



Cell - The Unit of Life Important Questions With Answers

NEET Biology 2023

1. Select the correct statement from the following regarding cell membrane
- a) Lipids are arranged in a bilayer with polar heads towards the inner part
 - b) Fluid mosaic model of cell membrane was proposed by Singer and Nicolson**
 - c) Na⁺ And K⁺ Ions move across cell membrane by passive transport
 - d) Proteins make up 60 to 70% of the cell membrane

Solution : -

The lipids are arranged with the polar head towards the outer side and the non-polar tails towards the inner sides. The transport of Na⁺ And K⁺ ions is an active transport. The proteins make up 50 to 60% of the cell membrane.

2. Ribosomes are produced in _____ .
- a) Nucleolus** b) Cytoplasm c) Mitochondria d) Golgibody

Solution : -

Ribosomes are produced in nucleolous while golgi bodies take part in elaboration and secretion of complex biochemicals. Mitochondria are the site of ATP synthesis.

3. Which one is an organelle within an organelle?
- a) ER b) Mesosome c) Peroxisome **d) Ribosome**

Solution : -

Within the cell, ribosomes are found not only in the cytoplasm but also within the two organelles - chloroplasts (in plants) and mitochondria and on rough ER.

4. Select the wrong statement with respect to the structure of a plant cell:
- a) Cellulosic cell wall is present inside the cell membrane.** b) Centrioles are usually absent
 - c) A large central vacuole is present
 - d) Golgi apparatus is formed of a number of unconnected units called dictyosomes

Solution : -

Cell wall is the outer rigid protective and supportive covering of plant cells, fungi and some protists. Cell membrane is covering of protoplasm which occurs inside the cell wall.

5. In fluid mosaic model of plasma membrane _____ .
- a) Upper layer is non-polar and hydrophilic. b) Upper layer is polar and hydrophobic.
 - c) Phospholipids form a bimolecular layer in middle part.** d) Proteins form a middle layer.

Solution : -

Fluid mosaic model of plasma membrane proposes that plasma membrane compromises of a phospholipid bilayer wherein icebergs of proteins float in the sea of phospholipids.

6. The structure that help some bacteria to attach to rocks and for host tissues are :
- a) Holdfast b) Rhizoids **c) Fimbriae** d) Mesosomes

Solution : -

Fact.

7. Middle lamella is composed of :

- a) **Calcium pectate** b) Calcium pectates c) Muramic acid d) Hemicellulose

Solution : -

The middle lamella is a layer mainly of calcium pectate which holds or glues the different neighbouring cells together.

8. The eukaryotic genome differs from the prokaryotic genome because _____ .

- a) DNA is complexed with histones in prokaryotes **b) Repetitive sequences are present in eukaryotes**
c) Genes in the former cases are organised into operons
d) DNA is circular and single stranded in prokaryotes

Solution : -

A major component (20-50%) of the eukaryotic genome consists of DNA which does not code for any protein. This portion consists of certain base sequences which are repeated many times (hence, called repetitive DNA). DNA of prokaryotes does not contain histones nor it is single stranded.

9. Flagella of prokaryotic and eukaryotic cells differ in _____ .

- a) Type of movement and placement in cell b) Location in cell and mode of functioning
c) Microtubular organisation and type of movement. d) Microtubular organisation and function.

Solution : -

The thylakoid membranes possess the chlorophylls. The outer membrane is permeable to a number of solutes. Inner membrane has several carrier proteins. Stroma forms the matrix containing the enzyme for Calvin cycle.

10. Assertion: Rudolf Virchow modified the hypothesis of cell theory given by Schleiden and Schwann.

Reason: Cell theory says that all cells arise from pre-existing cells.

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false.

11. A major break through in the studies of cells came with the development of electron microscope. This is because _____ .

a)

The resolving power of the electron microscope is 200-350 nm as compared to 0.1-0.2 for the light microscope.

b) Electron beam can pass through thick materials, whereas light microscopy requires thin sections.

c)

The electron microscope is more powerful than the light microscope as it uses a beam of electrons which has wavelength much longer than that of photons.

d) The resolution power of the electron microscope is much higher than that of the light microscope.

