

# CHAPTER 1

## Cell: The Unit of Life

### An Overview of Cell and Cell Theory

- The concept of "*Omnis cellula-e cellula*" regarding cell division was first proposed by (2019)
  - Rudolf Virchow
  - Theodor Schwann
  - Schleiden
  - Aristotle
- Cellular organelles with membranes are: (2015 Re)
  - Chromosomes, ribosomes and endoplasmic reticulum
  - Endoplasmic reticulum, ribosomes and nuclei
  - Lysosomes, Golgi apparatus and mitochondria
  - Nuclei, ribosome and mitochondria
- Which of the following structures is not found in a prokaryotic cell? (2015 Re)
  - Ribosome
  - Mesosome
  - Plasma membrane
  - Nuclear envelope
- Which of the following is not membrane-bound? (2015 Re)
  - Ribosomes
  - Lysosomes
  - Mesosomes
  - Vacuoles
- Inclusion bodies of blue-green, purple and green photosynthetic bacteria are: (2020-Covid)
  - Gas vacuoles
  - Centrioles
  - Microtubules
  - Contractile vacuoles
- The size of Pleuropneumonia-like Organism (PPLO) is: (2020-Covid)
  - 1 - 2  $\mu\text{m}$
  - 10 - 20  $\mu\text{m}$
  - 0.1  $\mu\text{m}$
  - 0.02  $\mu\text{m}$
- Which among the following is not a prokaryote? (2018)
  - Saccharomyces*
  - Mycobacterium*
  - Nostoc*
  - Oscillatoria*
- Many ribosomes may associate with a single mRNA to form multiple copies of a polypeptide simultaneously. Such strings of ribosomes are termed as (2018)
  - Polysome
  - Polyhedral bodies
  - Plastidome
  - Nucleosome
- Which of the following components provides sticky character to the bacterial cell? [OS] (2017-Delhi)
  - Cell wall
  - Nuclear membrane
  - Plasma membrane
  - Glycocalyx
- Select the wrong statement: (2016 - II)
  - Cyanobacteria lack flagellated cells.
  - Mycoplasma is a wall-less microorganism
  - Bacterial cell wall is made up of peptidoglycan.
  - Pilli and fimbriae are mainly involved in motility of bacterial cells

### Prokaryotic Cells

- Given below are two statements: (2022)  
 Statement I: Mycoplasma can pass through less than 1 micron filter size.  
 Statement II: Mycoplasma are bacteria with cell wall  
 In the light of the above statements, choose the most appropriate answer from the options given below.
  - Statement I is incorrect but Statement II is correct
  - Both Statement I and Statement II are correct
  - Both statement I and statement II are incorrect
  - Statement I is correct but Statement II is incorrect
- Which of the following statements about inclusion bodies is incorrect? (2020)
  - These are involved in ingestion of food particles.
  - They lie free in the cytoplasm
  - These represent reserve material in cytoplasm
  - They are not bound by any membrane
- Select the mismatch: (2016 - II)
  - Protists-Eukaryotes
  - Methanogens-Prokaryotes
  - Gas vacuoles-Green bacteria
  - Large central vacuoles-Animal cells
- A complex of ribosomes attached to a single strand of RNA is known: (2016 - I)
  - Polysome
  - Polymer
  - Polypeptide
  - Okazaki fragment
- Which one of the following is not an inclusion body found in prokaryotes? (2015)
  - Glycogen granule
  - Polysome
  - Phosphate granule
  - Cyanophycean granule
- Chromatophores take part in: (2015 Re)
  - Growth
  - Movement
  - Respiration
  - Photosynthesis

17. The structures that help some bacteria to attach to rocks and or host tissues are: (2015 Re)  
 a. Fimbriae                      b. Mesosomes  
 c. Holdfast                      d. Rhizoids
18. The motile bacteria are able to move by: (2014)  
 a. Pili                              b. Fimbriae  
 c. Flagella                      d. Cilia

