Exercise-1

✍ **Marked Questions are for Revision Questions.**

ONLY ONE OPTION CORRECT TYPE

SECTION - A # Introduction, Procaryotic Cell

1. Names of Schleiden and Schwann are associated with

(1) Theory of cell lineage (2) Nucleus function as controling centre of cell

(3) Theory of natural selection (4) Cell theory

2. All cell are derived from pre-existing cells" is the famous generalization of

(1) Schultz (2) Schleiden (3) Lamarck (4) Virchow

3.✍ Small cell are metabolically active as they have

(1) Higher surface area to volume ratio (2) higher nucleocytoplasmic ratio

(3) Lower nucleocytoplasmic ratio (4) both (1) & (2)

4. Which of the following features are related with mesokarotic cell?

(1) Nucleus is present (2) Present in dinoflagellates

(3) Histone protein is absent (4) All of the above

5. Read the following statements and choose the correct option.

(i) The physio-chemical approach to study and understand living organisms is called "Reductionist Biology".

(ii) Cell theory which is proposed by Schleiden and Schwann explains how new cells arise.

(iii) Centriole is a single membranous cell organelle helps in cell division in animal cell.

(iv) Prokaryotes lack membrane bounded cell organelles.

Select the correct statements.

(1) (i) & (ii) (2) (ii) & (iii) (3) (ii) & (iv) (4) (i) & (iv)

6. Select the pair of correct statements with respect to prokaryotic cell.

(i) The genomic DNA is circular and naked

(ii) Large linear DNA outside the genomic DNA is known as plasmid

(iii) Plasmid DNA confers certain unique phenotypic character to bacteria.

(iv) Prokaryotic cells are devoid of cell organelles.

(1) i , ii, iii, iv (2) ii & iii (3) ii & iv (4) i & iii

7. Read the following statements & check out the option with incorrect statements with respect to prokaryotes.

(i) Prokaryotic cell's envelop consists of a tightly bounded three layered structures with outer to inner arrangement as cell membrane, glycocalyx & cellwall.

(ii) Mesosomes and chromatophores are the cell membranes extensions

(iii) Fimbriae are small bristle like fibres helpful in attachment with a substratum.

(iv) Thin filamentous extension from the cellwall of bacteria are called flagella.

(1) only (i) (2) (i) & (ii) (3) (i) & (iv) (4) only (ii)

8. Polysome is

(1) r - RNA + Ribosome (2) m - RNA + Ribosome

(3) t - RNA + Lysosome (4) m - RNA + Lysosome

SECTION - B # Cell Wall

1. Cell division is not present in the cells of

(1) Skin (2) Gonads (3) Brain (4) Bone marrow

2. Which is the thickest wall layer?

(1) Middle lamella (2) Tertiary wall (3) Primary wall (4) Secondary wall

3. Torus is found in

(1) Desmosome (2) Simple pit (3) Bordered pit (4) Plasmodesmata

4. Cell wall was first studied by

(1) Bonner (2) Strasburger (3) Robert Hooke (4) Flemming

5. The intercellular structure separating the walls of two adjacent cells is

(1) Primary wall (2) Middle lamella (3) Plasma membrane (4) Secondary wall

6. Rigidity in the cell wall is due to

(1) Cellulose (2) Suberin (3) Lignin (4) Pectin

7. The phragmoplasts are precursors of

(1) Cell plate (2) Chloroplast (3) Chromoplast (4) Leucoplasts

SECTION - C # Cell membrane

1. The plasma membrane of human RBC consist of

(1) 60% lipid and 40% protein (2) 59% protein and 39% lipids

(3) 52% protein and 40% lipids (4) 42% protein, 58% lipids and carbohydrates

2. According to Singer and Nicolson which of the following are present in plasma membrane?

(1) Chitin and phospholipid (2) Phospholipid, extrinsic and intrinsic protein

(3) Carbohydrates and protein (4) Hemi cellulose and cellulose

3. Plasma membrane is asymmetric because

(1) Lipids present in the outer and inner side of the bilayer are different

(2) Extrinsic proteins are more abundant on the inner surface than on the outer surface

(3) Oligosaccharides are attached only to the external surface of lipids and proteins of a biomembrane

(4) All of the above

4. Fluid mosaic model of cell membrane proposes that

(1) A lipid bilayer with embedded proteins only

(2) A lipid bilayer with proteins on the outer surface only

(3) A lipid bilayer coated with proteins on both the surfaces

(4) A lipid bilayer with proteins of two types, embedded (intrinsic) and superficial (extrinsic)

5. Plasma membrane particularly in animal cell is elastic due to

(1) Lipids (2) Proteins (3) Carbohydrates (4) None of these

6. Cell recognition and adhesion occurs due to the following component of the plasma membrane
(1) Protein (2) Lipids
(3) Proteins and lipids (4) Glycoproteins & glycolipids

SECTION - D # PLASTIDS

1. Which of the plastid stores protein?
(1) Elaioplast (2) Chloroplast (3) Amyloplast (4) Aleuroplast

2. The pigment which is not found in chloroplast is-
(1) Carotene (2) Chlorophyll (3) Xanthophyll (4) Anthocyanin

3. The endosymbiotic theory explains
(1) The origin of the nucleus
(2) The origin of mitochondria and chloroplasts
(3) Why prokaryotic cells are different from eukaryotic cells
(4) Where the endomembrane system came

4. Chloroplasts are called semi-autonomous structures due to presence of-
(1) RNA only (2) DNA only
(3) Both RNA and DNA (4) Pigment and proteins

5. Fret channels are characteristics of
(1) Mitochondria (2) Dictyosomes (3) ER (4) Chloroplast

6. The complex liquid matrix of chloroplast is called
(1) Cytoplasm (2) Cytosol (3) Hyaloplasm (4) Stroma

7. Larger thylakoids in chloroplast are called
(1) Grana lamellae (2) Stroma lamellae (3) Grana (4) Loculus

SECTION - E # MITOCHONDRIA

1. Mitochondria are the site of
(1) ATP formation (2) Cellular respiration (3) Electron transport (4) All of these

2. Which of the following structure is present in mitochondria?
(1) Oxysome (2) Polysome (3) Dictyosome (4) Quantasome

3. Oxidative phosphorylation takes place in
(1) Chloroplasts (2) Vacuoles (3) Mitochondria (4) Ribosome

4. Cytochrome oxidases are found
(1) On outer wall of mitochondria (2) In the matrix of mitochondria
(3) In the lysosomes (4) On cristae of mitochondria

5. In living cells mitochondria can be stained with
(1) Neutral red (2) Janus green B (3) Crystal violet (4) Aceto-orcein

6. Mtiochondria are not found in
(1) Liver cells (2) Yeast (3) Mature RBCs (4) Immature RBCs

7. Mitochondria and chloroplast contain
(1) DNA (2) DNA + RNA
(3) DNA + RNA + ribosomes (4) Proteins

8. Synthesis of ATP in mitochondria takes place
(1) In the matrix (2) In the intracristal space
(3) At the cristae (4) At the outer membrane

9. The mitochondrial DNA differs from the nuclear DNA in
(1) Lacking association with histone (2) Being circular in nature
(3) Having higher C–G ratio (4) All of these

10. The inner membrane of mitochondria bears foldings called cristae these cristae
(1) Increase ATP supply (2) Keep external substances away
(3) Increase the thickness of wall (4) Increase surface area

11. Enzyme ATPase is found in head of oxysome that is called
(1) F_0 (2) F_1–F_0 (3) F_1 (4) None of these

12. Which of the following observations most strongly support the view that the mitochondria have electron transport system?
(1) Mitochondria have a folded inner membrane
(2) Mitochondria have a property to concentrate in cells, which form locomotory structures.
(3) Disruption of mitochondria yields membrane fragments, which are able to synthesize ATP.
(4) A protein capable of utilizing ATP is obtsained from mitochondria.

13. If a cell is placed under anaerobic condition
(1) ER will disappear (2) Mitochondria will multiply
(3) Mitochondria will disappear (4) Mitochondria and ribosomes will multiply speedly.

14. Outer and inner membrane of motochondria are–
(1) Structurally similar but functionally different (2) Functionally similar but structurally different.
(3) Structurally and functionally similar (4) Structurally and functionally dissimilar

15. Inner membrane of mitochondria contains
(1) Cytochrome oxidase (2) Succinic dehydrogenase
(3) Malic dehydrogenase (4) Both (1) and (2)

SECTION - F # Endoplasmic Reticulum (ER)

1. Endoplasmic reticulum often bears
(1) Centrioles (2) Lysosomes (3) Ribosomes (4) Plastids

2. Microsomes are related to
(1) Endoplasmic reticulum (2) Spherosomes
(3) Lysosomes (4) Plasmalemma

3. Plasmodesmata often has ER (endoplasmic reticulum) tubule called as
(1) Symplasm (2) Desmotubule (3) Apoplasm (4) Intermediate filaments

4. Which of the following is associated with detoxification of drugs and muscle contraction by the release and uptake of Ca^{2}+ ions?
(1) Golgi complex (2) RER (3) SER (4) Free ribosomes

5. The site of detoxification reaction in liver is
(1) SER (2) Free ribosomes (3) RER (4) hydrophobic interaction

6. ER is involved in all of the following except
(1) Production of ribosomes
(2) Synthesis of lipids
(3) Synthesis of proteins
(4) Transportation of molecules to the cell membrane for export.

7. Which organelle help in the synthesis of lipids, cholesterol, steroids and visual pigments in epithelial cells of retina?
(1) RER (2) SER (3) Golgi bodies (4) All of these

8. Myeloid bodies, sarcoplasm of muscles and nissl granules are rich in
(1) Fats (2) Golgi bodies (3) Lipids (4) ER

9. The close functional relationship between ER, Golgi, Lysosome are represent as
(1) GERL system (2) Vacuolar system (3) Annulated lamellae (4) None of the above

10. ER of rapidly dividing cells is
(1) Non functional (2) Highly developed (3) Less developed (4) Absent

SECTION - G # Golgi Complex

1. Cell organelles associated with secretion are
(1) Mitochondria (2) Ribosomes (3) Chloroplasts (4) Golgi complex

2. Besides giving out secretory vesicles, Golgi apparatus is also concerned with formation of
(1) Grana of chloroplasts (2) Plastids
(3) Enzymes of mitochondria (4) Lysosomes

3. The Golgi complex is specialized for
(1) Glycosylation of lipids and proteins (2) Conversion of light energy into chemical energy
(3) Generation of ATP (4) Intracellular digestion

4. If the cells are broken up and sedimented by centrifugation the new structure formed in one of the fraction is
(1) Lysosomes (2) Microsome (3) Ribosome (4) Centrosomes

5. The organelle that moves materials out of the cell is
(1) ER (2) Lysosomes (3) Golgi bodies (4) Ribosomes bound on ER

6. In plant cells the number of golgi bodies increases during
(1) Respiration (2) Cell division (3) Translocation (4) Food synthesis

7. Which organelle is located near the nucleus and contains stack of flattened cisternae structures?
(1) Centrosome (2) Chloroplast (3) Golgi bodies (4) Centriole

8. Golgi bodies are maximum in
(1) Root cap cells (2) Root tip cells (3) Calyprogen (4) Quiesent centre

9. Secretory vesicles are pinched off as zymogen granules from _____ side of dictyosomes
(1) Plain (2) Convex (3) Concave (4) All sides

SECTION - H # Lysosome

1. Lysosomes are celled "suicide bags" because they have
(1) Catabolic enzymes (2) Food vacuole (3) Hydrolytic enzymes (4) Parasitic activity.