Solution : -

With the development of EM having great resolution power, a major break through in cell studies came. Due to which we can see the ultrastructures of cell organelles.

12. Which one of these statements is incorrect?

- a) Glycolysis operates as long as it is supplied with NAD that can pick up hydrogen atoms.
b) Glycolysis occurs in cytosol. c) Enzymes of TCA cycle are present in mitochondrial matrix.
d) Oxidative phosphorylation takes place in outer mitochondrial membrane.

Solution : -

Oxidative phosphorylation is process of ATP formation which occurs in inner mitochondrial membrane. During this process electrons are transferred to oxygen molecule from NADH or FADH through a series of electron carries in ETS.

13. Which of the following is enveloped by a nuclear membrane?



14. The molecules in the membrane that limit its permeability are the
 a) carbohydrates **b) phospholipids** c) proteins d) water.

Solution : -

The lipid bilayer comprising mostly of phospholipid that limits the permeability of the membrane

15. Which is the best way to separate intact chloroplast from green leaves of angiospermic plant?
 a) Petrol-ether b) Chloroform c) 10% sucrose solution **d) Alcohol**
16. Fluid mosaic model of cell membrane was put forward by _____ .
 a) Danielli and Davson **b) Singer and Nicolson** c) Gamer and Allard d) Watson and Crick

Solution : -

Fluid mosaic model of plasma membrane was proposed by SJ Singer and GL Nicolson (1972).

17. The figures of cork cells as seen by Robert Hooke were published in the book
 a) Origin of species b) Species plantarum c) Genera plantarum **d) Micrographia.**
18. Match column I with column II and select the correct option from the codes given below.

	Column I		Column II
A.	Chloroplasts	(i)	Colourless plastids
B.	Chromoplasts	(ii)	Yellow, Orange or red coloured plastids
C.	Leucoplasts	(iii)	Green plastids

- a) A-(iii), B-(i), C-(ii) **b) A-(iii), B-(ii), C-(i)** c) A-(i), B-(iii), C-(ii) d) A-(i). B-(ii), C-(iii)
19. The function of glyoxysome is
 a) protein metabolism b) carbohydrate metabolism **c) fat metabolism** d) protein synthesis

Solution : -

Glyoxysomes are microbodies which contain enzymes for β -oxidation of fatty acids and glyoxylate pathway. They are considered to be special peroxisomes. They occur abundantly in germinating endosperm cells of oil seeds.

20. Which one of the following does not differ in E.coli and Chlatnydomonasl.
 a) Ribosomes b) Chromosomal organization c) Cell wall **d) Cell membrane**

Solution : -

Cell membrane of both prokaryotes and eukaryotes are structurally similar. So, there is no difference in cell membrane in E. Coli and Chlamydomonas.

21. The core of a cilium or flagellum composed of microtubules and their associated proteins is called
 a) blepharoplast **b) axoneme** c) microfilament d) tubulin

Solution : -

The core of a cilium or flagellum composed of microtubules and their associated proteins is called axoneme.

22. Which of the following is true for nucleolus?
 a) It takes part in spindle formation b) It is a membrane-bound structure
 c) Larger nucleoli are present in dividing cells **d) It is a site for active ribosomal RNA synthesis**

Solution : -

Nucleous is a non-membranous structure and is a site of r-RNA synthesis.

23. What is true about ribosomes?

- a) The prokaryotic ribosomes are 80S, where "S" stands for sedimentation coefficient.
b) **These are composed of ribonucleic acid and proteins.** c) These are found only in eukaryotic cells.
d) These are self-splicing introns of some RNAs.

Solution : -

Ribosomes are composed of ribonucleic acid and protein. They are non-membranous structure. which are necessary for protein synthesis. In prokaryotes, 70S type of ribosomes are found and in Eukaryotes 80S type of ribosomes are present.

24. Who proposed a modification in the cell theory?

- a) Schleiden and Schwann b) **Rudolf Virchow** c) Robert Hooke d) Marcello Malpighi

Solution : -

Rudolf Virchow modified the cell theory and gave the concept of 'omnis cellula-e cellula' - means new cells develop by division of the pre-existing cells. This is called theory of cell lineage or common ancestry.

