3 (Sem–2/CBCS) ZOO HC 2

2025

ZOOLOGY

(Honours Core)

Paper : ZOO–HC–2026

(Cell Biology)

Full Marks : 60

Time : Three hours

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

1. Choose the correct option : 1×7=7

   (i) Which of the following is not a characteristic of prokaryotes ?

   (a) Cell membrane

   (b) DNA

   (c) Cell wall

   (d) Endoplasmic reticulum

(ii) Which of the following transport induces conformational change in protein ?

(a) Active transport

(b) Simple diffusion

(c) Facilitated diffusion

(d) Ion-driven active transport

(iii) Phagocytosed food is digested with the help of enzymes which are present in

(a) Ribosomes

(b) Mitochondria

(c) Lysosome

(d) Golgi complex

(iv) All the statements are true, except

(a) Mitochondria are called as the power house of the cell

(b) Mitochondrial DNA is called mtDNA

(c) Mitochondira is the site of Calvin cycle

(d) Mitochondria is the site of Krebs cycle

(v) Viruses that attack bacteria are called

(a) Lysophage

(b) Virophage

(c) Bacteriophage

(d) None of the above

(vi) Which one of the following is the best stage to observe the shape, size and number of the chromosomes in a cell ?

(a) Prophase

(b) Interphase

(c) Metaphase

(d) Telophase

(vii) Barr body in mammals represents

(a) All the hetarochromatin in male and female cells

(b) All the hetarochromatin in female cells

(c) The *Y* chromosome in somatic cells of male

(d) One of the two *X* chromosomes in somatic cells of females

2. Answer the following questions : 2×4=8

(a) What is meant by signal transduction ?

(b) Write the characteristics of second messenger.

(c) Define oxydative phosphorylation.

(d) Distinguish between euchromatin and heterochromatin.

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

(a) Explain why the nucleus is called as the control center of the cell.

(b) Describe the different types of cell surface receptors.

(c) Justify the statement :

"Cytoskeletons are the bones and muscle of the cell."

(d) Write the significance of meiosis.

(e) Discuss the role of Golgi apparatus in exocytosis and endocytosis.

4. What are GPCRs ? Describe the role of G proteins in cell signalling. 4+6=10

Or

What is meant by reductional cell division ? Describe the various phases of prophase–I of meiosis with suitable labelled diagram. 2+6+2=10

5. What is meant by protofilaments ? Describe the structure and function of intermediate filaments with appraopriate diagrams. 2+5+3=10

Or

What is meant by beads on a string ? Describe the ultrastructure of the nucleosome. 3+7=10

6. What are the functions of plasma membranes ? Describe the properties of cell membrane essential for their function. 5+5=10

Or

Discuss the role of endoplasmic reticulum in protein synthesis and post-translational modifications. 5+5=10