2. Autophagic vacuoles digest
(1) Cell organelles (2) Solid particles of phagosomes
(3) Fluid droplets of pinosomes (4) None of the above

3. Which of the following organelle show polymorphism?
(1) Golgi apparatus (2) Lysosome (3) Mitochondria (4) Chloroplast

4. The mitochondria serves as a marker for cytochrome oxidase and the Lysosomes serve for...
(1) Succinic dehydrogenase (2) Catalse
(3) Galactosidase (4) Acid phosphatase

5. Most of hydrolytic enzymes of lysosomes function at
(1) Basic pH (2) Any pH (3) Neutral pH (4) Acidic pH

6. Pri. lysosome + phagosome forms
(1) Residual body (2) Secondary lysosome
(3) Autophagic vacuole (4) None of these

SECTION - I # Ribosome

1. Engine of the cell is
(1) Ribosome (2) Lysosome (3) Vacuole (4) Mitochondria

2. Ribosomes are attached to endoplasmic reticulum through
(1) r-RNA (2) Hydrophobic interaction
(3) t-RNA (4) Ribophorins

3. The smallest organelles in the cell are
(1) Dictyosomes (2) Lysosomes (3) Microsomes (4) Ribosomes

4. Protein synthesis in an animal cell occurs
(1) Only on the ribosomes present in the cytosol
(2) Only on ribosomes attached to the nuclear envelope and ER
(3) On ribosomes present in the cytoplasm as well as in mitochondria
(4) On ribosomes present in the nucleolus as wall as in cytoplasm

5. Site of formation of ribosomal precursor in eucaryotic cell is
(1) Stroma (2) Nucleus (3) Nucleolus (4) Golgi body

6. Specific cells which secretes protein contain large number of
(1) ER (2) Free ribosomes (3) Bound ribosomes (4) Golgi bodies

7. In ribosomes two subunits are
(1) Joins only at the time of protein synthesis (2) Lie freely in cytoplasm
(3) Dissociates at the end of protein synthesis (4) All of the above

8. Sedimentation coefficient is represented by S. Greater the size of ribosome unit
(1) Greater will be the value of S (2) Smaller will be the value of S
(3) Value of S will be same (4) It has no relation with the size

9. 70 S type of ribosomes are found in
(1) Eukaryotic cells (2) Mitochondria (3) Prokaryotic cells (4) All of these

SECTION - J # Cilia & Flagella, Centrioles and cytoskeletal elements

1. Basal bodies are associated with the development of
(1) Cilia and flagella (2) Cell plate (3) Phragmoplast (4) Kinetochore

2. Cilia and flagella have
(1) Dissimilar internal structure and are of similar size
(2) Dissmilar internal structure and are of unequal size
(3) Similar internal structure and are of dissimilar size
(4) Similar internal structure and are of equal size

3. 9+0 microtubular structure is found in-
(1) Centriole (2) Basal body (3) Blepharoplast (4) All of these

4. Pick up the incorrect pair-

(I) Movement of cilia	-	sweeping or pendular stroke
(II) Giant lysosome	-	sperm acrosome
(III) Movement of flagella	-	independent to each other
(IV) Giant centriole	-	Oocytes and sperms
(V) Basal body (kinetosome)	-	9 + 0 fibrillar arrangement
(VI) Number of flagella for cell	-	Many

(1) Only I is incorrect (2) Only IV is incorrect
(3) IV and VI are incorrect (4) all are incorrect

5. Centrosome is
(1) Cytoplasmic structure of animal cells
(2) A nuclear structure of animal cells
(3) Cytoplasmic structure of plant cells
(4) Cytoplasmic structure of animal cells and some lower plants

6. Basal body could be another name of centriole in view of internal structure when
(1) It gives rise to spindle (2) It divides during mitosis
(3) It gives basic reactions (4) It gives rise to cilia and flagella

7. Centriole and centrosome are found in the cell of
(1) Animals (2) Green plants (3) Bacteria (4) Cyanobacteria.

SECTION - K # MICROBODIES AND VACUOLES

1. Match list-1 with list-2 and select the correct answer

List-I	**List-II**
A Nucleolus	(i) Lipid storage
B Sphaerosomes	(ii) Glycolate metabolism
C Peroxisomes	(iii) Transport of macromolecules
D Plasmodesmata	(iv) RNA synthesis

Codes -	**A**	**B**	**C**	**D**
(1)	(iv)	(i)	(iii)	(ii)
(2)	(i)	(ii)	(iv)	(iii)
(3)	(iv)	(i)	(ii)	(iii)
(4)	(i)	(ii)	(iii)	(iv)

2. Which of the following organelle possess oxidases and are associated with oxidation reaction other than those of respiration?

(1) Sphaerosomes (2) Peroxisomes (3) Lysosomes (4) Golgi

3. Which of the following organelle takes part in photorespiration?

(1) Glyoxisome (2) Peroxisome (3) Dictyosome (4) ER

4. Catalase forms peroxisome protein and utilizes H_2O_2 to oxidise alcohol in liver and converts H_2O_2 into H_2O so it is also called as safty valve. It's opposite enzyme in peroxisome is -

(1) Cyt P–450 (2) Cathepsin (3) Cyt b_5 (4) Oxidase

5. Plant lysosomes rich in fats and taking part in β-oxidation of fattyacids are

(1) Lysosomes (2) Microsomes (3) Sphaerosomes (4) Glyoxysomes

6. Some cellular structures are bounded by single or double membranes while some others are without membrane. Match the organelle in List I with the nature of membranes in List II and select the correct answer-

List-I	**List-II**
(A) Transosomes	(i) Without membrane
(B) Lysosomes	(ii) Single membrane
(C) Ribosomes	(iii) Triple membrane
(D) Nucleus	(iv) Double porous membrane

	A	**B**	**C**	**D**
(1)	(i)	(ii)	(iii)	(iv)
(2)	(iii)	(i)	(ii)	(i)
(3)	(iii)	(ii)	(i)	(iv)
(4)	(ii)	(iii)	(i)	(iii)

7. Vacuole is surrounded by a single membrane called

(1) Plasmalemma (2) Vacuole wall (3) Tonoplast (4) Tono membranous

8. In a plant cell vacuole contains

(1) Water (2) Dissolved salts (3) Gases (4) All of these

9. Cell sap is
(1) Non living part of cytoplasm (2) Living part of cytoplasm
(3) Living matter of cell (4) Non living part of vacuole

10. Vacuolar cell sap has pH
(1) Alkaline and hypotonic (2) Neutral and isotonic
(3) Acidic and hypertonic (4) Equal to cytoplasm and isotonic

11. Vacuoles help in
(1) Making cell light (2) Storing wastes and food particles
(3) Separating water from cytoplasm (4) All of the above

SECTION - L # NUCLEUS

1. Nuclear material without nuclear membrane is found in
(1) Mycoplasma and green algae (2) Bacteria and green algae
(3) Bacteria and cyanobacteria (4) Cyanobacteria and red algae

2. Genome is
(1) Diploid set of chromosomes (2) Haploid set of chromosomes
(3) A single chromosome (4) None of the above

3. A constriction on the chromosomes is called
(1) Centromere (2) Centrosome (3) Centriole (4) Chromomeres

4. Nucleolus takes part in the synthesis of
(1) rRNA (2) tRNA (3) mRNA (4) None of these

5. Number of chromosomes in definite nucleus is/are
(1) Triploid (2) Diploid (3) Polyploid (4) Haploid

6. The genetic material of the bacterial cell is localised within a discrete region, called as
(1) Nucleus (2) Nucleolus (3) Plasmid (4) Nucleoid

7. In bacterial cell DNA is extensively looped and coiled with help of
(1) Acid proteins (2) Histones
(3) Basic nucleoid protein called as polyamines (4) Actin

8. Nucleolus is produced from
(1) 1st constriction
(2) Nucleolar organising region of certain chromosomes
(3) Nuclear envelope
(4) ER

SECTION - M # CELL DIVISION

1 The plane of cell wall formation and spindle formation is determined by
(1) Microtubules (2) Microfilaments
(3) Vesicles of Golgi bodies (4) ER

2. Anastral mitosis is found in
(1) Plants (2) Animals (3) All living cells (4) Prokaryotes

3. The best stage to view structure, size and to count the number of chromosomes is
(1) Metaphase (2) Late prophase (3) Early anaphase (4) I-phase

4. Which is called direct cell division?
(1) Mitosis (2) Amitosis (3) Meiosis (4) All cell divisions

5. During synapsis, the number of chromonemata / DNA in bivalent chromosome are
(1) 2 (2) 4 (3) 8 (4) 16

6. In meiosis, chromosomes separate at
(1) Anaphase-I (2) Anaphase-II (3) Diakinesis (4) Diplotene

7. In plant cells, division of cytoplasm occurs by
(1) Cell plate (2) Cleavage (3) Furrowing (4) Invagination

8. What are events over in telophase
(1) Chromosomes cluster at opposite spindle poles
(2) Nuclear envelope reforms
(3) Nucleolus, Golgi complex, ER reform
(4) All

9. Which among the following is most active and of longest duration in animals?
(1) Diplotene (2) Leptotene (3) Zygotene (4) Pachytene

10. In which stage of cell division the nucleus looks like a ball of wool (spireme stage)?
(1) Prophase (2) Anaphase (3) Prophase-I (4) Cytokinesis

11. The common mitogen is
(1) Temperature (2) Cytokinin (3) Both (1) and (2) (4) Colchicine

12. In which phase of I-Phase, damaged DNA is repaired.
(1) G_1 (2) G_2 (3) S Phase (4) M Phase

13. The centriole divides at
(1) G_1 Phase (2) S phase (3) Anaphase (4) G_2 Phase

14. The gap between 2 successive divisions is called
(1) Interkinesis (2) Interphase (3) I-phase (4) Generation time

15. The active phase, also called metabolic or energetic phase with most cytogenetic activity is
(1) Interphase (2) M–Phase (3) Meiosis (4) Pachytene

16. To observe chiasmata, the most appropriate stage of meiosis would be
(1) Metaphase-II (2) Diakinesis (3) Diplotene (4) Pachytene

17. The number of chromatids in a chromosome at metaphase is
(1) Two in mitosis and one in meiosis (2) One in mitosis and two in meiosis
(3) Two in mitosis and two in meiosis (4) Two in mitosis and four in meiosis.

18. Inhibitors of cell division are
(1) Cyanides and azides (2) Colchicine
(3) Chalones and UV–rays (4) All of the above.

19. Select the correct pair–

Phase of meiosis	**Events that occurs**
1. Prophase I	Crossing over occurs
2. Metaphase I	Sister chromatids migrate to opposite poles
3. Anaphase I	Homologous chromosomes arrange in linear sequence.

(1) 1, 2 and 3 are correct (2) 1 is correct, 2 and 3 are false
(3) 1 and 3 are correct, 2 is false (4) 1 and 2 are correct, 3 is false

20. In pachytene–
(1) Chromatids are not visible (2) Chromomeres are not visible
(3) Chromosomes stain faintly (4) Chromosomes coil more

21. At which stage of cell cycle, cell has undergone differentiation.
(1) G_3 (2) G_1 (3) G_4 (4) G_0

22. Which substage of I phase is of shortest duration?
(1) G_1 (2) G_2 (3) S (4) All of these

23. G_1 is also called as
(1) Pre synthetic phase (2) Post mitotic phase (3) First Gap period (4) All are correct

24. How many mitotic divisions occur in a cell of shoot tip to form 256 cells?
(1) 8 (2) 128 (3) 255 (4) None of these

25. Centriole is in cell division in animal cell required for
(1) Spindle formation (2) Nucleolus reappearance
(3) Chromosome segregation (4) None of the above

26. Mechanism of genetic continuity in mitosis is due to
(1) Crossing over
(2) Pairing
(3) Segregation of maternal and paternal chromosomes
(4) Duplication of DNA

27. What is the cause of cell division?
(1) Decrease in surface area/volume ratio due to growth of cell
(2) Nucleo-cytoplasmic ratio decreases due to increase in size of cell
(3) Disturbance in DNA and RNA ratio
(4) All of the above

28. Colchicine inhibits cell division bring polyploidy
(1) Inhibiting splitting of centromere at anaphase
(2) Inhibiting spindle formation at premetaphase
(3) Splitting chromosomes
(4) Not allowing disappearance of nuclear membrane

29. Mitosis occurs in

(1) Red bone marrow (2) Meristems

(3) Stratum germinativum (4) All of the above

30. The spindle microtubules are polar, their orientation is

(1) '+' and '–' both ends towards the equators

(2) '+' end towards the poles

(3) '+' and '–' both ends towards the poles

(4) '–' end towards the pole

31. An organism has 20 pairs of chromosomes. How many chromosomes will be at the end of meiosis I and in daughter cells at the end of meiosis II?

