartments:- **Pg-133, easy**
 A) E.R B) Golgi body C) Lysosome D) None of the above
87. The extra luminal & luminal compartment represents:- **Pg-133, easy**
 A) Cytoplasm & inside ER B) Inside ER & cytoplasm
 C) Outside ER & cytoplasm D) Cytoplasm & outside ER
88. The ER having Ribosomes attached to its outer surface is known as **Pg-133, easy**

- A) RER B) SER C) Both D) None
89. RER is frequently observed in cells, actively involved in:- **Pg-133, easy**
 A) Protein Synthesis B) Lipid synthesis
 C) DNA synthesis D) Glucose synthesis
90. Which of the following is continuous with the outer membrane of nucleus:- **Pg-133, easy**
 A) R.E.R B) S.E.R C) Golgi body D) Lysosome
91. Steroidal hormones are synthesised by:- **Pg-133, easy**
 A) R.E.R B) Lysosome C) S.E.R D) Ribosome
92. Golgi body was firstly observed by **Pg-133, easy**
 A) Camillo Golgi in 1898 B) Camillo Golgi in 1897
 C) Camillo Golgi in 1895 D) Camillo Golgi in 1993.
93. Golgi body is **Pg-133, easy**
 i) Reticular structure. ii) Densely stained structure
 iii) Made up of cisternae, Tubule & Vesicle
 iv) Concentric cisternae
 A) Only (i) & (iii) B) Only (ii), (iii) & (iv)
 C) All of the above D) Only (iii) & (iv)
94. What is the diameter of cisternae of Golgi body:- **Pg-133, easy**
 A) 0.5µm to 1.0µm B) 0.1 µm to 2.0 µm
 C) 0.2 µm to 2.5 µm D) 0.3 µm to 2.0 µm
95. The convex - face of cisternae of Golgi body is also known as:- **Pg-134**
 i) Cis - face ii) Forming face iii) Trans - face iv) Maturing face
 A) (i) & (ii) B) (ii) & (iii) C) (iv) & (iii) D) (i) & (iv)
96. Which of the following statement is correct:- **Pg-134, easy**
 A) Cis & Trans faces are same but inter connected.
 B) Cis & Trans faces different & not inter connected
 C) Cisternae is 0.1 to 2.0 µm in diameter.
 D) None of the above
97. Golgi body principally performs the functions of:- **Pg-134, easy**
 A) Secretion B) Packaging of materials.
 C) Both D) None
98. Materials to be packed in the _____ Fuses with the _____ face:- **Pg-134, easy**
 A) Cis - face and Trans - face
 B) Trans - face and cis - face
 C) E.R and cis - face
 D) E.R and trans - face
99. A number of proteins synthesized by ribosomes on the _____(i)_____ are modified **Pg-134, easy**
 in the _____(ii)_____ of the _____(iii)_____
 A) (i) ER (ii) Golgi body (iii) cisternae
 B) (i) Golgi body (ii) cisternae (iii) ER
 C) (i) cisternae (ii) RE (iii) Golgi body
 D) (i) ER (ii) cisternae (iii) Golgi body
100. The vesicular structure formed by the process of packing in Golgi apparatus is:- **Pg-134, easy**
 A) Vacuole B) ER C) Lysosome D) All
101. The isolated lysosomal vesicle have been found to be very rich in **Pg-134, easy**
 i) Lipases ii) Proteases iii) Carbohydrases
 A) Only i) & ii) B) Only ii) & iii) C) Only i) & iii) D) All
102. Enzymes present in lysosomes are accumulatively known as:- **Pg-134, easy**

- A) Acid proteases B) Lipases C) Acid hydrolases D) Carbohydrases
103. The membrane bound space in cytoplasm is known as:- **Pg-135, easy**
 A) ER B) Golgi body C) Lysosome D) Vacuole
104. Vacuole contains hydrolases; lipases; proteases; water; sap; excretory products & material not useful for the cell **Pg-135, easy**
 A) Only four of the above B) Only three of the above
 C) Only five of the above D) All of them.
105. The membrane of vacuole is **Pg-134, easy**
 A) Single membrane B) Tonoplast C) Both D) none
106. In a plant cell vacuole can occupy up to _____% space of cell **Pg-134, easy**
 A) 70 B) 80 C) 90 D) 50
107. In plant tonoplast facilitates the transport of a number of ___(i)___; ___(ii)___ the concentration gradient. **Pg-134, easy**
 A) (i) Solutes (ii) Along B) (i) ions (ii) Along
 C) (i) ions (ii) against D) (i) solutes (ii) against
108. How many of the following statements are not wrong:- **Pg-134, medium**
 i) Concentration of same ions inside the vacuole is significantly higher.
 ii) In amoeba contractile vacuole helps in osmoregulation & excretion.
 iii) In Protistans, food vacuoles are formed by engulfing the food particle.
 A) Only two B) Only one C) All three D) None

