

CORE-IV (CELL BIOLOGY)

I. Answer the following questions [1]

1. The term cell was given by

1. Robert Hooke
2. Tatum
3. Schwann
4. De Bary

2. The cell is not applied for

1. Algae
2. Bacteria
3. Virus
4. Fungi

3. The membrane around the vacuole is known as

1. Tonoplast
2. Elaioplast
3. Cytoplast
4. Amyloplast

4. Microfilaments are composed of a protein called

1. Tubulin
2. Actin
3. Myosin
4. Chitin

5. A plant cell wall is mainly composed of

1. Protein
2. Cellulose
3. Lipid
4. Starch

6. Glycolipids in the plasma membrane are located at

1. Inner leaflet of the plasma membrane
2. The outer leaflet of the plasma membrane
3. Evenly distributed in the inner and outer leaflets
4. It varies according to cell types

7. Lysosomes are known as “suicidal bags” because

1. Parasitic activity
2. Presence of food vacuole
3. Hydrolytic activity
4. Catalytic activity

8. The properties of integral membrane proteins can be studied by

1. Atomic force microscopy
2. Cryo-sectioning and electron microscopy
3. Freeze-fracture technique and electron microscopy
4. All of the above

9. The fluidity of the plasma membrane increases with

1. Increase in unsaturated fatty acids in the membrane
2. Increase in saturated fatty acids in the membrane
3. Increase in glycolipid content in the membrane
4. Increase in phospholipid content in the membrane

10. Which among the following defines GPI anchored proteins?

1. Integral proteins of the plasma membrane
2. Peripheral proteins of the plasma membrane
3. Proteins that bind to ion-gated channels in the plasma membrane
4. Proteins which randomly bind to lipids of the plasma membrane

11. The resting potential membrane is determined by

1. Potassium-ion gradient
2. Sodium-ion gradient
3. Bicarbonate-ion gradient
4. None

12. The oxygen and carbon dioxide crosses the plasma membrane by the process of

1. Active diffusion
2. Facilitated diffusion
3. Passive diffusion
4. Random diffusion

13. A cell without a cell wall is termed as

1. Tonoplast

2. Protoplast
3. Symplast
4. Apoplast

14. Which is not an example of transmembrane transport between different subcellular compartments?

1. Transport from the stroma into thylakoid space
2. Transport from the cytoplasm into the lumen of the endoplasmic reticulum
3. Transport from the endoplasmic reticulum into the Golgi complex
4. Transport from mitochondrial intermembrane space into the mitochondrial matrix

15. Which is correct regarding the peptides in the Ramachandran Plot?

1. The sequence of the peptide can be deduced
2. It is not possible to conclude whether a peptide adopts entirely helix or entirely beta-sheet conformation
3. Peptides that are unstructured will have all the backbone dihedral angles in the disallowed regions
4. The occurrence of a beta-turn conformation in a peptide can be deduced.

16. The function of the centrosome is

1. Formation of spindle fibres
2. Osmoregulation
3. Secretion
4. Protein synthesis

17. Which cell organelle is involved in apoptosis?

1. Lysosome
2. ER
3. Golgi
4. Mitochondria

18. Phosphatidylserine residues in the plasma membrane are located at

1. Inner leaflet of the plasma membrane
2. The outer leaflet of the plasma membrane
3. Evenly distributed in the inner and outer leaflet
4. None

19. Distribution of intrinsic proteins in the plasma membrane is

1. Random
2. Symmetrical
3. Asymmetrical

4. None

20. Select a foodborne toxin

1. Botulinum toxin
2. Tetanus Toxin
3. Diphtheria toxin
4. Cholera Toxin

Answer Key

1- 1	2- 3	3- 1	4- 2	5- 2
6- 2	7- 3	8- 3	9- 1	10- 2
11- 1	12- 3	13- 2	14- 3	15- 4
16- 1	17- 4	18- 1	19- 3	20- 1

II. Answer the following questions within 2-3 sentences. [1.5]

- 1) What are viroids?
- 2) Give the structure of virus.
- 3) What is mycoplasma also known as? Also state the disease caused by mycoplasma.
- 4) Give some diseases caused by Prions?
- 5) State about the fluid nature of plasma membrane.
- 6) What are transport proteins?
- 7) Where are tight junctions found?
- 8) What is the function of desmosomes?
- 9) What is the role of gap junctions?
- 10) What is a protofilament?
- 11) Why are intermediate filaments named so?
- 12) State about tubulin protein.
- 13) Why are lysosomes called suicidal bags of cell?
- 14) What is cis face and trans face of Golgi apparatus?
- 15) What are F_0 - F_1 particles?
- 16) What is the function of ATP synthase?
- 17) What is Nucleolar Organizing Region (NOR)?

III. Answer the following questions within 75 words. [2]

- 1) State about nuclear envelope.
- 2) What is nuclear pore complex?

- 3) Write the function of nucleolus.
- 4) Differentiate between Euchromatin and Heterochromatin.
- 5) Give the two types of heterochromatins.
- 6) What is nucleosome?
- 7) What is the role of second messenger (cAMP)?
- 8) What is the function of GPCR? Why is it called serpentine receptor?
- 9) State about semi-autonomous nature of mitochondria.
- 10) What is endosymbiotic hypothesis?
- 11) What is the function of endoplasmic reticulum?
- 12) What is the function of Golgi apparatus?
- 13) What is the function of Lysosomes?
- 14) Give the functions of microtubules.
- 15) Give the functions of microfilaments.
- 16) Give the functions of intermediate filaments.
- 17) Differentiate between prokaryotic and eukaryotic cells.
- 18) Differentiate between active and passive transport.
- 19) What is facilitated transport?
- 20) What are tight junctions also called? Also give the functions of tight junctions.

IV. Answer the following questions within 500 words. [6]

- 1) Write a short note on virus.
- 2) What are Prions? Explain.
- 3) Give the various models of plasma membrane structure.
- 4) Give a detailed account on transport across membrane.
- 5) Explain about cell junctions.
- 6) Give the structure and functions of Microtubules.
- 7) Give the structure and functions of Microfilaments.
- 8) Give the structure and functions of Intermediate filaments.
- 9) Give the structure and functions of Endoplasmic reticulum.
- 10) Give the structure and functions of Golgi apparatus.
- 11) Give the structure and functions of Lysosomes.
- 12) Give the structure of mitochondria. Also state about chemi-osmotic hypothesis.
- 13) What is mitochondrial respiratory chain?
- 14) State about peroxisomes.
- 15) Give the structure of nucleus.
- 16) Explain mitosis.
- 17) Explain meiosis.
- 18) State about cell cycle and its regulation.
- 19) Write a short note on GPCR.
- 20) State about packaging of chromosome.