(1) 10, 20 (2) 20, 20 (3) 10, 5 (4) 10, 10

32. A bacterium that divides once in half hour how many bacteria are formed after 24 hrs. of growth?

(1) 2^{12} (2) 2^{24} (3) 2^{48} (4) 2^{47}

33. In meiosis four daughtor cells are formed that are differ from each other due to

(1) Crossing over (2) Difference in chromosome number

(3) Crossing over and independent assortment (4) Independent assortment only

34. How many successive generations of mitosis must occur to produce 256 cells?

(1) 7 (2) 8 (3) 128 (4) 255

MISCELLANEOUS QUESTIONS

1. Endomenbranous system is formed by

(1) ER + Golgibody + Lysosome + Vacuole (2) ER + Ribosome + Lysosome + Vacuole

(3) ER + Ribosome + Mitochondria + Plastid (4) ER + GB + Ribosome + Lysosome

2. The cell organelle responsible to make luminal and extra-luminal compartment in eukaryotic cell is -

(1) ER (2) GB (3) Nucleus (4) Vacuole

3. Arrangement of golgi apparatus in a cell is

(1) Convex Cis/forming face is towards cell membrane

(2) Concave Cis/forming face is towards cell membrane

(3) Convex Cis/forming face is towards Nucleus while concave trans or maturing face is towards plasma membrance.

(4) Convex Cis/forming face is towards Plasma membrane while concave trans or maturing face is towards Nucleus.

4. Match the columns

Column-I	**Column-II**
(i) Fat	(a) Amyloplast
(ii) Xanthophyll	(b) Aleuroplast
(iii) Protein	(c) Elaioplast
(iv) Starch	(d) Chromoplast

(1) i – b ii – d iii – a iv – c (2) i – c ii – d iii – b iv – a

(3) i – b ii – d iii – c iv – a (4) i – c ii – b iii – d iv – a

5. Checkout the incorrect statement

(1) Nuclear pores are the passages through which movement of RNA and protein molecules take place in both the directions between the nucleus and cytoplasm.

(2) Nucleus contains only one nucleolus exclusively

(3) Chromosome contains DNA, RNA, histones and some non-histone proteins.

(4) A single human cell has approximately 2m long thread of DNA distributed among 46 chromosomes.

6. Select one which is not true for ribosome

(1) Made of two subunits (2) Form polysome

(3) May attach to mRNA (4) Have no role in protein synthesis

7. Which of the following is not a function of cytoskeleton in cell?

(1) Intra cellular transport (2) Maintenance of cell shape & structure.

(3) Support to the organelles (4) Cell motility

8. Axoneme is present in

(1) Centriole (2) Nucleolus (3) Flagella (4) Mitochondria

9. Read the following statement and select the correct option that bears true statements

(i) After S-phase DNA number become twice but chromosomes remain same i.e. 2n.

(ii) A cell in G_0 phase in metabolically active and can enter in division phase depending on the requirement of organism.

(iii) Cell division is a progressive process that shows the distinct boundries between various stages.

(iv) At the end of prophase GB, ER, Nucleolus and nuclear envelope get disappear

(1) i, ii & iv (2) i, ii & iii (3) ii, iii & iv (4) all of these

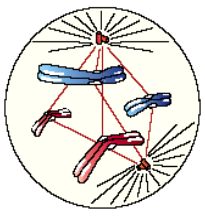
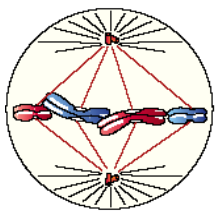
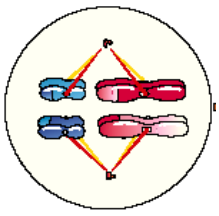
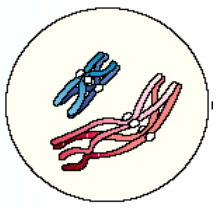
10. Match the columns

Column-I	**Column-II**
(i) Zygotene	(a) X-shape chiasmata
(ii) Pachytene	(b) Formation of bivalent/ tetrad
(iii) Diplotene	(c) Terminalization
(iv) Diakinesis	(d) Recombination

(1) i – d ii –a (iii) –b iv – c (2) i – a ii – d iii – b iv – c

(3) i – b ii – d iii – a iv – c (4) i – a ii – b iii – d iv – c

11. Identify the metaphase-I from the following figures

(1)  (2)  (3)  (4) 

12. Karyokinesis is not followed by cytokinesis in the case of

(1) Zoospore (2) RBCs

(3) Endosperm of coconut (4) Muscles fibre

13. Resistance to antibiotic is character of –
(1) All bacteria (2) All eukaryotes
(3) All bacteria having plasmid (4) Some bacteria having plasmid

14. Which of following do not help in motility–
(1) Flagella (2) Pili (3) Fimbriae (4) Both (2) and (3)

15. Fluid nature of plasma membrane does not help in –
(1) Selective permeability (2) Cell growth and division
(3) Formation of inter cellular junction (4) All

16. ER, Golgi body, lysosome and vacuoles are part of endomembrane system but mitochondria, chloroplast, are not included because –
(1) Endomembrane system include only single membrane bounded cell organelles.
(2) In endomembrane system, organelles do not contain extra nuclear genetic material.
(3) Endomembrane system organelles function in coordinated way
(4) All

17. Proteins synthesis by RER occur in
(1) Luminal intracellular space (2) Extra luminal intracellular space.
(3) Mitochondrial matrix (4) All

18. Which is incorrect regarding vacuole–
(1) Stone water, sap, excretory products.
(2) Plant cell contain large vacuoles (up to 90% cell volume)
(3) Transport of ions in vacuole is mediated against concentration gradient
(4) Food vacuoles are formed by engulfing food particles in higher plants

19. Which among the following are not directly connected with cilia–
(1) Central microtubules (2) Central sheath and peripheral doublet
(3) Pheripheral doublets microtubules (4) None of these

20. Which of following is incorrect
(1) Flagella and centriole both have 9 peripheral fibril
(2) In flagella and centriole 9 radial spokes are present
(3) Centriole form basal body of cilia and flagella
(4) Centriole, cilia, flagella have 9+2 fibrilar arrangement.

21. Which statement is incorrect–
(1) Nucleolus is involved in r-RNA synthesis
(2) Content of nucleolus is different from nucleoplasm
(3) Chromatin contain DNA, basic proteins
(4) All

22. Microbody, glyoxisome is present in
(1) Plant only (2) Animal only (3) Both (4) None

23. Peroxisomes are rich in

(1) Reductive enzymes (2) Lytic enzymes
(3) Riboxidative enzymes (4) Catalase enzymes

24. Lampbrush chromosomes found in oocytes occur in
(1) Leptotene (2) Zygotene (3) Pachytene (4) Diplotene.

25. Chromosomes appearing rod shaped during anaphase are
(1) Acrocentric (2) Metacentric (3) Submetacentric (4) Telocentric.

26. Which one ensures maintenance of chromosome number from generation to generation?
(1) Mitosis (2) Meiosis (3) Splicing (4) Metamorphosis

27. The function of peroxisomes is
(1) H_2O_2 destruction (2) conversion of fats to carbohydrates
(3) detoxification of heavy metals (4) oxidative phosphorylation

28. Sister chromatids are joined at
(1) Chromocentre (2) Metacentre (3) Centromere (4) Telomere

29. What is true for mitosis?
(1) It has two divisions (2) It maintains number of chromosomes
(3) It occurs in somatic cells only (4) It occurs in somatic cells as well as gonads

30. In metaphase-I chromsomes are in
(1) Tetrad stage (2) Dyad stage (3) Diploid nature (4) Attract each other.

31. Longest phase of meiosis is
(1) Prophase-I (2) Prophase-II (3) Anaphase-I (4) Metaphase-II

32. Chemical for arresting cell division is extracted from
(1) *Crocus* (2) *Colchicum* (3) *Chrysanthemum* (4) *Dalbergia*

33. A chromosome carrying centromere at one end is
(1) Acrocentric (2) Telocentric (3) Metacentric (4) Submetacentric.

34. Which is present nearest to plasma membrane in plant cell?
(1) Secondary wall (2) Primary wall (3) Middle lamella (4) Tonoplast.

35. Welded areas between two adjacent animal cells are
(1) Interdigitations (2) Desmosomes (3) Gap junctions (4) Intercellular bridges.

36. Orange-yellow colours of flowers and fruits are due to
(1) Chloroplasts (2) Leucoplasts (3) Aleuroplasts (4) Chromoplasts

37. Cell shape is mainly determined by
(1) Vacuole (2) Endoplasmic reticulum
(3) Microtubules (4) Cell membrane

38. Pairing of homologous chromosomes in zygotene is called
(1) Synapse (2) Synapsis (3) Crossing over (4) Terminalisation.

39. Exchange of segments between nonsister chromatids of homolgous chromosomes is

(1) Crossing over (2) Translocation (3) Linkage (4) Inversion.

40. Chiasmata are most appropriately observed in meiosis during
(1) Diakinesis (2) Diplotene (3) Metaphase II (4) Pachytene

41. Ribosomes that occur exclusively in mitochondria are
(1) 70S (2) 55S (3) 30S (4) 50S

42. Single membrane bound organelles are
(1) Lysosome (2) Sphaerosome (3) Glyoxysome (4) All of these

43. Pectin occurs in
(1) Blood proteins (2) Plant cell walls (3) Milk protein (4) Liver cell

44. The one located inside a vacuole is
(1) Tonoplast (2) Matrix (3) Ergastic substances (4) Cell sap

45. Plant cells store fat in
(1) Peroxisome (2) Lysosome (3) Sphaerosome (4) Microsome

46. Phagosomes and pinosomes are collectively called
(1) Residual bodies (2) Autophagic bodies (3) Digestive vacuoles (4) Endosomes.

47. Cyclin is required for cell cycle. Which other molecule is essential for completion of cell cycle?
(1) CCK (2) CKC (3) CDK (4) CKD.

48. Chromosomes are least condensed during
(1) Telophase (2) Interphase (3) Metaphase (4) Anaphase

49. During meiosis
(1) Linkage is disturbed
(2) Homologous chromosomes are separated
(3) Homologous chromosomes do not segregate
(4) All of the above.

50. A plant cell has 12 chromosomes at the end of mitosis. How many chromosomes would it have in the G_2 phase of its next cell cycle?
(1) 6 (2) 8 (3) 12 (4) 24

51. Astral rays arise from
(1) Centriole (2) Cytoplasm (3) Chromatid (4) Centromere

52. In which stage of meiosis the structures, number and shape of chromosomes can be observed.
(1) Prophase I (2) Metaphase I (3) Anaphase I (4) Telophase I.

53. Arrangement of ciliary microtubules is
(1) 9 + 2 (2) 9 + 4 (3) 9 + 3 (4) 9 + 9

54. Which cell organelle connect nuclear envelope with cells membrane?
(1) Lysosome (2) Golgi body
(3) Endoplasmic reticulum (4) Mitochondria

55. A clear zone around Golgi apparatus is
(1) Zone of separation (2) Zone of transition (3) Zone of inclusion (4) Zone of exclusion

56. A cell plate is laid during
(1) cytokinesis (2) karyokinesis (3) interphase (4) None of these

57. Number of protofilaments present in a microtubule is
(1) 15 (2) 13 (3) 10 (4) 5

58. Fat storing plastids are
(1) Amyloplasts (2) Aleuroplasts (3) Elaioplasts (4) All of these

59. Lysosomes are the reservoirs of
(1) Hydrolytic enzymes (2) RNA and protein
(3) Secretory glycoproteins (4) Fats

60. Movement of ions or molecules against electrochemical gradient is called
(1) Pinocytosis (2) Diffusion
(3) Active transport (4) Brownian movement.