### Endomembrane System

19. The organelles that are included in the endomembrane system are: (2021)  
 a. Endoplasmic reticulum, Golgi complex, Lysosomes and Vacuoles.  
 b. Golgi complex, Mitochondria, Ribosomes and Lysosomes.  
 c. Golgi complex, Endoplasmic reticulum, Mitochondria and Lysosomes.  
 d. Endoplasmic reticulum, Mitochondria, Ribosomes and Lysosomes.
20. Which is the important site of formation of glycoproteins and glycolipids in eukaryotic cells? (2020)  
 a. Peroxisomes                      b. Golgi bodies  
 c. Polysomes                      d. Endoplasmic reticulum
21. Which of the following statements is **not** correct? (2019)  
 a. Lysosomes have numerous hydrolytic enzymes.  
 b. The hydrolytic enzymes of lysosomes are active under acidic pH.  
 c. Lysosomes are membrane bound structures.  
 d. Lysosomes are formed by the process of packaging in the endoplasmic reticulum.
22. The Golgi complex participates in (2018)  
 a. Fatty acid breakdown  
 b. Formation of secretory vesicles  
 c. Respiration in bacteria  
 d. Activation of amino acid
23. Which of the following events does not occur in rough endoplasmic reticulum? (2018)  
 a. Protein folding                      b. Protein glycosylation  
 c. Cleavage of signal peptide      d. Phospholipid synthesis
24. A cell organelle containing hydrolytic enzymes is: (2016 - II)  
 a. Ribosome                      b. Mesosome  
 c. Lysosome                      d. Microsome
25. Select the correct matching in the following pairs: (2015)  
 a. Rough ER – Synthesis of glycogen  
 b. Rough ER – Oxidation of fatty acids  
 c. Smooth ER – Oxidation of phospholipids  
 d. Smooth ER – Synthesis of lipids
26. The osmotic expansion of a cell kept in water is chiefly regulated by: (2014)  
 a. Ribosomes                      b. Mitochondria  
 c. Vacuoles                      d. Plastids

27. Which one of the following organelle in the figure correctly matches with its function? (2013)



- a. Rough endoplasmic reticulum, protein synthesis  
 b. Rough endoplasmic reticulum, formation of glycoproteins  
 c. Golgi apparatus, protein synthesis  
 d. Golgi apparatus, formation of glycolipids
28. A major site for synthesis of lipids is: (2013)  
 a. Nucleoplasm                      b. RER  
 c. SER                              d. Symplast
29. The Golgi complex plays a major role: (2013)  
 a. In post translational modification of proteins and glycosidation of lipids  
 b. In trapping the light and transforming it into chemical energy  
 c. In digesting proteins and carbohydrates  
 d. As energy transferring organelles

### Mitochondria, Plastids, Ribosomes

30. Which of the following pair of organelles does **not** contain DNA? (2019)  
 a. Mitochondria and Lysosomes  
 b. Chloroplast and Vacuoles  
 c. Lysosomes and Vacuoles  
 d. Nuclear envelope and Mitochondria
31. Which of the following statements regarding mitochondria is incorrect? [OS] (2019)  
 a. Outer membrane is permeable to monomers of carbohydrates, fats and proteins.  
 b. Enzymes of electron transport are embedded in outer membrane.  
 c. Inner membrane is convoluted with infoldings.  
 d. Mitochondrial matrix contains single circular DNA molecule and ribosomes.
32. Which of the following cell organelles is responsible for extracting energy from carbohydrates to form ATP? (2017-Delhi)  
 a. Lysosome                      b. Ribosome  
 c. Chloroplast                      d. Mitochondrion
33. Mitochondria and chloroplast are  
 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? (2016-I)  
 a. Both (A) and (B) are correct  
 b. (B) is true but (A) is false  
 c. (A) is true but (B) is false  
 d. Both (A) and (B) are false

34. The structures that are formed by stacking of organized flattened membranous sacs in the chloroplasts are: (2015)
- Stroma lamellae
  - Stroma
  - Cristae
  - Grana
35. DNA is not present in: (2015)
- Nucleus
  - Mitochondria
  - Chloroplast
  - Ribosomes
36. Which structures perform the function of mitochondria in bacteria? (2014)
- Mesosomes
  - Nucleoid
  - Ribosomes
  - Cell wall

