

M.Sc. 1st Semester Examination, 2024

ZOOLOGY

(Cell Biology)

PAPER – ZOOL-107

Full Marks : 25

Time : 1 hour

Answer all questions

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

GROUP – A

1. Answer any *two* of the following questions : 2 × 2
- (a) Compare uniport, symport and antiport transport mechanisms.

(Turn Over)

(2)

- (b) What are chaperones ? Explain their function in the lumen of endoplasmic reticulum (ER).
- (c) Mention the significance of the S phase in the cell cycle. What processes are involved in this phase ?
- (d) How do cyclin-dependent kinases (CDKs) regulate cell cycle progression ?

GROUP – B

2. Answer any *two* of the following questions : 4 × 2
- (a) Discuss the roles of sphingolipids and cholesterol in membrane fluidity. 2 + 2
- (b) What is a signal sequence ? Give a brief account of the role of TIM/TOM translocation of protein through mitochondrial membrane. 1 + 3

- (c) 'Signal transduction is often a multistep process' – Justify the statement. 4
- (d) Explain the role of Ran-GTases in nuclear import and export. 2 + 2

GROUP – C

3. Answer any *one* of the following questions : 8 × 1
- (a) (i) What is a FRAP (Fluorescence recovery after photobleaching) experiment? State its application. 2
- (ii) Explain the mechanism by which Na/K ATPase pump maintains intracellular Na⁺ balance. 3
- (iii) Add a brief note on the functions of Kinesin and Dynein. 3
- (b) (i) Describe the cellular level consequences of V-type proton pump inhibition by an experimental drug. 2

(4)

(ii) What are the major DNA damage checkpoints in cell cycle? 2

(iii) Elucidate briefly the working mechanism of G-protein-coupled receptors (GPCRs). 4

[Internal Assessment – 5 Marks]