61. Spindle fibre is made up of
(1) tubulin (2) humulin
(3) intermediate filament (4) flagellin

62. In which cell organelles, lipoprotein covering is absent?
(1) Ribosomes (2) Lysosomes (3) Mitochondria (4) Peroxisomes

63. Quantasomes are present in
(1) Chloroplast (2) Mitochondria (3) Golgi body (4) Lysosome

64. During cell cycle, RNA and non-histone proteins are synthesised in
(1) S-phase (2) G_0-phase (3) G_2 - phase (4) M-phase

65. Balbiani rings are the centre for
(1) DNA synthesis (2) RNA synthesis (3) Both (1) and (2) (4) None of the above

Exercise-2

1. The biochemical component of erythrocyte membrane determining blood group is **(3rd NSEB)**
(1) lipoprotein (2) glycoprotein (3) phosphoprotein (4) hemoprotein

2. If the haploid number for a species is three each dividing diploid cell during mitosis will have how many chromatids at anaphase ? **(6th CBO)**
(1) 3 (2) 6 (3) 9 (4) 12

3. A high surface area to volume ratio in cells is important because it **(3rd ABO)**
(1) enables efficient transfer of wastes, nutrients and gases across the cell membrane
(2) prevents overproduction of cell proteins due to structural limitations
(3) allows many antigens on the surface for identification of self and non self

(4) provides for better structural support to cope with externel physical pressure

(5) allows for cell division

4. Which statement is false? **(1st CBO)**

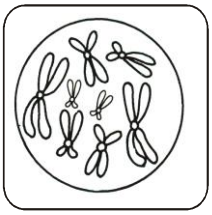
(1) During the process of exocytosis, the lumen (inner) surface of a secretory vesicle becomes the inside of the plasma (cell) membrane

(2) Cilia, microtubules and flagella are all associated with movement in cells

(3) A function of the nucleus is duplicating the genes for cell division

(4) Proteins that are to be secreted by the cell are generally synthesized by the membrane-bound ribo somes

5. Which of the following description describes the cell shown in figure? **(4th NSO I L)**



(1) 8 chromosomes, 4 homologous pair (2) 8 chromosomes, 8 homologous pairs

(3) 16 chromosomes, 8 homologous pair (4) 16 chromohomes, 4 homologous pairs

6. Which statement best describes the process of endocytosis? **(4th CBO)**

(1) A vesicle within a cell fuses with the plasma membrane and releases its contents to the outside

(2) Solid particles of liquids are taken up by a cell through invagination of the plasma membrane

(3) Investmemt in one cytosis reduces the ability of the parent to assist another cytosis

(4) One region of an embryo directs the development of a neighbouring region of an embryo through movement of cells

(5) An organism obtains its energy from light and organic compounds

7. Match the following cellular organelles with their functions **(3rd NSO II L)**

A. Rough endoplasmic reticulum	1. Makes ATP
B. Mitochondria	2. Convert cellular polymers to monomers
C. Golgi complex	3. Synthesize proteins to be used inside the cell
D. Free ribosomes	4. Synthesize proteins to be used outside the cell
E. Lysosomes	5. Move materials out of the cell

Codes : A B C D E

(1) 2 1 5 3 4 (2) 3 1 2 4 5 (3) 4 1 5 3 2 (4) 5 4 3 1 2

8. Fluid mosaic model depicts the 3-dimensional structure of cell membrane and can explain many of the vital membrane functions. Which one of the following statements is inconsistent with it? **(2nd ABO)**

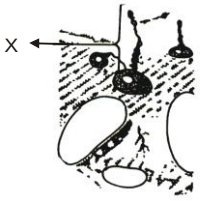
(1) Penetration of compounds through membrane does not depend on molecular size

(2) Protein-lined pores traverse the lipid bilayer

(3) Proteins and lipids of the membrane are in dynamic fluid stages

(4) The lipid bilayer is sandwiched between proteins

9. Structure of plasma membrane is shown. Here 'X' indicates : **(4th NSEB)**



(1) glycoprotein (2) cholesterol tail
(3) peripheral protein (4) cytoskeleton

10. Centrioles **(8th CBO)**

(1) hold sister chromatids together during metaphase
(2) are duplicated before cell division
(3) are only present during cell division
(4) consist of DNA and histones
(5) are found in plants cells

11. A red blood corpuscle (RBC) was kept in a solution and treated so that it become inside-out. What will be the polarity of the phospholipid bilayer in this cell?

(1) (2) (3) (4)

12. Membrane compositions of three cell types are tabulated below. **(INBO 2009)**

Cell Type	Membrane Composition (%)		
	Protein	Phospholipid	Sterol
Rat liver cell	46	30	20
Maize leaf cell	40	35	8
E. coli	74	26	0

The % composition of inner mitochondrial membrane is likely to be

(1) 40 : 30 : 20 (2) 42 : 33 : 9 (3) 43 : 33 15 (4) 76 : 24 : 0

13. A Few cells and associated entities are listed. Which of them represents the correct ascending order of the size relative to each other **(NSEB-2016)**

(1) Mitochondrion < Paramecium < Human erythrocyte < E. coli
(2) Protein < Virus < Mitochondrion < Paramecium
(3) Chloroplast < Protein < Human sperm < frog egg
(4) Nuleus < protein < Paramecium < Chloroplast

14. Which of the following structure is not found in a prokaryotic cell **(NSEB-2016)**

(i) Plasma membrane (ii) Ribosomes (iii) Endoplasmic reticulum (vi) Golgi bodies

(1) i and ii (2) ii only (3) iii only (4) iii and iv

15. Which of the cellular organelles mentioned below have to import all the proteins they contains?

(NSEB-2016)

(1) Nucleus (2) Lysosomes (3) Chloroplast (4) Mitochondria

16. If a fluorescing protein is attached to many free ribosomes in a cell and the cell is photographed after a time interval, the colour will appear: **(NSEB-2016)**

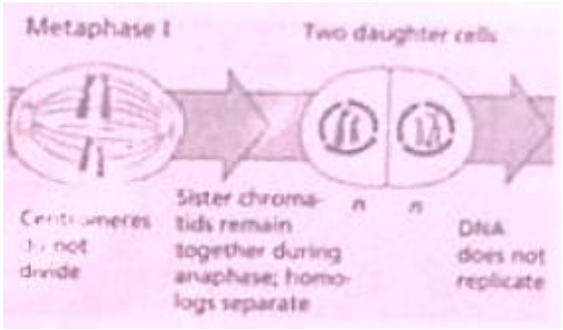
(1) in cytoplasm only

(2) in cytoplasm and along rough endoplasmic reticulum.

(3) in cytoplasm, along rough endoplasmic reticulum and along wall of nucleus

(4) in cytoplasm, along rough endoplasmic reticulum, along wall of nucleus and in the matrix of mitochondria.

17. Study the given illustration of a cell division. In which organ of the human body would this process take place? **(NSEB-2016)**



(1) Liver (2) Spleen (3) Bone marrow (4) Gonad

18. Which of the following cytoskeletal structures have maximum diversity of the component proteins?

(1) Microtubules (2) Microfilaments **(NSEB-2017)**

(3) Intermediate filaments (4) Microfibrils

19. The photosynthetic pigment that provides effective photoprotection is: **(NSEB-2017)**

(1) chlorophyll b (2) chlorophyll e (3) phycobilins (4) carotenoids

20. Which of following characters are found in prokaryotes? **(NSEB-2017)**

(i) presence of DNA

(ii) presence of flagella

(iii) presence of cytoskeleton

(iv) presence of cell wall

(v) presence of pili

(1) i, ii, iii, iv and v (2) only i, iii, and v (3) only ii, iii and iv (4) only i. ii, iv and v

21. Correct arrangement of the following in increasing size is : **(NSEB-2017)**

i. Width of biological membrane.

ii. Diameter of E. *coli* DNA.

iii. Human ribosome.

iv. Length of *E. coli* DNA.

v. Diameter of human liver cell.

(1) i, iii, ii, iv, v (2) ii, i, iii, v, iv (3) i, iii, v, ii, iv (4) ii, iii, i, iv, v

Exercise-3

PART - I : NEET/AIPMT QUESTION (PREVIOUS YEARS)

1. Telomeres **(AIPMT-2000)**
(1) Initiate RNA synthesis
(2) Help chromoatids to move towards poles
(3) Seal end of chromosomes
(4) Identify correct members of homologous pairs of chromosomes.

2. Which is not a component of mitosis? **(AIPMT-2000)**
(1) Leptotene (2) Zygotene (3) Pachytene (4) All of these

3. Spindle fibres are attached to chromosome in the region of **(AIPMT-2000)**
(1) Centrosome (2) Chromomere
(3) Chromonema (4) Kinetochore.

4. Mitotic spindle is composed of **(AIPMT-2002)**
(1) Actin (2) Actinomyosin (3) Myoglobin (4) None of the above.

5. Stage connecting meiosis-I and meiosis-II is **(AIPMT-2002)**
(1) Interphase-I (2) Interphase-II (3) Interkinesis (4) Anaphase-I.

6. At which stage chromosmes come to lie over equatorial plate **(AIPMT-2003)**
(1) Metaphase (2) Anaphase (3) Telophase (4) Prophase.

7. Procaryotic and eukaryotic flagella differ in **(AIPMT-2004)**
(1) Type of movement and placement (2) Location and mode of functioning
(3) microtubular structure and function (4) Microtubular organisation and type of movement

8. Chlorophyll occurs in chloroplast in **(AIPMT-2004)**
(1) Inner membrane (2) Thylakoid membrane
(3) Outer membrane (4) Stroma

9. What is correct ? **(AIPMT-2004)**
(1) DNA content becomes double during G_1- phase
(2) Duration of interphase is short as compared to M-phase
(3) G_2-phase follows mitotic phase
(4) DNA-replication occurs in S-phase

10. What precedes reformation of nuclear envelope in M-phase? **(AIPMT-2004)**
(1) Decondensation of chromosomes and appearance of nuclear lamina
(2) Transcription of chromosomes and resassembly of phargmoplast
(3) Formation of phragmoplast and contraction ring
(4) Formation of contraction ring and transcription from chromosome.

11. In choroplasts the chlorophyll is located in **(AIPMT-2005)**

(1) Stroma (2) Grana (3) Pyrenoid (4) Both 1 and 2.

12. As per fluid mosaic model, lipids and integral proteins can diffuse randomly. The model has been modified in several aspects. Which of the following statements is incorrect **(AIPMT-2005)**

(1) Protein of cell membrane can travel within lipid bilayer

(2) Protein of cell membrane can undergo flip-flop movement in lipid bilayer

(3) Protein can remain confined within certain domains of the membrane

(4) Many proteins remain completely embedded within lipid blilayer.

13. Organelle involved in modification and routing of newly synthesised proteins to their destination is **(AIPMT-2005)**

(1) Chloroplast (2) Lysosome

(3) Mitochondrion (4) Endoplasmic reticulum.

14. Centromere is required for **(AIPMT-2005)**

(1) Crossing over (2) Transcription

(3) Cytoplasmic cleavage (4) Movement of chromosomes towards poles

15. Which of the following statements about cilia is not correct? **(AIPMT-2006)**

(1) Organised beating of cilia is controlled by fluxes of Ca^{2+} across the membrane

(2) Cilia are hair like cellular appandages

(3) Cilia contain an outer ring of nine doublet microtubules surrounding two singlet microtubules

(4) Microtubules of cilia are composed of tubulin.

16. Which of the following statement regarding mitochondrial membrane is not correct? **(AIPMT-2006)**

(1) Outer membrane resembles a sieve

(2) Outer membrane is permeable to all kinds of molecules

(3) Enzymes of electron transport chain are embedded in outer membrane

(4) Inner membrane is highly convoluted forming a series of infoldings.