25. Assertion : The endomembrane system includes endoplasmic reticulum (ER), Golgi complex, lysosomes and vacuoles

Reason : Mitochondria, chloroplast and peroxisomes are not the part of endomembrane system because their functions are not coordinated with the same

- a) If both assertion and reason are true and reason is the correct explanation of assertion
b) **If both assertion and reason are true but reason is not the correct explanation of assertion.**
c) If assertion is true but reason is false. d) If both assertion and reason are false.

Solution : -

Endomembrane system is a grouping of some membrane organelles which function in close coordination with one another, viz., endoplasmic reticulum, Golgi complex, lysosomes and vacuoles. Functions of other organelles are not coordinated. They are not part of endomembrane system, e.g., chloroplasts, mitochondria, peroxisomes and glyoxysomes etc

26. Which organelle helps in the synthesis of lipids, cholesterol, steroids and visual pigments in epithelial cells of retina?

- a) Golgi bodies b) RER c) **SER** d) Mitochondria

Solution : -

The SER provides surface for the synthesis of lipids, including phospholipids, cholesterol, steroid hormones (sex hormones, adrenal corticoid hormones), ascorbic acid and visual pigments.

27. The Golgi complex participates in :

- a) Respiration in bacteria b) Formation of secretory vesicles c) Fatty acid breakdown
d) **Activation of amino acid**

Solution : -

The Golgi apparatus receives proteins and lipids from the ER. It modifies them, concentrates and packs them into secretory vesicles that are formed by budding off from the trans-Golgi surface.

28. Extranuclear inheritance is due to the presence of genes in

- a) **mitochondria and chloroplasts** b) nucleus and mitochondria c) nucleus and chloroplasts
d) endoplasmic reticulum and mitochondria

Solution : -

Chloroplasts and mitochondria are semi-autonomous cell-organelles possessing their own DNA and proteins. In animals an individual gets mitochondria and mitochondrial genes from its mother because the middle piece of a sperm that contains mitochondria does not enter the egg during fertilisation. This inheritance pattern of mitochondrial genes is called uniparental inheritance or extra nuclear inheritance or maternal inheritance.

29. Select the incorrect match:

- a) **Submetacentric Lshaped --Chromosomes chromosomes** b) Allosomes-- Sex chromosomes
 c) Lampbrush --Diplotene bivalents d) Polytene-- Oocytes of amphibians Chromosomes

Solution : -

Polytene chromosomes are found in salivary glands of insects and are also called as salivary chromosomes.

30. The fluid mosaic model explains which aspects of a cell membrane?

- a) Only structural aspects b) Only functional aspects **c) Both structural and functional aspects**
 d) Only fluidity of membrane

Solution : -

The fluid mosaic model explains both structural and functional aspects of cell membrane. It can explain the presence of different types of permeability and retentivity of various cell membranes. The model explains the passage of both electrolytes and non-electrolytes through the biomembranes. Because of the structural peculiarities of the membrane surfaces, the cells can show various types of interactions including recognition, attachment, antigen, information receptors, etc.

31. The function of rough endoplasmic reticulum is _____ .

- a) Fat synthesis b) Lipid synthesis **c) Protein synthesis** d) Steroid synthesis

Solution : -

Rough Endoplasmic Reticulum (RER) provides surface for ribosomes for synthesis of secretory (serum proteins), lysosomal and membrane proteins, glycoproteins and helps in packaging of polypeptide chains into enzymes/proteins. It also provides membrane to Golgi bodies for forming vesicles and lysosomes.

32. Microtubules are constituents of:

- a) Centrosome, nucleosome and centrioles b) Cilia, flagella and peroxisomes
c) Spindle fibres, centrioles and cilia d) Centrioles, spindle fibres and chromatin

Solution : -

Microtubules are constituents of cilia, Flagella, centralis and Spindle fibres. They are also the part of fibres found in cytoskeleton.