Paragraph - 8.5.4 Mitochondria

109. Which of the following statement is correct about mitochondria:-**Pg-134, medium**
 A) Easily visible under the microscope; without stain.
 B) Number of mitochondria per cell is invariable
 C) Number of mitochondria depends on the physiological activity of cell.
 D) All of the above.
110. How many of the following statement is correct regarding mitochondria- **Pg-134, medium**
 i) A sausage - shaped str. ii) Diameter is 0.2 - 1.0 μm
 iii) Avg. Diameter is 0.5 μm iv) Length is 1.0 - 4.1 μm
 A) One B) Two C) Three D) Four
111. Each mitochondria is ___X___ membrane bound structure; dividing its lumen into ___Y___ distinct compartment **Pg-135, easy**
 A) X→ single Y→one B) X →double Y→one
 C) X→single Y→two D) X → double Y→two
112. Matrix of mitochondria is:- **Pg-135, easy**
 A) Filled with a dense homogenous substance.
 B) Outer aqueous compartment
 C) Space present between Inner and Outer membrane of Mitochondria
 D) Present within the outer membrane of mitochondria
113. The outer membrane of mitochondria forms the ___ limiting boundary of the organelle, while the inner membrane forms a number of___ **Pg-135, easy**
 A) Discontinuous ; infoldings B) Infoldings; Cristae
 C) Continuous ; Cristae D) Cistae ; Infoldings
114. Which of the following increase the surface area:- **Pg-135, easy**
 A) Matrix B) Inner membrane
 C) Outer membrane D) Cristae
115. How many of the following statements are correct:- **Pg-135, easy**
 i) Only outer membrane has enzyme for ETS

- ii) Only inner membrane has enzymes.
 - iii) Outer membrane is devoid of enzymes.
 - iv) Mitochondria matrix has enzyme of kerb's cycle.
 - v) Mitochondria is the site of aerobic respiration
 - vi) Matrix also possess SS - DNA molecule & few RNA molecules.
- A) Only two B) Only four C) Only five D) Only three
116. The matrix of mitochondria possess:- **Pg-135, easy**
 Single circular DNA molecules; A few RNA molecules; 70s' ribosomes;
 Components required for the synthesis of proteins.
 A) Only two of them B) Only three of them
 C) All of them D) None of them
117. Mitochondria divides by:- **Pg-135, easy**
 A) Endomitosis B) Meiosis C) Budding D) Fission

Paragraph - 8.5.5 Plastids

118. Plastids are found in:- **Pg-135, easy**
 A) Only plants cells B) Only Euglenoids
 C) Both Plants and Euglenoids D) Plants; Euglenoids & Cyanobacteria.
119. Classification of plastids are based on- **Pg-135, easy**
 A) Chromatophores B) Mesosomes
 C) Inclusions D) Pigments
120. Which of the following is responsible for trapping of light energy **Pg-135, easy**
 A) Chlorophyll like a, b, c etc. B) Carotenoids
 C) Chlorophylls & carotenoids D) Chromosomes
121. Carotenoids is group of **Pg-135, easy**
 A) Chlorophyll pigments B) Chlorophylls & carotene
 C) Carotenes and xanthophyll's
 D) Carotenes ; xanthophyll's & other pigments.
122. Leucoplast is :- **Pg-135, easy**
 A) Unmodified plastids B) Contains stored nutrients
 C) Imparts colour to the plant cell D) Imparts colour to the cyanobacteria
123. What are types of chloroplast:- **Pg-135, easy**
 i) Chromoplast ii) Leucoplast
 iii) Amyloplast iv) Aleuroplast
 v) Elaioplast
 A) Three of the above B) Four of the above
 C) Five of the above D) None of the above
124. Elaioplast contains **Pg-135, easy**
 A) Proteins and fats B) Fats and starch
 C) Fats and oils D) Fats ; Protein and oils.
125. Aleuroplast contains **Pg-136, easy**
 A) Proteins and fats B) Fats and oils
 C) Proteins & starch D) Protein only
126. Majority of chloroplast of the green plants are found in :- **Pg-136, easy**
 A) Mesophyll cells of roots B) Mesophyll cells of stems
 C) Mesophyll cells of leaves D) Mesophyll cells of flowers.
127. Mesophyll cells are:- **Pg-136, easy**
 A) Lens - shaped; Oval; Spherical only
 B) Oval & spherical only
 C) Discoidal & ribbon - shaped

- D) None of them
128. What is dimension of chloroplast :- Pg-136, easy
 A) Length 2 - 4 μm & width 5 - 10 μm
 B) Length 1 - 2 μm & width 2 - 4 μm
 C) Length 5 - 10 μm & width 2 - 4 μm
 D) Length 2 - 4 μm & width 1 - 2 μm
129. Number of chloroplast per cell may vary from _____ per cell of chlamydomonas to _____ per cell in mesophylls. Pg-136, easy
 A) 20 - 40; 1 - 5
 B) 1 ; 20 - 40
 C) 10 - 20; 20 - 40
 D) 5; 10 - 20
130. Common features of mitochondria & chloroplasts are :- Pg-136, easy
 A) Number of membrane & type of DNA molecules only
 B) Number of membrane; Ribosomes type and DNA molecule type
 C) Types of thylakoid & genetic material.
 D) Types of thylakoid, genetic material and permeability of membrane.
131. What are types of thylakoid inside the chloroplast:- Pg-136, easy
 A) Intergranal thylakoid and stroma lamellae
 B) Granum thylakoid only
 C) Stroma thylakoid only
 D) None of the above
132. Flat membranous tubules connecting the thylakoids in chloroplast is known as:- Pg-136, easy
 A) Granal thylakoid
 B) Grama
 C) Stroma thylakoid / lamellae
 D) All of the above
133. The membrane of chloroplast encloses a space known as:- Pg-136, easy
 A) Matrix
 B) Cytoplasm
 C) Lumen
 D) All of them
134. The stroma of chloroplast contains:- Pg-136, easy
 (i) Enzyme for carbohydrate & proteins synthesis.
 (ii) Small single stranded DNA molecule.
 (iii) Ribosomes of 70's type.
 A) Only one the above
 B) Only two of the above
 C) Only three of the above
 D) None of the above
135. Chlorophyll pigments are present in the:- Pg-136, easy
 A) Matrix
 B) Stroma
 C) Membrane
 D) Thylakoid
136. The ribosomes of chloroplast are:- Pg-136, easy
 A) Same as Eukaryotic cell
 B) 70's type with single subunit
 C) 70's type with two subunits
 D) All of the above

