Solutions

S1. Ans.(d)

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

S2. Ans.(a)

The DNA present in chloroplast is circular double stranded.

S3. Ans.(c)

• Axoneme is seen in cilia and flagella

• Centriole shows cartwheel appearance

• Crista is found in mitochondria

• Satellite is present in chromosomes

S4. Ans.(b)

Both mitochondria and chloroplasts are double membrane bound cell organelles.

Transport of ions occurs across the inner membrane of mitochondria. The inner membrane of chloroplast is impermeable to ions and metabolites. Therefore, it is said that inner membrane of mitochondria is relatively more permeable to that of chloroplast.

S5. Ans.(d)

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

S6. Ans.(a)

The endomembrane system in a cell includes: The nuclear envelope, The endoplasmic reticulum (ER), The Golgi apparatus (Golgi complex), Lysosomes, Vesicles, The plasma membrane

S7. Ans.(b)

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

S8. Ans.(c)

Option C: Both Statement I and Statement II are correct

S9. Ans.(b)

A critical role in the processing and packaging of proteins and lipids following their synthesis in the endoplasmic reticulum. It also has a role in the formation of glycoproteins and glycolipids.

(A) and (C) only.

S10. Ans.(c)

Porins are huge pores in outer membrane of mitochondria. Leg haemoglobin turns the nodules pink in colour

H+ accumulation in lumen of thylakoid occurs during photosynthetic electron transport.

Respiration is an amphibolic pathway.

S11. Ans.(d)

Genetic material of Bacteriophage x 174 contains 5386 nucleotides

Bacteriophage lambda contains 48502 base pairs

Escherichia coli contains 4.6×10^9 base pairs

Haploid content of human DNA contains 3.3×10^9 base pairs

S12. Ans.(c)

Substances that have a hydrophilic moiety find it difficult to pass through the plasma membrane; thus, their movement has to be facilitated.

S13. Ans.(c)

Lysosomes contain hydrolytic enzymes which become active at acidic pH.

If pH in lysosomes is increased to alkaline or basic then hydrolytic enzymes will become inactive.

S14. Ans.(c)

In prokaryotes, ER is absent be it RER or SER.

S15. Ans.(d)

Mature sieve tube elements do not have nucleus but have cytoplasm. (Anucleated living cells).

S16. Ans.(b)

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

S17. Ans.(d)

I.	Telocentric	Centromere placement very close to the top, p arms barely visible if visible at all.
II.	Acrocentric	q arms are still much longer than the p arms, but the p arms are longer than those in telocentric.
III.	Submetacentric	p and q arms are very close in length but not equal.
IV.	Metacentric	p and q arms are equal in length.

S18. Ans.(a)

Endomembrane system includes the endoplasmic reticulum (ER), Golgi apparatus, and lysosomes. Vesicles also allow the exchange of membrane

S19. Ans.(a)

In prokaryotic cells, reserve material is stored in the cytoplasm as inclusion bodies. These are unbound by any membrane system and are found floating around in the cytoplasm.

Food particle ingestion is aided by lysosomes.

S20. Ans.(b)

The production of glycoproteins and glycolipids takes place in the Golgi bodies.

S21. Ans.(c)

Nucleolus is a location where active ribosomal RNA synthesis takes place. In cells that are actively synthesising proteins, nucleoli are larger and more numerous.

S22. Ans.(a)

In prokaryotic cells, reserve material is stored in the cytoplasm as inclusion bodies. Phosphate granules, cyanophycean granules, and glycogen granules, for example, are not bound by any membrane system and lie free in the cytoplasm. Blue green, purple, and green photosynthetic bacteria have gas vacuoles.

S23. Ans.(d)

The smooth endoplasmic reticulum (SER) is the primary location for lipid production. SER produces lipid-like steroidal hormones in animal cells.

RER is found in a lot of cells that are involved in protein synthesis and secretion. They are long and contignous with the nucleus's outer membrane.

The Golgi apparatus is a key site for the production of glycoproteins and

glycolipids. During cell division in animal cells, the centrioles create the basal body of cilia or flagella, as well as spindle fibres that give rise to the spindle apparatus.

S24. Ans.(c)

Bacteria, blue-green algae, mycoplasma, and PPLO are examples of prokaryotic cells (Pleuro Pneumonia Like Organisms). PPLO has a diameter of 0.1 μm.

S25. Ans.(b)

The 'p' arm (p = petite, i.e. short) and the 'q' arm (q = long) of the chromosome are the shorter and longer arms, respectively.

S26. Ans.(d)

Lysosomes bud off from transface to Golgi bodies Precursor of lysosomal enzymes are synthesized by RER and then send to Golgi bodies for further processing. So, the not correct answer is Lysosomes are formed by the process of packaging in the endoplasmic reticulum.

S27. Ans.(a)

Rudolf Virchow was the first to introduce the concept of "Omnis cellula-e cellula" in relation to cell theory.

S28. Ans.(b)

Electron transport enzymes are situated in the inner membrane of mitochondria.

S29. Ans.(a)

Saccharomyces is a yeast genus.

S30. Ans.(d)

In the nucleus of a cell, the nucleolus is a tiny compact spherical structure. Ribosome biosynthesis takes place here.

S31. Ans.(b)

The Golgi complex (apparatus), like the ER, is a packaging organelle. It concentrates and packs proteins and lipids from the ER into secretory vesicles after modifying them.

S32. Ans.(d)

Phospholipid production occurs in the cystosol close to the ER membrane.