33. Match the cell organelles given in column I with cellular processes in column II and select the correct option from the codes given below

Column I		Column II
A Lysosomes	(i)	Protein synthesis
B Ribosomes	(ii)	Hydrolytic activity
C Smooth endoplasmic	(iii)	Steroid synthesis
D Centriole	(iv)	Formation of spindle

- a)

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

 b)

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

 c)

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

 d)

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

34. Identify the cells whose secretion protects the lining of gastro-intestinal tract from various enzymes.

- a) Goblet Cells** b) Oxyntic Cells c) Duodenal Cells d) Chief Cells

Solution : -

Goblet cells secrete mucus and bicarbonates present in the gastric juice which plays an important role in lubrication and protection of the mucosal epithelium from excoriation by the highly concentrated HCl.

35. Which one of the following is not an inclusion body found in prokaryotes?

- a) Polysome** b) Phosphate granule c) Cyanophycean granule d) Glycogen granule

Solution : -

Polysomes are not inclusion bodies. Polysomes or polyribosomes are a cluster of ribosomes.

36. Ribosomes of the cytoplasm, chloroplast and mitochondrion are respectively

a) 80S, 80S and 70S **b) 80S, 70S and 70S** c) 70S in all d) 80S in all

37. Match column I with column II and select the correct option from the codes given below.

	Column I		Column II
A.	RER	(i)	Intracellular and extracellular digestion
B.	SER	(ii)	Lipid Synthesis
C.	Golgi complex	(iii)	Protein synthesis and secretion
D.	Lysosomes	(iv)	Moves materials out of the cell

a) A-(iii), B-(ii), C-(iv), D-(i) b) A-(ii), B-(iii), C-(iv), D-(i) c) A-(i), B-(iii), C-(ii), D-(iv)
d) A-(iv), B-(ii), C-(iii), D-(i)

38. Which one of the following events does not occur in rough endoplasmic reticulum?

a) Cleavage of signal peptide b) Protein glycosylation c) Protein folding **d) Phospholipid synthesis**

Solution : -

Phospholipid synthesis does not occur in RER. It takes place in SER. RER synthesizes protein. It contains enzymes for modifying polypeptides synthesized by attached ribosomes i.e. glycosylation.

39. Angstrom (A°) is equal to _____ .

a) 0.01 mm b) 0.001 mm **c) 0.0001 mm** d) 0.00001 mm

Solution : -

Angstrom (A°) = 0.0001 mm

$1\text{A}^\circ = 10^{-10}\text{M} = 10^{-8}\text{cm} = 10^{-7}\text{mm} = 10^{-4}\mu$.

40. Which of the following statements regarding sphaerosomes is not correct?

a) Abundant in the endosperm cells of oil seeds b) Bounded by a single membrane
c) Take part in synthesis and storage of lipids **d) Take part in photorespiration**

Solution : -

Sphaerosomes are small cell organelles bounded by single membrane which take part in storage and synthesis of lipids. Sphaerosomes occur abundantly in the endosperm cells of oil seeds. Chloroplast, peroxisome and mitochondria take part in photorespiration.

41. Select the option which arranges the following steps in a correct sequence as per Gram's staining technique: Treatment with 0.5% iodine solution (1), washing with water (2), treatment with absolute alcohol/acetone (3), staining with weak alkaline solution of crystal violet (4).

a) 4→1→2→3 b) 3→2→1→4 c) 3 → 1 → 2 → 4 d) 4 → 2 → 3 → 1

Solution : -

Bacteria can be classified into two groups based upon reaction of bacteria to Gram's stain (Christian Gram, 1884). Bacteria are first stained with weakly alkaline solution of crystal violet and then treated with 0.5% iodine solution. This is followed by washing with water and then with alcohol or acetone. Bacteria which retain blue or purple colour are known as Gram (+ve) bacteria (e.g., Bacillus subtilis). Bacteria which do not retain stain and become colourless are called Gram (-ve) bacteria (e.g., Escherichia coli). Washing of the stain in Gram (-ve) bacteria is due to high lipid content of their cell wall which gets dissolved in organic solvents like acetone.

42. Bright colour of petals is due to the presence of

a) chloroplast **b) anthocyanin** c) elaioplast d) amyloplast.

Solution : -

Anthocyanins are one of the groups of flavanoid pigments. They occur in the cell vacuoles of various plant organs and are responsible for many of the blue, red and purple colours in plants (particularly in flowers).