Paragraph - 8.5.6 Ribosomes

137. Which of the following statements are true regarding ribosomes :- Pg-136, easy
 i) Granular structure
 ii) First observed as dense particles by George Palade in 1953
 iii) Composed of m - RNA & proteins.
 iv) Surrounded by a single unit membrane
 A) Two of them
 B) Three of them
 C) All of them
 D) Only one of them
138. What are the types of Ribosomes in a Prokaryotic and Eukaryotic cell. Pg-136, easy
 A) 70s' and 80s'
 B) 80s' and 70s'

- D) Arranged centrally only
150. What is arrangement of microtubules in the cilium and flagellum **Pg-137, easy**
 A) 9 - peripheral & 3 - central B) Two - peripheral & 9 - central
 C) 9 - peripheral & two central D) All peripheral
151. The central sheath is:- **Pg-137, easy**
 A) Connected to inter doublet bridges
 B) Encloses peripheral doublets
 C) Connected to peripheral microtubules
 D) All of the above
152. Which of the following statement regarding cilia and flagella are not correct:- **Pg-137, easy**
 A) Peripheral doublets are inter connected by linker
 B) Linker are also known as inter doublet bridge
 C) Both emerges out from a centriole like structure
 D) Linker are also known as basal body

Paragraph 8.5.9 Centrosome and centrioles

153. Centrosome and centrioles can be found in:- **Pg-137, easy**
 A) Animal cells only B) Plant cells only
 C) Both animal & plant cells D) In plant & Bacterial cells
154. Centrioles in the centrosome are:- **Pg-137, easy**
 A) Parallely arranged to each other
 B) Perpendicularly arranged to each other
 C) Arranged like a cart wheel
 D) Made up of triplets of centrally arranged microtubules
155. The basal body of centriole has micro tubular arrangement of:- **Pg-137, easy**
 A) 9 + 0 B) 9 + 2 C) 9 + 3 D) 3 + 9
156. The central part of the proximal region of the centriole is:- **Pg-137, easy**
 A) Known as radial spoke B) Known as a central hub
 C) Connected to the peripheral doublets D) All of the above
157. The structure that give rise to the spindle fibers during cell division in animal cell is:- **Pg-137, easy**
 A) Cilia B) Flagella C) Both D) Centriole

Paragraph 8.5.10 Nucleus

158. i) Nucleus as an organelle was first described by Robert brown
 ii) Stained by the basic dyes, the material is known as chromatin by Robert brown
 iii) Double membrane bound structure
 How many of the above statement are not true about the nucleus & its material:- **Pg 138, easy**
 A) Only one B) Only two C) Only three D) Only four
159. The nucleus has highly extended and elaborate nucleoprotein fibers known as:- **Pg 138, easy**
 A) Nucleoli B) Chromosome C) Chromatin D) Nuclear matrix
160. The contents of an inter phase nucleus are:- **Pg 137, easy**
 Nucleoli ; chromatin ; nuclear matrix; two membranes
 A) Only two of the above B) Only three of the above
 C) Only four of the above D) Only of the above
161. What forms the barrier between the cytoplasmic content and nuclear matrix:- **Pg 137, easy**

- A) Has primary constriction
 B) Is visible only in dividing cells.
 C) Has disc shaped structure known as kinetochore
 D) All of the above
173. Function of centriole is: **Pg 139, easy**
 A) Provides site of attachment to the spindle fibers on chromosome
 B) Holds two chromatids of a chromosome
 C) Both (A) & (B) D) None
174. What is type of chromosome having a middle centromere:- **Pg 139, easy**
 A) Metacentric B) Sub – metacentric
 C) Acrocentric D) Telocentric
175. What is the type of chromosome having its centromere near the telomere **Pg 139, easy**
 A) Metacentric B) Sub – metacentric
 C) Telocentric D) Acrocentric
176. Chromosomes having centromere slightly away from the middle is:- **Pg 139, easy**
 A) Metacentric B) Sub – metacentric
 C) Telocentric D) Acrocentric
177. Chromosome having one long and one short arm are:- **Pg 139, easy**
 A) Metacentric & sub – metacentric
 B) Sub – metacentric & acrocentric
 C) Acrocentric & telocentric
 D) Telocentric & metacentric
178. A non – staining is present on a few chromosome
 A) Secondary constriction or centromere
 B) Satellite or centromere
 C) Secondary constriction or satellite
 D) None of the above

Paragraph - 8.5.11

Micro bodies

179. Membrane bound minute vesicles containing enzymes are known as:- **Pg 140, easy**
 A) Chloroplast B) Mitochondria C) Ribosomes D) Micro bodies