Phospholipids are made in the smooth endoplasmic reticulum from phosphatidic acid and 1, 2 diacylglycerol.

S33. Ans.(a)

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

S34. Ans.(d)

Polytene chromosomes are present in salivary glands of Dipteran larvae, according to NCERT

S35. Ans.(d)

Mitochondria is where carbohydrates are aerobically oxidised to produce ATP.

S36. Ans.(d)

The glycocalyx or slime layer is responsible for the bacterial wall's stickiness. Glycoproteins abound in this stratum.

S37. Ans.(b)

The nucleus, ribosomes, endoplasmic reticulum, golgi apparatus, secretory vesicles, and plasma membrane are the correct order of cell organelles involved in protein secretion.

S38. Ans.(c)

Materials from the RER that will be packaged as vesicles fuse with the cis face of the Golgi apparatus and migrate towards the developing face before being released from the trans face.

S39. Ans.(d)

70S ribosomes are found in mitochondria, chloroplasts, and bacterial ribosomes.

S40. Ans.(b)

NCERT (XI) Ch - 8, Pg. 129 In prokaryotic cells, reserve material is stored in the cytoplasm as inclusion bodies.

S41. Ans.(c)

In the cytoplasm, a polyribosome or polysome is formed when many ribosomes connect to a single strand of mRNA.

S42. Ans.(c)

Almost all types of hydrolytic enzymes (hydrolases – lipases, proteases, carbohydrases) were discovered to be abundant in the isolated lysosomal vesicles, which are best active at acidic pH.

S43. Ans.(d)

The pili are tubular elongated structures formed of a unique protein. Fimbriae are small bristle-like threads that emerge from the cell's surface. They are known to aid in the attachment of bacteria to rocks in streams

as well as host tissues in some bacteria, but they do not play a role in motility.

Plant cells have cell walls, plastids, and a big central vacuole, which are lacking in animal cells.

S44. Ans.(d)

Plant cells have cell walls, plastids, and a large central vacuole, which are absent in animal cells. Animal cells, on the other hand, have centrioles, which are lacking in practically all plant cells.

S45. Ans.(b)

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

S46. Ans.(b)

Spindle fibres adhere to the chromosome's kinetochore.

S47. Ans.(c)

Mitochondria and chloroplast are semi-autonomous organelles that include single circular DNA, a few RNA molecules, ribosomes (70S), and other proteins- synthesis-related components.

S48. Ans.(b)

In prokaryotic cells, reserve material is retained in the cytoplasm as inclusion bodies, such as phosphate granules, glycogen granules, and cyanophycean granules.

S49. Ans.(d)

The centromere is located in acrocentric chromosomes. At its ends, forming one extremely short and one extremely long arm.

S50. Ans.(d)

RER stands for protein synthesis.

SER stands for lipid and steroidal hormone synthesis.

S51. Ans.(d)

The stroma contains a number of thylakoids, which are flattened membrane sacs that are organised.

Thylakoids are stacked in grana, which are stacks of coins.

The nucleus is a double membrane bound organelle.

S52. Ans.(b)

Its outer membrane is normally contiguous with the ribosome-bearing endoplasmic reticulum. Except for ribosomes, the nucleus, chloroplast, and mitochondria all carry DNA.

S53. Ans.(d)

Ribosomes are made up of ribonucleic acid (RNA) and proteins and do not have a membrane surrounding them.

S54. Ans.(a)

The stroma of chloroplasts contains a number of organised flattened membrane sacs called thylakoids.

The cristae form a series of infoldings in the inner mitochondrial membrane as it moves towards the matrix. Golgi bodies are made up of multiple flat, disc-shaped sacs or cisternae that are stacked parallel to one other and range in diameter from 0.5 to 1.0 m.

S55. Ans.(c)

Ribosomes are the granular structures first observed by George Palade. They are not encased in any kind of membrane.

S56. Ans.(c)

Polytene chromosomes were discovered for the first time in the salivary gland of Chironomus tantans. They have puff or balbiani rings that create lateral loops where DNA becomes active and copies of RNA are produced.

S57. Ans.(d)

Other membrane expansions into the cytoplasm of some prokaryotes, such as cyanobacteria, are called chromatophores, and they carry photosynthetic pigments.

S58. Ans.(a)

Fimbriae are small bristle-like fibres that emerge from the cell's surface. They are known to aid in the bacteria's adhesion to rocks in streams as well as host tissues.

S59. Ans.(d)

Membrane-bound organelles do not exist in prokaryotic cells.

They don't have a nucleus that is attached to the membrane.

S60. Ans.(a)

Ribosomes are granular formations that are primarily made up of RNA and proteins. They are not encased in any kind of membrane.

S61. Ans.(c)

Flagella helps with motility. Pili and fimbriae are not involved in motility.

S62. Ans.(c)

Microfilament is a single monomer with a diameter of 5-7 nm.

S63. Ans.(c)

Osmoregulation is the purpose of vacuoles.

S64. Ans.(a)

In prokaryotes, similar to mitochondria, the mesosome aids in respiration.

S65. Ans.(b)

On flagella, the centriole is the basal body cilia.

Infoldings in mitochondria - Chlorophyll – Thylakoid Cristae Nucleic acid ribozymes

SER: Ribosome absent, engaged in lipid synthesis

S66. Ans.(a)

SER: Ribosome absent, involved in lipid synthesis

RER: Ribosomes are present and play a role in protein synthesis.

S67. Ans.(c)

SER is the location of lipid production.

S68. Ans.(a)

Plays a key function in protein post-translational modification and lipid glycosidation. It's also useful for packaging.