43. The prokaryotic flagella possess _____ .

a) Unit membrane enclosed fibre b) Protein membrane enclosed fibre
c) '9+2' membrane enclosed structure **d) Helically arranged protein molecule**

Solution : -

Prokaryotic (bacterial) flagellum is made up of flagellin protein arranged helically. It do not show 9+2 organisation and ATPase activity. These flagella do not beat but rotate like a propellar that brings about backward pushing of water. Gram +ve bacteria having two rings in the basal body. Gram -ve bacteria have four rings. The L, P, M and S rings.

44. Cell organelles having hydrolases/digestive enzymes are _____ .
a) Peroxisomes b) Lysosomes c) Ribosomes **d) Mesosomes**

Solution : -

Lysosomes (or suicidal bags or cellular house keepers or scavenger of cell) are single membrane bound, spherical microbodies, filled with different types of acid hydrolases (digestive enzymes) working at pH<5 and can digest almost every type of organic matter except cellulose. Primary lysosome (storage granules) unites with food vacuole (phagosome) forming secondary lysosomes (heterophagosomes or digestive vacuoles) which cause intracellular digestion (heterophagy).

45. All plastids have similar structure because they can _____ .
a) Store starch, lipids and proteins **b) Get transformed from one type to another**
c) Perform same function d) Be present together

Solution : -

All plastids are similar in structure because these are interconvertible and get transformed from one type to another. Leucoplasts are formed from proplastids and leucoplasts; chloroplasts can arise from pre-existing chloroplasts, proplastids and leucoplasts and chromoplasts can develop from proplastids, leucoplasts and chloroplasts.

46. Which of the following cell organelles is responsible for extracting energy from carbohydrates to form ATP?
a) Lysosome b) Ribosome c) Chloroplast d) Mitochondrion

Solution : -

Mitochondria are the site of aerobic oxidation of carbohydrates to generation ATP.

47. Binding of specific protein on regulatory DNA sequence can be studied by means of _____ .
a) Ultra centrifugation b) Electron microscope c) Light microscope **d) X-rays crystallography**

Solution : -

X-ray crystallography is an important technique in molecular biology to analyse the structure and orientation of molecules. It is used to find out 3-D positions of atoms in the molecules of DNA, RNA and proteins, binding of specific protein on regulatory DNA sequences, 3-D structure of haemoglobin, insulin, DNA, proteins, collagen fibre, muscle and actin protein.

48. Which one of these is not a eukaryote?
a) Euglena **b) Anabaena** c) Spirogyra d) Agaricus

Solution : -

Anabaena is a cyanobacterium. Cyanobacteria are prokaryotes

49. Prokaryotic cells are generally ___ and multiply ___ than the eukaryotic cells.
a) smaller, slower b) larger, slower **c) smaller, faster** d) larger, faster

Solution : -

Prokaryotic cell is usually small (0.1 - 5.0 μm) in size whereas eukaryotic cell size is comparatively larger (5-100 μm). Prokaryotic cells multiply very rapidly by asexual means like binary fission, sporulation etc.

50. Which of the following options is correct about structures visible in the cross-section of a centriole?

a)

Peripheral Central microtubules (triplets)	Central microtubules (singlets)	Hub	Spoke	triplet bridge
9	2	1	9	9

b)

Peripheral Central microtubules (triplets)	Central microtubules (singlets)	Hub	Spoke	triplet bridge
9	2	9	9	9

c)

Peripheral Central microtubules (triplets)	Central microtubules (singlets)	Hub	Spoke	triplet bridge
9	2	1	2	2

d)

Peripheral Central microtubules (triplets)	Central microtubules (singlets)	Hub	Spoke	triplet bridge
9	0	1	9	9

Solution : -

A centriole possesses a whorl of nine peripheral fibrils. Fibrils are absent in the centre. The arrangement is, therefore, called 9 + 0 which run parallel to one another but at an angle of 40°. Each fibril is made up of three subfibrils called triplet fibril. The three sub-fibrils are in reality microtubules joined together by their margins and, therefore, sharing the common walls made of 2-3 protofilaments. The centre of centriole possesses a rod-shaped proteinaceous mass known as hub. The hub has a diameter of 2.5 nm. From the hub, develops 9 proteinaceous strands towards the peripheral triplet fibrils called radial fibres or spokes.