NEET PREVIOUS YEARS QUESTIONS

1. Which of the following is true for nucleolus? [2018]
(a) Larger nucleoli are present in dividing cells.
(b) It is a membrane-bound structure.
(c) It is a site for active ribosomal RNA synthesis.
(d) It takes part in spindle formation.
2. The Golgi complex participates in: [2018]
(a) Fatty acid breakdown (b) Formation of secretory vesicles
(c) Activation of amino acid (d) Respiration in bacteria
3. Which of the following events does not occur in rough endoplasmic reticulum? [2018]
(a) Protein folding (b) Protein glycosylation
(c) Phospholipid synthesis (d) Cleavage of signal peptide
4. Select the incorrect match. [2018]
(a) Lampbrush - Diplotene bivalents chromosomes
(b) Allosomes - Sex chromosomes
(c) Polytene - Oocytes of amphibians chromosomes
(d) Submetacentric - L-shaped chromosomes chromosomes
5. Which of the following cell organelles is responsible for extracting energy from carbohydrates to form ATP? [2017]
(a) Ribosome (b) Chloroplast (c) Mitochondrion (d) Lysosome
6. Mitochondria and chloroplast are [2016]
1. semi-autonomous organelles.
2. 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) Both 1 and 2 are true (b) 2 is true but 1 is false
(c) 1 is true but 2 is false (d) Both 1 and 2 are false
7. Microtubules are the constituents of : [2016]
(a) Cilia, Flagella and Peroxisomes (b) Spindle fibres, Centrioles and Cilia
(c) Centrioles, Spindle fibres and Chromatin (d) Centrosome, Nucleosome and Centrioles
8. Which one of the following cell organelles is enclosed by a single membrane? [2016]
(a) Mitochondria (b) Chloroplasts (c) Lysosomes (d) Nuclei
9. A protoplast is a cell: [2015]
(a) Without nucleus (b) Undergoing division
(c) Without cell wall (d) Without plasma membrane
10. Which one of the following is not an inclusion body found in prokaryotes? [2015]
(a) Cyanophycean granule (b) Glycogen granule (c) Polysome (d) Phosphate granule
11. Which of the following are not membrane-bound? [2015]
(a) Ribosomes (b) Lysosomes (c) Mesosomes (d) Vacuoles
12. Identify the correct order of organisation of genetic material from largest to smallest. [2015]
(a) Genome, chromosome, nucleotide, gene

- (b) Genome, chromosome, gene, nucleotide
 (c) Chromosome, genome, nucleotide, gene
 (d) Chromosome, gene, genome, nucleotide
13. Balbiani rings are sites of: [2015]
 (a) Nucleotide synthesis (b) Polysaccharide synthesis
 (c) RNA and protein synthesis (d) Lipid synthesis
14. Match the columns and identify the correct option. [2015]
- | Column-I | Column-II |
|---------------|--|
| 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 - IV; C - I; D - II (b) A - III; B - I; C - IV; D - II
 (c) A - III; B - IV; C - II; D - I (d) A - IV; B - III; C - I; D - II
15. Cellular organelles with membranes are [2015]
 (a) chromosomes, ribosomes and endoplasmic reticulum.
 (b) endoplasmic reticulum, ribosomes and nuclei.
 (c) lysosomes, Golgi apparatus and mitochondria.
 (d) nuclei, ribosomes and mitochondria.
16. Satellite DNA is important because it [2015]
 (a) Shows high degree of polymorphism in population and also the same degree of polymorphism in an individual, which is heritable from parents to children.
 (b) Does not code for proteins and is same in all members of the population.
 (c) Codes for enzymes needed for DNA replication.
 (d) Codes for proteins needed in cell cycle.
17. DNA is not present in: [2015]
 (a) Ribosomes (b) Nucleus (c) Mitochondria (d) Chloroplast
18. Nuclear envelope is a derivative of : [2015]
 (a) Membrane of Golgi complex (b) Microtubules
 (c) Rough endoplasmic reticulum (d) Smooth endoplasmic reticulum
19. Select the correct matching in the following pairs. [2015]
 (a) Smooth ER - Synthesis of lipids (b) Rough ER - Synthesis of glycogen
 (c) Rough ER - Oxidation of fatty acids (d) Smooth ER - Oxidation of phospholipid
20. The function of the gap junction is to [2015]
 (a) Facilitate communication between adjoining cells by connecting the cytoplasm for rapid transfer of ions, small molecules and some large molecules.
 (b) Separate two cells from each other.
 (c) Stop substance from leading across a tissue
 (d) Performing cementing to keep neighbouring cells together.
21. Cell wall is absent in: [2015]
 (a) *Funaria* (b) *Mycoplasma* (c) *Nostoc* (d) *Aspergillus*
22. The chromosomes in which centromere is situated close to one end are: [2015]
 (a) Acrocentric (b) Telocentric (c) Sub-metacentric (d) Metacentric

23. Which structures perform the function of mitochondria in bacteria? [2014]
 (a) Nucleoid (b) Ribosomes (c) Cell wall (d) Mesosomes
24. The solid linear cytoskeletal elements having a diameter of 6 nm and made up of a single type of monomer are known as: [2014]
 (a) Microtubules (b) Microfilaments (c) Intermediate filaments (d) Lamins
25. The osmotic expansion of a cell kept in water is chiefly regulated by: [2014]
 (a) Mitochondria (b) Vacuoles (c) Plastids (d) Ribosomes
26. Match the following and select the correct answer. [2014]
- | Column I | Column II |
|------------------------------------|------------------------------------|
| A. Centriole | I. Infoldings in mitochondria |
| B. Chlorophyll | II. Thylakoids |
| C. Cristae | III. Nucleic acids |
| D. Ribozymes | IV. Basal body cilia or flagella |
| (a) A - IV; B - II; C - I; D - III | (b) A - I; B - II; C - IV; D - III |
| (c) A - I; B - III; C - II; D - IV | (d) A - IV; B - III; C - I; D - II |
27. The shorter and longer arms of a submetacentric chromosome are referred to as (NEET-2019)
 (1) s-arm and l-arm respectively (2) p-arm and q-arm respectively
 (3) q-arm and p-arm respectively (4) m-arm and n-arm respectively
28. Which of the following pair of organelles does not contain DNA :- (NEET-2019)
 (1) Mitochondria and Lysosomes (2) Chloroplast and Vacuoles
 (3) Lysosomes and Vacuoles (4) Nuclear envelope and Mitochondria
29. Which of the following statement is not correct? (NEET-2019)
 (1) Lysosomes have numerous hydrolytic enzymes.
 (2) The hydrolytic enzymes of lysosomes are active under acidic pH.
 (3) Lysosomes are membrane bound structures.
 (4) Lysosomes are formed by the process of packaging in the endoplasmic reticulum.
30. The concept of "Omnis cellula-e cellula" regarding cell division was first proposed by: (NEET-2019)
 (1) Rudolf Virchow (2) Theodore Schwann (3) Schleiden (4) Aristotle
31. Which of the following cell organelles is present in the highest number in secretory cells? (NEET-2019 ODISSA)
 (1) Mitochondria (2) Golgi complex (3) Endoplasmic reticulum (4) Lysosomes
32. Non-membranous nucleoplasmic structures in nucleus are the site for active synthesis of (NEET-2019 ODISSA)
 (1) Protein synthesis (2) mRNA (3) rRNA (4) tRNA
33. Which of the following nucleic acids is present in an organism having 70S ribosomes only? (NEET-2019 ODISSA)
 (1) Single stranded DNA with protein coat
 (2) Double stranded circular naked DNA
 (3) Double stranded DNA enclosed in nuclear membrane
 (4) Double stranded circular DNA with histone proteins
34. Match the column-I with column-II :- (NEET-2019 ODISSA)
- | Column-I | Column-II |
|-----------------|------------------|
|-----------------|------------------|