17. Which is not constituent of cell membrane? **(AIPMT-2007)**

(1) Glycolipids (2) Phospholipids (3) Cholesterol (4) Proline.

18. Which is wrong? **(AIPMT-2007)**

(1) Both chloroplast and mitochondrion have an internal compartment or thylakoid space bounded by thylakoid membrane

(2) Both contain DNA

(3) Chloroplast is generally larger

(4) Both are covered by double membrane.

19. The two subunits of ribosomes remain united at a critical ion level of **(AIPMT-2008)**

(1) Magnesium (2) Calcium (3) Copper (4) Manganese.

20. Polysome is formed by **(AIPMT-2008)**

(1) A ribosome with several subunits

(2) Ribosomes attached to each other in a linear arrangement

(3) Several ribosomes attached to a single mRNA

(4) Many ribosomes attached to strand of endoplasmic reticulum

21. Vacuole in a plant cell? **(AIPMT-2008)**

(1) Lacks membrane and contains air

(2) Lacks membrane and contains water and excretory substances

(3) Is membrane bound and contains storage proteins and lipids

(4) Is membrane bound and contains water and excretory substances.

22. In germinating seeds fatty acids are degraded exclusively in the **(AIPMT-2008)**

(1) Peroxisomes (2) Glyoxysomes

(3) Mitochondria (4) Proplastids

23. Keeping in view the fluid mosaic model for the structure of cell membrane, which one of the following statement is correct with respect to movements of lipids and proteins from one lipid monolayer to the other (described as flip-flop movement)? **(AIPMT-2008)**

(1) While proteins can flip-flop, lipids cannot (2) Neither lipids nor proteins can flip-flop

(3) Both lipids and proteins can flip-flop (4) While lipids can rarely flip-flop, proteins cannot.

24. Genes present in the cytoplasm of eukaryotic cells are found in **(AIPMT-2008)**

(1) Lysosomes and peroxisomes

(2) Mitochondria and inherited via egg cytoplasm

(3) Golgi bodies and smooth endoplasmic reticulum

(4) Plastids and inherited via male gamete.

25. Plasmodesmata are **(AIPMT-2009)**

(1) Connection between adjacent plant cells

(2) Lignified cemented layers bewteen cells

(3) Locomotary stuctures

(4) Membranes connecting the nucleus with plasmalemma

26. Stroma in the chloroplasts of higher plant contains **(AIPMT-2009)**

(1) ChlorophyII (2) Light-independent reaction enzymes

(3) Light-dependent reaction enzymes (4) Ribosomes

27. Middle lamella is composed mainly of **(AIPMT-2009)**

(1) Phosphoglycerides (2) Hemicellulose (3) Muramic acid (4) Calcium pectate

28. The plasma membrane consists mainly of **(AIPMT-2010)**

(1) Proteins embedded in a phospholipid bilayer

(2) Proteins embedded in a polymer of glucose molecules

(3) Proteins embedded in a carbohydrate bilayer

(4) Phospholipids embedded in a protein bilayer

29. Which one of the following structures between two adjacent cells is an effective transport pathway? **(AIPMT-2010)**
(1) Plastoquinones (2) Endoplasmic reticulum
(3) Plasmalemma (4) Plasmodesmata

30. During mitosis ER and nucleolus begin to disappear at **(AIPMT-2010)**
(1) Early metaphase (2) late metaphase (3) Early prophase (4) Late prophase

31. Important site for formation of glycoproteins and glycolipids in **(AIPMT-2011)**
(1) Vacuole (2) Golgi apparatus (3) Plastid (4) Lysosome

32. Peptide synthesis inside a cell takes place in **(AIPMT-2011)**
(1) Chloroplast (2) Mitochondria (3) Chromoplast (4) Ribosomes

33. Which one of the following organisms is not an example of eukaryotic cells? **(AIPMT-2011)**
(1) *Paramecium caudatum* (2) *Escherichia coli*
(3) *Euglena viridis* (4) *Amoeba proteus*

34. In eubacteria, a cellular component that resembles eukaryotic cells is **(AIPMT-2011)**
(1) Plasma membrane (2) Nucleus (3) Ribosomes (4) Cell wall

35. Select the correct option with respect to mitosis. **(AIPMT-2011)**
(1) Chromatid separate but remain in the centre of the cell in anaphase.
(2) Chromatids start moving towards opposite poles in telophase.
(3) Golgi complex and endoplasmic reticulurn are still visible at the end of prophase.
(4) Chromosome move to the spindle equator and get aligned along equatorial plate in metaphase

36. What would be the number of chromosome of the aleurone cells of a plant with 42 chromosomes in its root tip cells? **(AIPMT-2011)**
(1) 42 (2) 63 (3) 84 (4) 21

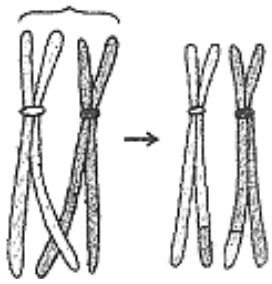
37. Ribosomal RNA is actively synthesized in **(AIPMT Pre. 2012)**
(1) Lysosomes (2) Nucleolus (3) Nucleoplasm (4) Ribosomes

38. What is true about ribosomes? **(AIPMT Pre. 2012)**
(1) The prokaryotic ribosomes are 80S, where "S" stands for sedimentation coefficient
(2) These are composed of ribonucleic acid and proteins
(3) These are found only in eukaryotic cells
(4) These are self -splicing introns of some RNAs.

39. Select the correct statement from the following regarding cell membrane. **(AIPMT Pre. 2012)**
(1) Na^+ and K^+ ions move across cell membrane by passive transport
(2) Proteins make up 60 to 70% of the cell membrane.
(3) Lipids are arranged in a bilayer with polar heads towards the inner part.
(4) Fluid mosaic model of cell membrane was proposed by Singer and Nicolson

40. During gamete formation, the enzyme recombinase participates during **(AIPMT Pre. 2012)**
(1) Metaphase - I (2) Anaphase - II (3) Prophase - I (4) Prophase - II

41. Given below is the representation of a certain event at a particular stage of a type of cell division. Which is this stage? **(AIPMT Pre. 2012)**



(1) Prophase I during meiosis (2) Prophase II during meiosis
(3) Prophase of Mitosis (4) Both prophase and metaphase of mitosis

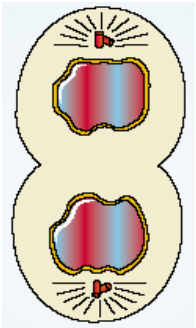
42. Which one of the following structure is an organelle within an organelle? **(AIPMT Mains 2012)**
(1) Ribosome (2) Peroxisome (3) ER (4) Mesosome

43. Which one of the following cellular parts is correctly described? **(AIPMT Mains 2012)**
(1) Thylakoids - flattened membranous sacs forming the grana of chloroplasts
(2) Centrioles - sites for active RNA synthesis
(3) Ribosomes - those on chloroplasts are larger (80s) while those in the cytoplasm are smaller (70s)
(4) Lysosomes - optimally active at a pH of about 8.5

44. Identify the meiotic stage in which the homologous chromosomes separate while the sister chromatids remain associated at their centromeres: **(AIPMT Mains 2012)**
(1) Metaphase I (2) Metaphase II (3) Anaphase I (4) Anaphase II

45. Meiosis takes place in **(NEET-2013)**
(1) Conidia (2) Gemmule
(3) Megaspore (4) Meiocyte

46. A stage in cell division is shown in the figure. Select the answer which gives correct identification of the stage with its characteristics. **(NEET-2013)**



(1)	Late anaphase	Chromosomes move away from equatorial plate, Golgi complex not present
(2)	Cytokinesis	Cell plate formed, mitochondria distributed between two daughter cells
(3)	Telophase	Endoplasmic reticulum and nucleolus not reformed yet
(4)	Telophase	Nuclear envelop reforms, Golgi complex reforms

47. The complex formed by a pair of synapsed homologous chromosomes is called **(NEET-2013)**

(1) Kinetochore (2) Bivalent (3) Axoneme (4) Equatorial plate

48. Which one of the following organelle in the figure correctly matches with its function? **(NEET-2013)**

(1) Golgi apparatus, protein synthesis

(2) Golgi apparatus, formation of glycolipids

(3) Rough endoplasmic reticulum, protein synthesis

(4) Rough endoplasmic reticulum, formation of glycoproteins

49. Which of the following criteria does not pertain to facilitated transport? **(NEET-2013)**

(1) High selectivity

(2) Transport saturation

(3) Uphill transport

(4) Requirement of special membrane proteins

50. A major site for synthesis of lipids is **(NEET-2013)**

(1) SER (2) Symplast (3) Nucleoplasm (4) RER

51. The Golgi complex plays a major role **(NEET-2013)**

(1) in digesting proteins and carbohydrates

(2) as energy transferring organelles

(3) in post translational modification of proteins and glycosidation of lipids

(4) in trapping the light and transforming it into chemical energy

52. Which structures perform the function of mitochondria in bacteria? **(AIPMT-2014)**

(1) Nucleoid (2) Ribosomes (3) Cell wall (4) Mesosomes

53. The solid linear cytoskeletal elements having a diameter of 6 nm and made up of a single type of monomer are known as : **(AIPMT-2014)**

(1) Microtubules (2) Microfilaments

(3) Intermediate filaments (4) Lamins

54. The osmotic expansion of a cell kept in water is chiefly regulated by: **(AIPMT-2014)**

(1) Mitochondria (2) Vacuoles (3) Plastids (4) Ribosomes

55. Match the following and select the correct answer : **(AIPMT-2014)**

(a) Centriole (i) Infoldings in mitochondria

(b) Chlorophyll (ii) Thylakoids

(c) Cristae (iii) Nucleic acids

(d) Ribozymes (iv) Basal body cilia or flagella

	A	B	C	D
(1)	(iv)	(ii)	(i)	(iii)
(2)	(i)	(ii)	(iv)	(iii)
(3)	(i)	(iii)	(ii)	(iv)
(4)	(iv)	(iii)	(i)	(ii)

56. During which phase(s) of cell cycle, amount of DNA in a cell remains at 4 C level if the initial amount is denoted as 2C ? **(AIPMT-2014)**

(1) G_0 and G_1 (2) G_1 and S (3) Only G_2 (4) G_2 and M

57. In 'S' phase of the cell cycle: **(AIPMT-2014)**

(1) amount of DNA doubles in each cell.

(2) amount of DNA remains same in each cell.

(3) chromosome number is increased

(4) amount of DNA is reduced to half in each cell.

58. The enzyme recombinase is required at which stage of meiosis: **(AIPMT-2014)**

(1) Pachytene (2) Zygotene

(3) Diplotene (4) Diakinesis

59. Which of the following are not membrane-bound? **(Re-AIPMT-2015)**

(1) Ribosomes (2) Lysosomes

(3) Mesosomes (4) Vacuoles

60. The function of the gap junction is to **(Re-AIPMT-2015)**

(1) facilitate communication between adjoining cells by connecting the cytoplasm for rapid transfer of ions, small molecules and some large molecules.

(2) separate two cells from each other

(3) stop substance from leaking across a tissue

(4) performing cementing to keep neighbouring cells together.

