2022

ZOOLOGY

(Honours)

Paper : ZOO–HC–2026

(Cell Biology)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Fill in the blanks : ***(any seven)*** 1×7=7

   (a) The undefined nuclear region of Prokaryotes are known as _____.

   (b) Lipid rafts are patches of cholesterol and _____.

   (c) Gap junction allows the exchange of _____.

   (d) _____ is also known as 'suicide bag' of a cell.

   (e) Cristae in mitochondria serves as sites for _____.

Contd.

(f) F1 particles/oxysome/elementary particles are present in _____.

(g) _____ fibre is also called actin filaments.

(h) The type of cell division in which number of chromosomes remains constant in the daughter cell is called _____.

(i) The non-dividing state of cell is called _____.

(j) Crossing over occurs in the _____ stage of meiosis I.

2. Answer ***any four*** from the following : 2×4=8

(a) Distinguish between virus and viroids.

(b) Comment on receptor mediated endocytosis.

(c) State the role of ATP in membrane transport.

(d) What is endomembrane system ?

(e) Compare the structure of lysosomes and peroxisomes.

(f) Write about the significance of chromatin remodeling.

(g) What are histones ? State the function of histone protein.

(h) How will you distinguish eukaryotes from prokaryotes ?

3. Answer ***any three*** from the following : 5×3=15

(a) Describe the structure and function of tight junction.

(b) Give an account on different types of membrane protein with its importance.

(c) Write a note on chemi-osmotic hypothesis.

(d) Explain how microfilaments helps in the process of cell division.

(e) Distinguish between heterochromatin and euchromatin.

(f) Describe the structure and function of nucleolus.

(g) Describe the importance of nucleosome in DNA packaging.

(h) Describe the molecular mechanism of cell-cycle regulation.

4. Answer ***any three*** from the following : 10×3=30

(a) Describe the structure of plasma membrane based on fluid mosaic model. What do you mean by symporter and antiporter ? Give example. 6+4=10

(b) Describe the ultrastructure, types and functions of endoplasmic reticulum. 4+1+5=10

(c) Why mitochondria is considered as powerhouse of cell ? Write a note on oxidative phosphorylation. 2+8=10

(d) Define cytoskeleton. Describe the structure and function of microtubules. 2+4+4=10

(e) Describe in detail how micromolecules transported through the plasma membrane ?

(f) Describe the structure of nuclear pore complex and discuss the mechanism involved in nucleocytoplasmic transport. 5+5=10

(g) Discuss various stages of meiosis with the help of diagram. What is its significance ? 7+3=10

(h) What are cell surface receptors ? Describe how signals are transduced through G-protein coupled receptors. 2+8=10