- (a) Golgi apparatus (i) Synthesis of protein
 (b) Lysosomes (ii) Trap waste and excretory products
 (c) Vacuoles (iii) Formation of glycoproteins and glycolipids
 (d) Ribosomes (iv) Digesting biomolecules

Choose the right match from options given below :-

- (1) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i) (2) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)
 (3) (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i) (4) (a)-(i), (b)-(ii), (c)-(iv), (d)-(iii)

35. "Ramachandran plot" is used to confirm the structure of :- **(NEET-2019)**

ODISSA)

- (1) RNA (2) Proteins (3) Triacylglycerides (4) DNA

36. Inclusion bodies of blue- green, purple and green photosynthetic bacteria are **(NEET-2020 COVID-19)**

- (1) Contractile vacuoles (2) Gas vacuoles (3) Centrioles (4) Microtubules

37. The biosynthesis of ribosomal RNA occurs in : **(NEET-2020 COVID-19)**

- (1) Ribosomes (2) Golgi apparatus (3) Microbodies (4) Nucleolus

38. The size of Pleuropneumonia - like Organism (PPLo) is : **(NEET-2020 COVID-19)**

- (1) 0.02 mm (2) 1-2 mm (3) 10-20 mm (4) 0.1 mm

39. Which of the following statements about inclusion bodies is incorrect? **(NEET-2020)**

- 1) These represent reserve material in cytoplasm
- 2) They are not bound by any membrane
- 3) These are involved in ingestion of food particles
- 4) They lie free in the cytoplasm

40. Which is the important site of formation of glycoproteins and glycolipids in eukaryotic cells?

(NEET-2020)

- 1) Polysomes 2) Endoplasmic reticulum
 3) Peroxisomes 4) Golgi bodies

41. When the centromere is situated in the middle of two equal arms of chromosomes, the chromosome is referred as:

[NEET-2021]

- (1) Telocentric (2) Sub-metacentric (3) Acrocentric (4) Metacentric

42. Which of the following is an incorrect statement?

[NEET-2021]

- (1) Microbodies are present both in plant and animal cells.
- (2) The perinuclear space forms a barrier -between- the materials present inside the nucleus and that of the cytoplasm
- (3) Nuclear pores act as passages for proteins and RNA molecules in both directions between nucleus and cytoplasm.
- (4) Mature sieve tube elements possess a conspicuous nucleus and usual cytoplasmic organelles.

43. Match List-I with List-II [NEET-2021]

List-I

List-II

- | | |
|---------------|---|
| a) Cristae | i) Primary constriction in chromosome |
| b) Thylakoids | ii) Disc-shaped sacs in Golgi apparatus |
| c) Centromere | iii) Infoldings in mitochondria |
| d) Cisternae | iv) Flattened membranous sacs in stroma of plastids |
- 1) a-i, b-iv, c-iii, d-ii 2) a-iii, b-iv, c-i, d-ii
3) a-ii, b-iii, c-iv, d-I 4) a-i, b-iii, c-ii, d-i

44. The organelles that are included in the endomembrane system are : [NEET-2021]

1. Endoplasmic reticulum, Golgi complex, Lysosomes and vacuoles
2. Golgi complex, Mitochondria, ribosomes and Lysosomes
3. Golgi complex, Endoplasmic reticulum, Mitochondria and Lysosomes
4. Endoplasmic reticulum, Mitochondria , Ribosomes and Lysosomes

45. Match List - I with List - II [NEET-2022]

List - I

List - II

- | | |
|---------------------------|--|
| a) Metacentric chromosome | i) Centromere situated close to the end forming one extremely short and one very long arms |
| b) Acrocentric chromosome | ii) Centromere at the terminal end |
| c) Sub-metacentric | iii) Centromere in the middle forming two equal arms of chromosomes |
| d) Telocentric chromosome | iv) Centromere slightly away from the middle forming one shorter arm and one longer arm |

Choose the correct answer from the options given below:

- 1) (a) - (iii), (b) - (i), (c)- (iv), (d) - (ii)
- 2) (a) - (i), (b) - (iii), (c)- (ii), (d) - (iv)
- 3) (a) - (ii), (b) - (iii), (c)- (iv), (d) - (i)
- 4) (a) - (i), (b) - (ii), (c)- (iii), (d) - (iv)

46. Which of the following statements with respect to Endoplasmic Reticulum is incorrect? [NEET-2022]

- 1) RER has ribosomes attached to ER
- 2) SER is devoid of ribosomes
- 3) In prokaryotes only RER are present
- 4) SER are the sites for lipid synthesis

47. Given below are two statements :

Statement I :- In bacteria, the mesosomes are formed by the extensions of plasma membrane.