61. Which of the following structure is not found in a prokaryotic cell? **(Re-AIPMT-2015)**

(1) Ribosome (2) Mesosome (3) Plasma membrane (4) Nuclear envelope

62. The structures that help some bacteria to attach to rocks and / or host tissues are: **(Re-AIPMT-2015)**

(1) Fimbriae (2) Mesosomes (3) Holdfast (4) Rhizoids

63. Chromatophores take part in : **(Re-AIPMT-2015)**

(1) Growth (2) Movement (3) Respiration (4) Photosynthesis

64. Identify the correct order of organisation of genetic material from largest to smallest : **(Re-AIPMT-2015)**

(1) Genome, chromosome, nucleotide, gene
(2) Genome, chromosome, gene, nucleotide
(3) Chromosome, genome, nucleotide, gene
(4) Chromosome, gene, genome, nucleotide

65. A protoplast is a cell : **(Re-AIPMT-2015)**
(1) without nucleus (2) undergoing division
(3) without cell wall (4) without plasma membrane

66. Balbiani rings are sites of : **(Re-AIPMT-2015)**
(1) Nucleotide synthesis (2) Polysaccharide synthesis
(3) RNA and protein synthesis (4) Lipid synthesis

67. Match the columns and identify the correct option. **(Re-AIPMT-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)	**(b)**	**(c)**	**(d)**
(1)	(iii)	(iv)	(i)	(ii)
(2)	(iii)	(i)	(iv)	(ii)
(3)	(iii)	(iv)	(ii)	(i)
(4)	(iv)	(iii)	(i)	(ii)

68. Cellular organelles with membranes are: **(Re-AIPMT-2015)**
(1) chormosomes, ribosomes and endoplasmic reticulum
(2) endoplasmic reticulum, ribosomes and nuclei
(3) lysosomes, Golgi apparatus and mitochondria
(4) nuclei, ribosomes and mitochondria

69. Arrange the following events of meiosis in correct sequence: **(Re-AIPMT-2015)**
(a) Crossing over
(b) Synapsis
(c) Terminalisation of chiasmata
(d) Disappearance of nucleolus
(1) (b), (a), (c), (d) (2) (a), (b), (c), (d) (3) (b), (c), (d), (a) (4) (b), (a), (d), (c)

70. Water soluble pigments found in plant cell vacuoles are: **(NEET-1-2016)**
(1) Anthocyanins (2) Xanthophylls (3) Chlorophylls (4) Carotenoids

71. Mitochondria and chloroplast are: **(NEET-1-2016)**

(a) Semi-autonomous organelles

(b) Formed by division of pre-existing organelles and they contain DNA but lack protein synthesizing machinery.

Which one of the following options is correct?

(1) Both (a) and (b) are false. (2) Both (a) and (b) are correct.

(3) (b) is true but (a) is false. (4) (a) is true but (b) is false.

72. Which of the following is not a feature of the plasmids? **(NEET-1-2016)**

(1) Single - stranded (2) Independent replication

(3) Circular structure (4) Transferable

73. In meiosis crossing over is initiated at: **(NEET-1-2016)**

(1) Diplotene (2) Pachytene

(3) Leptotene (4) Zygotene

74. Which of the following is not a characteristic feature during mitosis in somatic cells? **(NEET-1-2016)**

(1) Synapsis (2) Spindle fibres

(3) Disappearance of nucleolus (4) Chromosome movement

75. Microtubules are the constituents of: **(NEET-1-2016)**

(1) Centrosome, Nucleosome and Centrioles (2) Cilia, Flagella and Peroxisomes

(3) Spindle fibres, Centrioles and Cilia (4) Centrioles, Spindle fibres and Chromatin.

76. Spindle fibres attach on to: **(NEET-1-2016)**

(1) Kinetosome of the chromosome (2) Telomere of the chromosome

(3) Kinetochore of the chromosome (4) Centromere of the chromosome

77. Which one of the following cell organelles is enclosed by a single membrane? **(NEET-1-2016)**

(1) Nuclei (2) Mitochondria

(3) Chloroplasts (4) Lysosomes

78. A cell at telophase stage is observed by a student in a plant brought from the field. He tells his teacher that this cell is not like other cells at telophase stage. There is no formation of cell plate and thus the cell is containing more number of chromosomes as compared to other dividing cells. This would result in **(NEET-1-2016)**

(1) Polyteny (2) Aneuploidy

(3) Polyploidy (4) Somaclonal variation

79. A cell organelle containing hydrolytic enzymes is **(NEET-2-2016)**

(1) mesosome (2) lysosome (3) microsome (4) ribosome

80. During cell growth, DNA synthesis takes place in **(NEET-2-2016)**

(1) M phase (2) S Phase (3) G1 phase (4) G2 phase

81. When cell has stalled DNA replication fork, which checkpoint should be predominantly activated? **(NEET-2-2016)**

(1) Both G2/M and M (2) G1/S (3) G2/M (4) M

82. Match the stages of meiosis in Column-I to their characteristic features in Column-II and select the correct option using the codes given below: **(NEET-2-2016)**

Column-I	**Column-II**
a. Pachytene	(i) Pairing of homologous chromosomes
b. Metaphase I	(ii) Terminalization of chiasmata -
c. Diakinesis	(iii) Crossing-over takes place
d. Zygotene	(iv) Chromosomes align at equatorial plate

Codes:

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

83. Which of the following cell organells is responsible for extracting energy from carbohydrates to form ATP ? **(NEET-2017)**

(1) Lysosome (2) Ribosome (3) Chloroplast (4) Mitochondrion

84. Anaphase promoting Complex (APC) is a protein degradation machinery necessary for proper mitosis of animal cells. If APC is defective in a human cell, which of the following is expected to occur?

(1) Chromosomes will not condense **(NEET-2017)**

(2) Chromosomes will be fragmented

(3) Chromosomes will not segregate

(4) Recombination of chromosome arms will occur

85. Which of the following options gives the correct sequences of events during mitosis? **(NEET-2017)**

(1) Condensation → nuclear membrane disassembly → crossing over → segregation → telophase

(2) Condensation → nuclear membrane disassembly → arrangement at equator → centromere division → segregation → telophase

(3) Condensation→ crossing over → nuclear membrane disassembly → segregation → telophase

(4) Condensation → arrangement at equator → centromere division → segregation → telophase

86. Which of the following components provides sticky character to the bacterial cell? **(NEET-2017)**

(1) Cell wall (2) Nuclear membrane

(3) plasma membrane (4) Glycocalyx

87. Which of the following events does *not* occur in rough endoplasmic reticulum? **(NEET-2018)**

(1) Protein folding (2) Phospholipid synthesis

(3) Cleavage of signal peptide (4) Protein glycosylation

88. Select the *incorrect* match: **(NEET-2018)**

(1) Lampbrush Chromosome - Diplotene bivalents

(2) Polytene chromosomes - Oocytes of amphibians

(3) Submetacentric chromosomes - L-shaped chromososmes

(4) Allosomes - Sex chromosomes

89. Many ribosomes may associate with a single mRNA to form multiple copies of a polypeptide simultaneously. Such strings of ribosomes are termed as **(NEET-2018)**

(1) Polysome (2) Nucleosome (3) Plastidome (4) Polyhedral bodies

90. The stage during which separation of the paired homologous chromosomes begins is **(NEET-2018)**
(1) Pachytene (2) Zygotene (3) Diakinesis (4) Diplotene

91. Which of the following is true for nucleolus? **(NEET-2018)**
(1) Larger nucleoli are present in dividing cells.
(2) It is a site for active ribosomal RNA synthesis.
(3) It takes part in spindle formation.
(4) It is a membrane-bound structure.

92. The Golgi complex participates in **(NEET-2018)**
(1) Fatty acid breakdown *(2)* Activation of amino acid
(3) Respiration in bacteria (4) Formation of secretory vesicles

93. Cells in G_0 phase : **(NEET-1-2019)**
(1) terminate the cell cycle (2) exit the cell cycle
(3) enter the cell cycle (4) suspend the cell cycle

94. The concept of "Omnis cellula-e cellula"regard cell division was first proposed by : **(NEET-1-2019)**
(1) Aristotle (2) Rudolf Virchow (3) Theodore Schwann (4) Schleiden

95. The shorter and longer arms of a submetacentric chromosome are referred to as : **(NEET-1-2019)**
(1) m-arm and n-arm respectively (2) s-arm and l-arm respectively
(3) p-arm and q-arm respectively (4) q-arm and p-arm respectively

96. The correct sequence of phases of cell cycle is : **(NEET-1-2019)**
(1) G1 $\rightarrow$ S $\rightarrow$ $G_2\rightarrow$ M (2) M$\rightarrow G_1\rightarrow G_2\rightarrow$ S
(3) $G_1 \rightarrow G_2 \rightarrow$ S $\rightarrow$ M (4) S $\rightarrow G_1 \rightarrow G_2 \rightarrow$ M

97. Which of the following pair of oragnelles does not contain DNA? **(NEET-1-2019)**
(1) Nuclear envelope and Mitochondria (2) Mitochondria and Lysosome
(3) Chloroplast and Vacuoles (4) Lysosomes and Vacuoles

98. Which of the following statements is not correct **(NEET-1-2019)**
(1) Lysosornes are formed by the process of packaging in the endoplasmic reticulum
(2) Lysosomes have numerous hydrolytic enzymes.
(3) The hydrolytic enzymes of lysosomes are active under acidic pH.
(4) Lysosomes are membrane bound strucutres

99. Match the following cell structure with its characteristic feature : **(NEET-2-2019)**

(a) Tight junctions	(i) Cement neighbouring cells together to form sheet
(b) Adhering junctions	(ii) Transmit information through chemical to another cells
(c) Gap junctions	(iii) Establish a barrier to prevent leakage of fluid across epithelial cells
(d)Synaptic junctions	(iv) Cytoplasmic channels to facilitate communication between adjacent cells

Select correct option from the following :
(1) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
(2) (a)-(iv), (b)-(ii), (c)-(i), (d)-(iii)
(3) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
(4) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)

100. Which of the following cell organelles is present in the highest number in secretory cells? **(NEET-2-2019)**

(1) Mitochondria (2) Golgi complex
(3) Endoplasmic reticulum (4) Lysosomes

101. Non-membranous nucleoplasmic structures in nucleus are the site for active synthesis of **(NEET-2-2019)**

(1) protein synthesis (2) mRNA (3) rRNA (4) tRNA

102. Which of the following nucleic acids is present in an organism having 70 S ribosomes only? **(NEET-2-2019)**

(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

103. After meiosis I, the resultant daughter cells have **(NEET-2-2019)**

(1) same amount of DNA as in the parent cell in S phase.
(2) twice the amount of DNA in comparison to haploid gamete.
(3) same amount of DNA in comparison to haploid gamete
(4) four times the amount of DNA in comparison to haploid gamete

104. Match the column I with column II. **(NEET-2-2019)**

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)

105. Crossing over takes place between which chromatids and in which stage of the cell cycle? **(NEET-2-2019)**

(1) Non-sister chromatids of non-homologous chromosomes at Zygotene stage of prophase I.
(2) Non-sister chromatids of homologous chromosomes at Pachytene stage of prophase I.
(3) Non-sister chromatids of homologous chromosomes at Zygotene stage of prophase I.
(4) Non-sister chromatids of non-homologous chromosomes at Pachytene stage of prophase I.

PART - II : AIIMS QUESTION (PREVIOUS YEARS)

1. Which of the following is present between cell walls of the plant cell **(AIIMS-1999)**

(1) Lomasome (2) Microsome (3) Lysosome (4) Middle lamella

2. Shape of metacentric chromosome in anaphase is **(AIIMS-1999)**

(1) L-shaped (2) V-shaped (3) J-shaped (4) I-shaped

3. Cell wall is absent in **(AIIMS-2000)**

(1) *Amoeba* (2) *Chara* (3) Yeast (4) *E. Coli*

4. During cell cycle, two molecules of DNA are present in chromsome during **(AIIMS-2001)**

(1) G_1 phase (2) Beginning of S-phase

(3) G_2 phase (4) End of M-phase.

5. The organelle connected with β-oxidation or fat digestion is **(AIIMS-2002)**

(1) Glyoxysome (2) Sphaerosome (3) Peroxisome (4) Mitochondrian.

6. Plasmodesmata connections help in **(AIIMS-2003)**

(1) Cytoplasmic streaming (2) Synchronous mitotic divisions

(3) Locomotion of unicellular organisms (4) Movement of substances between cells.

7. Which one is the wrong statement regarding cell organelles? **(AIIMS-2005)**

(1) Lysosomes are double membraned vesicles budded off from Golgi bodies and contain digestive enzymes

(2) Endoplasmic reticulum consists of a network of membranous tubules and helps in transport, synthesis and secretion.

(3) Leucoplasts are bounded by two membranes, lack pigments but contain their own DNA and protein synthesising machinery.