### Cytoskeleton, Cilia and Flagella, Centrosome and Centrioles

37. Match the following columns and select the correct option: (2020-Covid)

Column-I		Column-II	
A.	Smooth Endoplasmic Reticulum	i.	Protein synthesis
B.	Rough endoplasmic reticulum	ii.	Lipid synthesis
C.	Golgi complex	iii.	Glycosylation
D.	Centriole	iv.	Spindle formation

- (A) (B) (C) (D)
- (iii) (i) (ii) (iv)
  - (iv) (ii) (i) (iii)
  - (i) (ii) (iii) (iv)
  - (ii) (i) (iii) (iv)
38. Microtubules are the constituents of: (2016-I)
- Cilia, Flagella and Peroxisomes
  - Spindle fibres, Centrioles and Cilia
  - Centrioles, Spindle fibres and Chromatin
  - Centrosome, Nucleosome and Centrioles
39. The solid linear cytoskeleton elements having a diameter of 6 nm and made up of a single type of monomer are known as: [OS] (2014)
- Lamins
  - Microtubules
  - Microfilaments
  - Intermediate filaments
40. Match the following and select the correct answer: (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-iv B-iii C-i D-ii
- A-iv B-ii C-i D-iii
- A-i B-ii C-iv D-iii
- A-i B-iii C-ii D-iv

### Nucleus and Microbodies

41. Match List-I with List-II. (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.

- A-i B-ii C-iii D-iv
  - A-iii B-i C-iv D-ii
  - A-i B-iii C-ii D-iv
  - A-ii B-iii C-iv D-i
42. Which of the following is an incorrect statement? (2021)
- Microbodies are present both in plant and animal cells.
  - The perinuclear space forms a barrier between the materials present inside the nucleus and that of the cytoplasm.
  - Nuclear pores act as passages for proteins and RNA molecules in both directions between nucleus and cytoplasm.
  - Mature sieve tube elements possess a conspicuous nucleus and usual cytoplasmic organelles.
43. Match List-I with List-II (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

Choose the correct answer from the options given below.

- A-i B-iv C-iii D-ii
  - A-iii B-iv C-i D-ii
  - A-ii B-iii C-iv D-i
  - A-iv B-iii C-ii D-i
44. When the centromere is situated in the middle of two equal arms of chromosomes, the chromosome is referred as: (2021)
- Telocentric
  - Sub-metacentric
  - Acrocentric
  - Metacentric
45. The biosynthesis of ribosomal RNA occurs in: (2020-Covid)
- Golgi apparatus
  - Microbodies
  - Nucleolus
  - Ribosomes

46. The shorter and longer arms of a submetacentric chromosome are referred to as [OS] (2019)

- s-arm and l-arm respectively
- p-arm and q-arm respectively
- q-arm and p-arm respectively
- m-arm and n-arm respectively

47. Which of the following is true for nucleolus? (2018)

- Larger nucleoli are present in dividing cells.
- It is a membrane-bound structure.
- It takes part in spindle formation.
- It is a site for active ribosomal RNA synthesis

48. The chromosomes in which centromere are situated close to one end are: (2015)

- Telocentric
- Sub-metacentric
- Metacentric
- Acrocentric

49. Nuclear envelope is a derivative of: (2015)

- Microtubules
- Rough endoplasmic reticulum
- Smooth endoplasmic reticulum
- Membrane of Golgi complex

50. Balbiani rings are sites of:

[OS] (2015 Re)

- Nucleotide synthesis
- Polysaccharide synthesis
- RNA and protein synthesis
- Lipid synthesis

51. Match the columns and identify the correct option. (2015 Re)

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-(iii) B-(iv) C-(i) D-(ii)
- A-(iii) B-(i) C-(iv) D-(ii)
- A-(iii) B-(iv) C-(ii) D-(i)
- A-(iv) B-(iii) C-(i) D-(ii)

## Answer Key

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