Statement II :- The mesosomes, in bacteria, help in DNA replication and cell wall formation.

In the light of the above statements, choose the most appropriate answer from the options given below:

- (a) Statement I is correct but Statement II is incorrect.
- (b) Statement I is incorrect but Statement II is correct.
- (c) Both Statement I and Statement II are correct.
- (d) Both Statement I and Statement II are incorrect.

[NEET 2023 Manipur]

48. How many different proteins does the ribosome consist of?

- (a) 60 (b) 40
(c) 20 (d) 80

[NEET 2023]

49. Which of the following functions is carried out by cytoskeleton in a cell?

- (a) Protein synthesis (b) Motility
(c) Transportation (d) Nuclear division

[NEET 2023]

50. Match List I with List II

	List-I		List-II
A.	Nucleolus	I.	Site of formation of glycolipid
B.	Centriole	II.	Organization like the cartwheel
C.	Leucoplasts	III.	Site for active ribosomal RNA synthesis
D.	Golgi apparatus	IV.	For storing nutrients

Choose the correct answer from the options given below:

- (a) A-III, B-II, C-IV, D-I
(b) A-II, B-III, C-I, D-IV
(c) A-III, B-IV, C-II, D-I
(d) A-I, B-II, C-III, D-IV

[NEET 2024]

51. The DNA present in chloroplast is:

- (a) Linear, double stranded
(b) Circular, double stranded
(c) Linear, single stranded
(d) Circular, single stranded

[NEET 2024]

52. Match List I with List II :

List I

- A. Axoneme
B. Cartwheel pattern
C. Crista
D. Satellite

List II

- I. Centriole
II. Cilia and flagella

III. Chromosome

IV. Mitochondria

Choose the correct answer from the options given below :

- (a) A-IV, B-III, C-II, D-I
- (b) A-IV, B-II, C-III, D-I
- (c) A-II, B-IV, C-I, D-III
- (d) A-II, B-I, C-IV, D-III

[NEET 2024]

53. Given below are two statements:

Statement I: Mitochondria and chloroplasts both double membranes bound organelles.

Statement II: Inner membrane of mitochondria is relatively less permeable, as compared chloroplast. In the light of the above statements, choose the mis appropriate answer from the options given below:

- (a) Both Statement I and Statement II are correct.
- (b) Both Statement I and Statement II are incorrect.
- (c) Statement I is correct but Statement II is incorrect.
- (d) Statement I is incorrect but Statement II is correct.

[NEET 2024]

54. Which of the following statements are correct with respect of Golgi apparatus?

- (A) It is the important site of formation of glycoprotein and glycolipids.
- (B) It produces cellular energy in the form of ATP.
- (C) It modifies the protein synthesized by ribosomes on ER.
- (D) It facilitates the transport of ions.
- (E) It provides mechanical support.

Choose the most appropriate answer from the options given below:

- (a) (B) and (C) only
- (b) (A) and (C) only
- (c) (A) and (D) only
- (d) (D) and (E) only

[NEET 2023 Manipur]

55. Which of the following are **NOT** considered as the part of endomembrane system?

- A. Mitochondria
- B. Endoplasmic reticulum
- C. Chloroplasts
- D. Golgi complex
- E. Peroxisomes

Choose the most appropriate answer from the options given below:

- (a) A, C and E only
- (b) A and D only
- (c) A, D and E only
- (d) B and D only

[NEET 2023]

56. From the statements given below choose the correct option:

- A. The eukaryotic ribosomes are 80 S and prokaryotic ribosomes are 70S.
- B. Each ribosome has two sub-units.
- C. The two sub-units of 80 S ribosome are 60 S and 40 S while that of 70 S are 50 S and 30 S .
- D. The two sub-units of 80 S ribosome are 60 S and 20 S and that of 70 S are 50 S and 20 S .
- E. The two sub-units of 80 S are 60 S and 30 S and that of 70S are 50S and 30S

- (a) A, B, C are true
- (b) A, B, D are true
- (c) A, B, E are true
- (d) B, D, E are true

[NEET 2025]

57. Match List-I with List-II.

List-I

- A. Centromere
- B. Cilium
- C. Cristae
- D. Cell membrane

List-II

- I. Mitochondrion
- II. Cell division
- III. Cell movement
- IV. Phospholipid Bilayer

Choose the correct answer from the options given below:

- (1) A-I, B-II, C-III, D-IV
- (2) A-II, B-I, C-IV, D-III
- (3) A-IV, B-II, C-III, D-I
- (4) A-II, B-III, C-I, D-IV

[NEET 2025]

58. A specialized membranous structure in a prokaryotic cell which helps in cell wall formation, DNA replication and respiration is:

- (a) Mesosome
- (b) Chromatophores
- (c) Cristae
- (d) Endoplasmic Reticulum

[NEET 2025]

59. Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A): The primary function of the Golgi apparatus is to package the materials made by the endoplasmic reticulum and deliver it to intracellular targets and outside the cell.