(4) Sphaerosomes are single membrane bound and are associated with synthesis and storage of lipids.

8. When synapsis is complete all along the chromosomes, the cell is said to have entered a stage called? **(AIIMS-2005)**

(1) Diakinesis (2) Diplotene (3) Pachytene (4) Zygotene.

9. Which is common between chloroplasts, chromoplasts and leucoplasts ? **(AIIMS-2006)**

(1) Presence of pigments (2) Presence of thylakoids and grana

(3) Storage of starch, proteins and lipids. (4) Ability to multiply by a fission-like process

10. Enzyme catalase is found in **(AIIMS-2006)**

(1) Lysosome (2) Spherosome (3) Peroxisome (4) All of these

11. The telomeres of eukaryotic chromosomes consists of short sequences of **(AIIMS-2007)**

(1) Cytosine rich repeats (2) Thymine rich repeats

(3) Adenine rich repeats (4) Guanine rich repeats.

12. Match the following - **(AIIMS-2007)**

(a) tRNA	1. Linking of amino acids
(b) mRNA	2. Transfer of genetic information
(c) rRNA	3. Nucleolar organising region
(d) Peptidyl transferase	4. Transfer of amino acid from cytoplasm to ribosome.

(1) a–4, b–2,c–3, d–1 (2) a–1, b–4,c–3, d–2

(3) a–1, b–2,c–3, d–4 (4) a–1, b–3,c–2, d–4

13. What is correct about the movement of substance across the membrane in facilitated diffusion? **(AIIMS 2010)**

(1) It is an active transport

(2) It causes transport of molecules from low concentration to high concentration

(3) It is insensitive to inhibitors

(4) It is a very specific transport

14. Who invented electron microscope? **(AIIMS 2010)**

(1) Janssen (2) Edison (3) Knoll & Ruska (4) Landsteiner

15. The percentage of cell surface that is impermeable for ions is **(AIIMS 2011)**

(1) 1% (2) 99.9% (3) 90% (4) 73%

16. Satellite of chromosome is **(AIIMS 2011)**

(1) rich in RNA and deficient in DNA (2) rich in DNA and deficient in RNA

(3) rich in protein (4) lacks DNA

17. Which of the following ions are necessary for assembly of microtubules? **(AIIMS 2011)**

(1) Na^+ and K^+ (2) Ca^{2+} and Cl^- (3) Ca^+ and Mg^{2+} (4) Na^+ and Ca^{2+}

18. Basis of life are **(AIIMS 2011)**

(1) nucleic acids (2) proteins (3) nucleoproteins (4) amino acids

19. Which chromosome may lost during cell division? **(AIIMS 2012)**

(1) Giant chromosome (2) Acentric chromosome

(3) Polycentric chromosome (4) Telocentric chromosome

20. Three morphological forms of Golgi complex are **(AIIMS 2012)**

(1) Lamellae, tubules and vesicles (2) Cisternae, tubules and vesicles

(3) Cisternae, tubules and lamellae (4) Granum, thalykoids and vesicles

21. Which is the longest phase of the cell cycle? **(AIIMS - 2014)**

(1) M-phase (2) Interphase (3) Leptotene (4) S-phase

22. I. The shape of the cells may vary with the function they perform **(AIIMS-2015)**

II. Human RBC is about 7.0 m in diameter

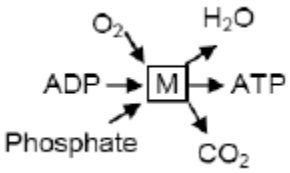
Ill. Cytoplasm is the main arena of cellular activities

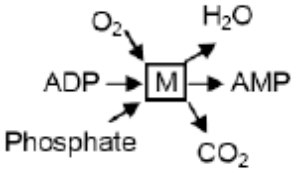
IV. Various chemical reactions' occur in cytoplasm to keep the cell in the living stage

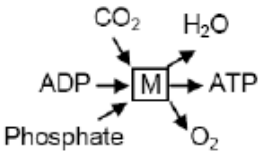
(1) All are correct (2) Only I and II are correct

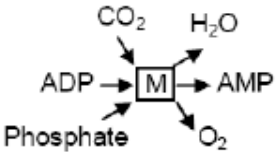
(3) Only IV is correct (4) All are wrong

23. Which of the following representation correctly explain the function of mitochondrion? **(AIIMS-2015)**

(1) 

(2) 

(3) 

(4) 

24. Which of the following statements are correct? **(AIIMS-2016)**

(i) In prokaryotic cells, a special membranous structure formed by the extension of the plasma membrane into the cell is known as polysome.

(ii) The smooth endoplasmic reticulum is the major site for synthesis of glycoproteins.

(iii) RuBisCO is the most abundant protein in the whole biosphere.

(iv) Mitochondria, chloroplasts and peroxisomes are not considered as part of endomembrane system.

(1) (iii) and (iv) (2) (i) and (ii) (3) (ii) and (iii) (4) (i) and (iv)

25. How many mitotic divisions are needed for a single cell to make 128 cells? **(AIIMS-2016)**

(1) 7 (2) 14 (3) 28 (4) 64

26. Mitochondria and chloroplast are believed to be bacterial endoymbiont because **(AIIMS-2017)**

I. they have self nucleic acid

i.e., circular *ds,* DNA and RNAs

II. *70s* ribosomes

III. their membrane resembles that of bacteria, having pour proteins.

IV. ETS and ATP forming machienary is present.

(1) I and II (2) I, II and III (3) All of these (4) I and IV

27. Identify the correct matched pair **(AIIMS-2017)**

(1) Exchange of segments of chromatids-Zygotene

(2) Terminalisation of chiasmata-Diakinesis

(3) Appearance of chiasmata-Leptotene

(4) Synapsis of homologous chromosomes-Diplotene

28. Interphase divides into **(AIIMS-2018-I)**

(1) G_1, S, G_2

(2) Mitosis

(3) Prophase, metaphase, Anaphase, Telophase

(4) Cytokinesis

29. Synthesis of lipids & carbohydrates is regulated by- **(AIIMS-2018-II)**

(1) SER (2) RER (3) Ribosomes (4) Lysosomes

30. Choose the incorrect about mitochondria - **(AIIMS-2018-II)**

(1) Has 80S ribosome (2) Naked circular DNA

(3) ETS on inner mitochondrial membrane (4) Power house of the cell

31. Where does glycosylation of protein occur? **(AIIMS-2018-II)**

(1) Endoplasmic reticulum (2) Lysosomes

(3) Mitochondria (4) Chloroplast

32. Function of smooth endoplasmic reticulum is **(AIIMS-2018-III)**

(1) Synthesis of lipid (2) Synthesis of minerals

(3) Synthesis of protein (4) None

33. All the digestive enzymes like carbohydrase, protease, lipase, DNase, RNase are found in: **(AIIMS-2018-IV)**

(1) Lysosome (2) peroxisome (3) Glyoxysome (4) Vacuole

34. RNA is found in : **(AIIMS-2018-IV)**

(1) Chloroplast, mitochondria (2) Golgibody, Chloroplast

(3) Lysosome, Mitochondria (4) Centrioles, Mitochondria

Answers

EXERCISE - 1

SECTION - A

1.	(4)	**2.**	(4)	**3.**	(4)	**4.**	(4)	**5.**	(4)	**6.**	(4)	**7.**	(1)
8.	(2)												

SECTION - B

1.	(3)	**2.**	(4)	**3.**	(3)	**4.**	(3)	**5.**	(2)	**6.**	(3)	**7.**	(1)

SECTION - C

1.	(3)	**2.**	(2)	**3.**	(4)	**4.**	(4)	**5.**	(1)	**6.**	(4)		

SECTION - D

1.	(4)	**2.**	(4)	**3.**	(2)	**4.**	(3)	**5.**	(4)	**6.**	(4)	**7.**	(2)

SECTION - E

1.	(4)	**2.**	(1)	**3.**	(3)	**4.**	(4)	**5.**	(2)	**6.**	(3)	**7.**	(3)
8.	(3)	**9.**	(4)	**10.**	(4)	**11.**	(3)	**12.**	(3)	**13.**	(3)	**14.**	(4)
15.	(4)												

SECTION - F

1.	(3)	**2.**	(1)	**3.**	(2)	**4.**	(3)	**5.**	(1)	**6.**	(1)	**7.**	(2)
8.	(4)	**9.**	(1)	**10.**	(3)								

SECTION - G

1.	(4)	**2.**	(4)	**3.**	(1)	**4.**	(2)	**5.**	(3)	**6.**	(2)	**7.**	(3)
8.	(1)	**9.**	(3)										

SECTION - H

1.	(3)	**2.**	(1)	**3.**	(2)	**4.**	(4)	**5.**	(4)	**6.**	(2)		

SECTION - I

1.	(1)	**2.**	(4)	**3.**	(4)	**4.**	(3)	**5.**	(3)	**6.**	(3)	**7.**	(4)
8.	(1)	**9.**	(4)										

SECTION - J

1.	(1)	**2.**	(3)	**3.**	(4)	**4.**	(3)	**5.**	(4)	**6.**	(4)	**7.**	(1)

SECTION - K

1.	(3)	**2.**	(2)	**3.**	(2)	**4.**	(4)	**5.**	(4)	**6.**	(3)	**7.**	(3)
8.	(4)	**9.**	(4)	**10.**	(3)	**11.**	(4)						

SECTION - L

1.	(3)	**2.**	(2)	**3.**	(1)	**4.**	(1)	**5.**	(2)	**6.**	(4)	**7.**	(3)
8.	(2)												

SECTION - M

1	(1)	**2.**	(1)	**3.**	(1)	**4.**	(2)	**5.**	(2)	**6.**	(1)	**7.**	(1)
8.	(4)	**9.**	(1)	**10.**	(1)	**11.**	(3)	**12.**	(2)	**13.**	(2)	**14.**	(4)
15.	(1)	**16.**	(3)	**17.**	(3)	**18.**	(4)	**19.**	(2)	**20.**	(4)	**21.**	(4)
22.	(2)	**23.**	(4)	**24.**	(3)	**25.**	(1)	**26.**	(4)	**27.**	(4)	**28.**	(2)
29.	(4)	**30.**	(4)	**31.**	(2)	**32.**	(3)	**33.**	(3)	**34.**	(2)		

MISCELLANEOUS QUESTIONS

1.	(1)	**2.**	(1)	**3.**	(3)	**4.**	(2)	**5.**	(2)	**6.**	(4)	**7.**	(1)
8.	(3)	**9.**	(1)	**10.**	(3)	**11.**	(3)	**12.**	(3)	**13.**	(4)	**14.**	(4)
15.	(1)	**16.**	(3)	**17.**	(2)	**18.**	(4)	**19.**	(4)	**20.**	(4)	**21.**	(2)
22.	(1)	**23.**	(4)	**24.**	(4)	**25.**	(4)	**26.**	(2)	**27.**	(1)	**28.**	(3)
29.	(4)	**30.**	(1)	**31.**	(1)	**32.**	(2)	**33.**	(2)	**34.**	(1)	**35.**	(2)
36.	(4)	**37.**	(3)	**38.**	(2)	**39.**	(1)	**40.**	(2)	**41.**	(2)	**42.**	(4)
43.	(2)	**44.**	(4)	**45.**	(3)	**46.**	(4)	**47.**	(3)	**48.**	(2)	**49.**	(2)
50.	(3)	**51.**	(1)	**52.**	(2)	**53.**	(1)	**54.**	(3)	**55.**	(4)	**56.**	(1)
57.	(2)	**58.**	(3)	**59.**	(1)	**60.**	(3)	**61.**	(1)	**62.**	(1)	**63.**	(1)
64.	(3)	**65.**	(2)										

EXERCISE - 2

1.	(2)	**2.**	(4)	**3.**	(1)	**4.**	(1)	**5.**	(1)	**6.**	(2)	**7.**	(3)
8.	(4)	**9.**	(1)	**10.**	(2)	**11.**	(1)	**12.**	(4)	**13.**	(1)	**14.**	(4)
15.	(2)	**16.**	(3)	**17.**	(4)	**18.**	(3)	**19.**	(4)	**20.**	(4)	**21.**	(2)