Reason (R): Vesicles containing materials made by the endoplasmic reticulum fuse with the cis face of the Golgi apparatus, and they are modified and released from the trans face of the Golgi apparatus. In the light of the above statements, choose the correct answer from the options given below:

- (a) Both **A** and **R** are true and **R** is the correct explanation of **A**
- (b) Both **A** and **R** are true but **R** is not the correct explanation of **A**
- (c) **A** is true but **R** is false
- (d) **A** is false but **R** is true

[NEET 2025]

NCERT LINE BY LINE QUESTIONS – ANSWERS

1) C	2) C	3) D	4) C	5) B	6) A	7) D	8) D	9) A	10) A
11) A	12) C	13) D	14) A	15) C	16) A	17) A	18) C	19) D	20) B
21) D	22) C	23) D	24) B	25) C	26) D	27) B	28) D	29) B	30) C
31) A	32) B	33) A	34) C	35) D	36) D	37) D	38) C	39) C	40) B
41) C	42) D	43) D	44) D	45) D	46) C	47) C	48) C	49) C	50) C
51) A	52) C	53) D	54) C	55) D	56) A	57) C	58) A	59) C	60) A
61) A	62) A	63) A	64) D	65) C	66) A	67) A	68) D	69) B	70) A
71) D	72) D	73) C	74) B	75) B	76) D	77) C	78) C	79) A	80) D
81) A	82) D	83) C	84) C	85) A	86) A	87) A	88) A	89) A	90) A
91) C	92) A	93) C	94) A	95) A	96) B	97) B	98) C	99) D	100) C
101) D	102) C	103) D	104) A	105) C	106) C	107) C	108) C	109) C	110) D
111) D	112) B	113) C	114) D	115) A	116) C	117) D	118) C	119) D	120) C
121) D	122) B	123) D	124) C	125) D	126) C	127) D	128) C	129) B	130) B
131) A	132) C	133) C	134) A	135) D	136) C	137) B	138) A	139) A	140) B
141) D	142) B	143) B	144) C	145) D	146) D	147) A	148) C	149) A	150) C
151) C	152) D	153) C	154) B	155) A	156) B	157) D	158) A	159) C	160) C
161) D	162) B	163) D	164) C	165) B	166) A	167) D	168) C	169) C	170) D
171) B	172) D	173) C	174) A	175) C	176) B	177) C	178) C	179) D	

NEET PREVIOUS YEARS QUESTIONS-ANSWERS

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

NEET PREVIOUS YEARS QUESTIONS-EXPLANATIONS

- (c) The nucleolus (plural nucleoli) is a large, distinct, spheroidal subcompartment of the nucleus of eukaryote cells that is the site of ribosomal RNA (rRNA) synthesis and assembly of ribosomal subunits.
- (b) Golgi complex after processing, packages them in vesicles, and either stores them for later use or sends them out of the cell. It is also the organelle that builds lysosomes (cell digestion machines).
- (c) Phospholipid synthesis does not take place in rough endoplasmic reticulum (RER). Smooth endoplasmic reticulum (SER) is involved in lipid synthesis.
- (c) Polytene chromosomes are found in salivary glands of insects of order Diptera
- (c) The site of aerobic oxidation of carbohydrates in cells to generate ATP are mitochondria.

6. (c) Mitochondria & chloroplast are semi-autonomous cell organelle which are formed by division of pre-existing organelle & contain DNA but they also contain protein synthesizing machinery, thus (1) is true & (2) is false.
7. (b)
8. (c) Double membrane bound organelles are mitochondria, chloroplasts, endoplasmic reticulum, golgi body, and nucleus. Single membrane bound organelles are lysosomes, peroxisomes, and vacuoles. Organelles lacking any membrane are ribosomes, centrioles, nucleolus.
9. (c) Cell wall is absent in a protoplast.
10. (c) Polysomes are found in eukaryotes and are defined as a cluster of ribosomes attached to a mRNA molecule. Polysomes are number of ribosomal complexes situated on mRNA.
11. (a) Ribosomes are not membrane-bound cell organelle.
12. (b) Genome > chromosomes > gene > nucleotide.
13. (c) RNA and protein synthesis occur in Balbiani rings.
14. (a)
15. (c) Lysosomes, golgi apparatus and mitochondria are the cell organelles which have membranes.
16. (a) Satellite DNA displays high degree of polymorphism in population and also the same degree of polymorphism in an individual, which is inherited from parents to children (offsprings).
17. (a) Ribosomes are composed of ribonucleic acid and proteins and are not surrounded by any membrane. These are the site for protein synthesis.
18. (c) In late prophase, nuclear envelope disappears and reappears in late telophase from rough endoplasmic reticulum (RER).
19. (a) Lipid synthesis takes place in smooth endoplasmic reticulum.
20. (a) The function of the gap junction is to facilitate communication between adjoining cells by connecting the cytoplasm for rapid transfer of ions, small molecules and some large molecules.
21. (b) Mycoplasma lacks cell wall.
22. (a) In acrocentric chromosomes, one arm is very short but another is long.
23. (d) In some bacteria (*e.g.*, *Bacillus subtilis*), the plasma membrane form certain invaginations or infoldings called mesosomes in the cytoplasm. The mesosomes have various functions, viz., respiratory, secretory etc.
24. (b) Microtubule, microfilament and intermediate filaments along with ER form cytoskeleton. Microfilaments are nonliving, solid and consist of actin protein. They are 4-6 nm in diameter.
25. (b) The vacuole is bound by a single membrane called tonoplast. It also functions as semipermeable membrane. It segregates vacuolar contents from cytoplasm, allows osmotic entry or exit of water, concentration and storage of nutrients as well as wastes.
26. (a)
39. Phosphate granules, glycogen granules and cyanophycean granules are inclusion bodies. They are freely present in cytoplasm and are not bound by any membrane
- 40: Golgi bodies is useful for formation of glycoproteins and glycolipids
41. When the centromere is situated in the middle of two equal arms of chromosomes, the chromosome is referred as Metacentric. When the centromere is present slightly away from the middle, it is called sub-metacentric chromosome. When the centromere is present very close to one end of the chromosome, it is called acrocentric chromosome. When the centromere is present at terminal position, the chromosome is called telocentric
42. A mature sieve tube elements possess a peripheral cytoplasm and a large central vacuole but lacks a nucleus. Rest of other statements are correct.

43. iii---iv---i—ii
44. Endo membrane system
Endoplasmic reticulum
Golgi complex , Lysosomes and vacuoles
45. (a) – (iii), (b) – (i), (c)- (iv), (d) – (ii)
46. In prokaryotes membrane bound organelles are absent

47.Ans.(c)

Explanation

The correct answer is :

Option C : Both Statement I and Statement II are correct.

Here's why :

Statement I : In bacteria, the mesosomes are indeed formed by the extensions of the plasma membrane into the cytoplasm. They are typically observed as invaginations of the plasma membrane.

Statement II : Mesosomes in bacteria are thought to assist in several cellular processes including DNA replication, distribution of DNA during cell division, respiration, and cell wall formation. Hence, this statement is also correct.

48.Ans.(d)

Explanation

The ribosome consists of structural RNAs and about 80 different proteins.

49.Ans.(b)

Explanation

An elaborate network of filamentous proteinaceous structures consisting of microtubules, microfilaments and intermediate filaments present in cytoplasm is collectively referred to as the cytoskeleton. It is involved in many functions such as mechanical support, motility, maintenance of the shape of the cell.

50.Ans.(a)

Explanation

- Nucleolus is a site for active ribosomal RNA synthesis

- Both the centrioles in a centrosome lie perpendicular to each other in which each has an organisation like the cartwheel.
- Leucoplasts are the colourless plastids of varied shapes and sizes with stored nutrients.
- Golgi apparatus is the important site for formation of glycoproteins and glycolipids.

51.Ans.(b)

Explanation

- Sol. The DNA present in chloroplast is circular double stranded

52.Ans.(d)

Explanation

- Axoneme is seen in cilia and flagella

- Centriole shows cartwheel appearance
- Crista is found in mitochondria
- Satellite is present in chromosomes

53.Ans. (c)

Explanation

Both mitochondria and chloroplasts are double membrane bound cell organelles. Transport of ions occurs across the inner membrane of mitochondria. The inner membrane of chloroplast is impermeable to ions and metabolites. Therefore, it is said that inner membrane of mitochondria is relatively more permeable to that of chloroplast.

54. Ans.(b)

Explanation

The Golgi apparatus, sometimes called the Golgi body or Golgi complex, plays a critical role in the processing and packaging of proteins and lipids following their synthesis in the endoplasmic reticulum. It also has a role in the formation of glycoproteins and glycolipids.

So, among the given statements :

(A) It is the important site of formation of glycoprotein and glycolipids - This statement is correct.

(B) It produces cellular energy in the form of ATP - This statement is incorrect. The mitochondria, not the Golgi apparatus, are responsible for the production of ATP.

(C) It modifies the protein synthesized by ribosomes on ER - This statement is correct. The Golgi apparatus modifies and packages proteins received from the ER.

(D) It facilitates the transport of ions - This statement is not generally correct. Ion transport is primarily facilitated by the plasma membrane and ion channels.

(E) It provides mechanical support - This statement is incorrect. While the Golgi apparatus does help maintain cellular structure to a degree, its main role is in processing and packaging substances, not providing mechanical support.

So the most appropriate answer from the options given would be Option B :

(A) and (C) only.

55. Ans.(a)

Explanation

The endomembrane system in a cell includes:

- The nuclear envelope
- The endoplasmic reticulum (ER)
- The Golgi apparatus (Golgi complex)
- Lysosomes
- Vesicles
- The plasma membrane

This system is involved in the modification, packaging, and transport of proteins and lipids.

Mitochondria and chloroplasts are not part of the endomembrane system. They are both organelles with their own separate membranes, and they have their own DNA. They are thought to have originated from a symbiotic relationship with prokaryotic cells, a theory known as endosymbiosis.

Peroxisomes, although they are membrane-bound organelles involved in many metabolic reactions, are also not considered part of the endomembrane system because they do not communicate with the other endomembrane organelles and are not involved in protein sorting or lipid synthesis like the other components of the endomembrane system.

Therefore, the answer is :

Option A : A, C, and E only.

56. Ans.(a)

Explanation

- A. True - Eukaryotic ribosomes are 80S, and prokaryotic ribosomes are 70S.
- B. True - Each ribosome consists of two subunits.
- C. True - 80 S ribosome = 60 S + 40 S, and 70S ribosome = **50S + 30S**.
- D. X Incorrect - 20 S is not a known subunit of ribosomes.
- E. X Incorrect - 80 S subunits are 60S and 40S, not 60 S and 30 S .

57. Ans.(d)

Explanation

A.	Centromere	II.	Cell division (site where spindle fibres attach during mitosis)
B.	Cilium	III.	Cell movement (helps in locomotion or movement of substances)
C.	Cristae	I.	Mitochondrion (infoldings of the inner mitochondrial membrane)

D.	Cell membrane	IV.	Phospholipid bilayer (basic structure of the plasma membrane)
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58. Ans.(a)

Explanation

Mesosomes are specialized infoldings of the plasma membrane in prokaryotic cells. They assist in:

- Cell wall formation
- DNA replication
- Respiration

59. Ans.(a)

Explanation

- **Assertion (A):** True - The Golgi apparatus functions to package and sort materials from the ER and delivers them to various destinations.
- **Reason (R):** True - Vesicles from the endoplasmic reticulum fuse with the cis face of the Golgi, and after processing, materials are released from the trans face.

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