EXERCISE - 3

PART- I

1.	(3)	**2.**	(4)	**3.**	(4)	**4.**	(4)	**5.**	(3)	**6.**	(1)	**7.**	(4)
8.	(2)	**9.**	(4)	**10.**	(1)	**11.**	(2)	**12.**	(2)	**13.**	(4)	**14.**	(4)
15.	(1)	**16.**	(3)	**17.**	(4)	**18.**	(1)	**19.**	(1)	**20.**	(3)	**21.**	(4)
22.	(2)	**23.**	(4)	**24.**	(2)	**25.**	(1)	**26.**	(2)	**27.**	(4)	**28.**	(1)
29.	(4)	**30.**	(4)	**31.**	(2)	**32.**	(4)	**33.**	(2)	**34.**	(1)	**35.**	(4)
36.	(2)	**37.**	(2)	**38.**	(2)	**39.**	(4)	**40.**	(3)	**41.**	(1)	**42.**	(1)
43.	(1)	**44.**	(3)	**45.**	(4)	**46.**	(4)	**47.**	(2)	**48.**	(3)	**49.**	(3)
50.	(1)	**51.**	(3)	**52.**	(4)	**53.**	(2)	**54.**	(2)	**55.**	(1)	**56.**	(4)
57.	(1)	**58.**	(1)	**59.**	(1)	**60.**	(1)	**61.**	(4)	**62.**	(1)	**63.**	(4)
64.	(2)	**65.**	(3)	**66.**	(3)	**67.**	(1)	**68.**	(3)	**69.**	(1)	**70.**	(1)
71.	(4)	**72.**	(1)	**73.**	(2)	**74.**	(1)	**75.**	(3)	**76.**	(3)	**77.**	(4)
78.	(3)	**79.**	(2)	**80.**	(2)	**81.**	(3)	**82.**	(2)	**83.**	(4)	**84.**	(3)
85.	(2)	**86.**	(4)	**87.**	(2)	**88.**	(2)	**89.**	(1)	**90.**	(4)	**91.**	(2)
92.	(4)	**93.**	(2)	**94.**	(2)	**95.**	(3)	**96.**	(1)	**97.**	(4)	**98.**	(1)
99.	(3)	**100.**	(2)	**101.**	(3)	**102.**	(2)	**103.**	(2)	**104.**	(1)	**105.**	(2)

PART- II

1.	(4)	**2.**	(2)	**3.**	(1)	**4.**	(3)	**5.**	(1)	**6.**	(4)	**7.**	(1)
8.	(3)	**9.**	(4)	**10.**	(3)	**11.**	(4)	**12.**	(1)	**13.**	(4)	**14.**	(3)
15.	(2)	**16.**	(1)	**17.**	(3)	**18.**	(1)	**19.**	(2)	**20.**	(2)	**21.**	(2)
22.	(1)	**23.**	(1)	**24.**	(1)	**25.**	(1)	**26.**	(3)	**27.**	(2)	**28.**	(1)
29.	(1)	**30.**	(1)	**31.**	(1)	**32.**	(1)	**33.**	(1)	**34.**	(1)		

Self Practice Paper (SPP)

1. Which function is performed by Golgi body?
(1) Protein synthesis (2) Formation of acrosome
(3) Lipid synthesis (4) Intracellular digestion

2. Which of the following is found in cyanobacteria for nitrogen fixation
(1) Mesosome (2) Gas vacuoles (3) Chromatophores (4) Heterocyst

3. Sphaerosome performs
(1) Synthesis of polypeptides (2) Extracellular digestion
(3) Transformation of membrane (4) Synthesis and storage of lipids

4. Membrane less structure is
(1) Lysosome (2) Peroxisome (3) Ribosome (4) Glyoxysome

5. What is not common in both chloroplast and mitochondria
(1) Presence of DNA & RNA (2) Presence of 70S ribosomes
(3) Presence of oxidative phosphorylation (4) Presence of double covering membranes

6. Acid phosphatase is marker enzyme of
(1) ER (2) Lysosome (3) Mitochondria (4) Golgibody

7. Cytoplasmic streaming or cyclosis is due to
(1) Microfilament (2) Intermediate filament
(3) Endoplasmic reticulum (4) Microtubules & Endoplasmic reticulum

8. Which of the following is found in E.coli bacteria
(1) Nuclear membrane (2) Chromatophore (3) Plasmid (4) 80S Ribosome

9. Which of the following is not a function of ER.
(1) Synthesis of glycogen and retinal pigments (2) Formation of nuclear membrane
(3) Detoxification of toxic substances (4) Maintain shape and size of cell

10. Synthesis of glycolipid and glycoprotein is a function of
(1) SER (2) Ribosome (3) Dictyosome (4) Chondriosome

11. Which of the following protein form Cilia/Flagella in prokaryotes
(1) Flagellin (2) Tubulin (3) Pilin (4) Glycoprotein

12. The concentration of Mg^{++} ion required for association of sub units of ribosome is
(1) 0.01 M (2) 0.001 M (3) 0.05 M (4) 0.1 M

13. Some functions like maintenance of the shape of cell, motility and mechanical support are performed by an elaborated network of filamentous proteinaceous structures in cytoplasm that is called.
(1) Endoplasmic reticulum (2) Golgibody
(3) Endomembrane system (4) Cytoskeleton

14. Which of the following is not a part of endomembrane system
(1) Golgi-complex (2) Vacuole (3) Lysosome (4) Mitochondria

15. The two neighbouring plants cells are connected by
(1) Gap junction (2) Desmosome (3) Plasmodesmata (4) Tight junction

16. The lateral diffusion of protein in the lipid bilayer occurs because lipid bilayer has
(1) Flexibility (2) Fluidity (3) Stability (4) None

17. 70S type of ribosomes are absent in
(1) Mitochondria (2) Chloroplast
(3) Bacteria (4) Rough endoplasmic reticulum

18. .....is the main area of cellular activities in both the plant and animal cells. Various chemical reactions occur in it to keep the cell in the living state.
(1) Nucelus (2) Cell membrane (3) Cytoplasm (4) Deutoplasm

19. Which of the following structure of Procaryotic cell show resemblance with Mitochondria in function-
(1) Chromatophore (2) Mesosome (3) Ribosome (4) cell membrane

20. Select the correct option
(1) Both protein and lipid can perform flip-flop movement
(2) GERL system help in formation of lysosomes & ribosomes
(3) Chlorophyll lies in the thylakoid of chloroplast
(4) Bounded ribosomes synthesize those proteins that are used inside the cell

21. Which of the following feature is not related with blue green algae.
(1) Presence of gas vacuoles (2) Presence of flagellated gametes
(3) Presence of heterocyst (4) Presence of chromatophores

22. The cell wall of algae is made of
(1) Peptidoglycan, lipopolysaccharide, cellulose (2) Cellulose, galactans, mannans, $CaCO_3$
(3) Cellulose, hemicellulose, mannans, $CaCO_3$ (4) Mucopeptide, xylan, galactan, $CaCO_3$

23. Which of the following is wrong about cell membrane.
(1) The membrane of erythrocyte has approximately 52% protein & 40% lipids.
(2) Cholesterol provides stability to the cell membrane
(3) The diameter of cell membrane is about 75 nm
(4) Singer and Nicolson(1972) proposed fluid mosaic model for it.

24. _____(i)_____ is membrane bound space in cytoplasm. Its _____(ii)_____ contains excretory products, water, pigments & is covered by a single membrane called_____(iii)_____
Here (i), (ii), (iii) are respectively
(1) (i) zone of exclusion (ii) Matrix (iii) Unit membrane
(2) (i) Thylakoid (ii) Loculus (iii) Unit membrane
(3) (i) Vacuole (ii) Cell sap (iii) Tonoplast
(4) (i) Vacuole (ii) Lumen (iii) Tonoplast

25. In animal cells steroid hormones are synthesized by
(1) Golgi body (2) SER (3) RER (4) Ribosomes

26. Select the incorrect pair

(1) Mesosome – Infolding of cell membrane
(2) Microsomes – Ribosomes of Bacteria
(3) Polysome – m-RNA + ribosomal RNA
(4) Amyloplast – Storage of starch

27. In which feature prokaryotic cell shows resemblance with eukaryotic cell.

(1) Ribosome (2) Mesosome (3) Cell membrane (4) Cell wall

28. Select the wrong pair

	Type of Cells	Shape of cells
(1)	Red blood cells	Round & biconcave
(2)	Columner epithelial cells	Long & narrow
(3)	Nerve cell	Unbranched & long
(4)	Mesophyll Cells	Round & Oval

29. Movement of polar molecule across plasma membranes is possible through

(1) Diffusion (2) Osmosis (3) Carrier proteins (4) All of above

30. Arrangement of golgi apparatus in a cell is:

(1) Convex Cis/forming face is towards cell membrane
(2) Concave Cis/forming face is towards cell membrane
(3) Convex Cis/forming face is towards Nucleus while concave trans or maturing face is towards plasma membrane.
(4) Convex Cis/forming face is towards Plasma membrane while concave trans or maturing face is towards Nucleus.

31. Zone of exclusion is found around

(1) Mitochondria (2) Golgibody
(3) Endoplasmic reticulum (4) Chloroplast

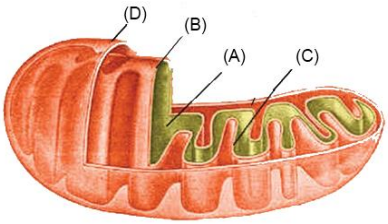
32. Which of the plastid stores protein

(1) Elaioplast (2) Chloroplast (3) Amyloplast (4) Aleuroplast

33. Cell recognition and adhesion occurs due to the following component of the plasma membrane

(1) Protein (2) Lipids (3) Proteins and lipids (4) Glycoproteins & glycolipids

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



(1) Part (D): Outer membrane – gives rise to inner membrane by splitting
(2) Part (B): Inner membrane – forms infoldings called cristae
(3) Part (C): Cristae – possess single circular DNA molecule and ribosomes
(4) Part (A): Matrix – major site for respiratory chain enzymes

35. Prokaryotic cell membrane differs from eukaryotic cell membrane in absence of -
(1) Extrinsic protein (2) Intrinsic protein (3) Phospholipids (4) Cholesterol

36. The diameter of mitochondria is
(1) 0·2 – 1 μm (2) 5 – 20 μm (3) 500 – 1000 μm (4) 150 – 300 μm

37. Most abundant lipid of cell membrane is
(1) Cholesterol (2) Phosphoglycerides (3) Glycolipid (4) Cerebroside

38. A plant cell differs from animal cell in the absence of -
(1) Mitochondria (2) Ribosomes (3) ER (4) Centrioles

39. Which of the following involve in photorespiration
(1) Chloroplast (2) Peroxisome (3) Mitochondria (4) All of the above

40. Residual bodies are responsible for ageing. The former represent
(1) Golgibody (2) Secondary lysosome
(3) Tertiary lysosome (4) Autophasic vacuole

41. These 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. They show
(1) Pili (2) Cilia (3) Flagella (4) Fimbriae

42. _____form the basal body of cilia or flagella, and spindle fibres. They help in spindle apparatus during cell division in animal cells.
(1) Microfilaments (2) Centrioles
(3) Intermediate filament (4) Microfibrils

43. Plasma membrane is asymmetrical due to
(1) Oligosacharides only (2) Proteins and phospholipids
(3) Glycoproteins and glycolipids (4) Oligosacharides, proteins and lipids

44. Which of the following is common among blue green algae, purple and green photosynthetic bacteria
(1) Presence of gas vacuoles (2) Presence of heterocyst
(3) Presence of flagella (4) Presence of cilia

45. 9 + 0 arrangement of filaments is observed in
(1) Cilia (2) Flagella (3) Centriole (4) Both 1 and 2

SPP Answers

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