

Total No. of Printed Pages—4

**2 SEM TDC ZOOH (CBCS) C 4**

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( May )

**ZOOLOGY**

( Core )

Paper : C-4

( **Cell Biology** )

Full Marks : 53

Pass Marks : 21

Time : 3 hours

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

1. Choose the correct answer of the following :

1×5=5

(a) Which of the following is a common feature of prokaryotic and eukaryotic cells?

- (i) Nucleus
- (ii) Cell wall
- (iii) Plasma membrane
- (iv) Mitochondria

- (b) Which of the following cell organelles is involved in the synthesis of phospholipids?
- (i) Mitochondria
  - (ii) Cytoplasm
  - (iii) Endoplasmic reticulum
  - (iv) Golgi apparatus
- (c) Which of the following is involved in the formation of lysosomes, secretory vesicles and plasma membrane?
- (i) Smooth endoplasmic reticulum
  - (ii) Rough endoplasmic reticulum
  - (iii) Ribosomes
  - (iv) Golgi apparatus
- (d) Which of the following is a common feature of all G protein-coupled receptors (GPCRs)?
- (i) They all have a single transmembrane helix
  - (ii) They have seven transmembrane helices
  - (iii) They have an extracellular N-terminus and an intracellular C-terminus
  - (iv) Both (ii) and (iii)



(e) Which of the following enzymes catalyses the conversion of ATP to cAMP?

- (i) Adenylate cyclase
- (ii) Phosphodiesterase
- (iii) Guanylate cyclase
- (iv) Kinase

2. Write short notes on (any two) : 3×2=6

- (a) Cell cycle
- (b) Viroids
- (c) Chemiosmotic hypothesis
- (d) Peroxisomes

3. Compare and contrast the structure and function of tight junctions, desmosomes and gap junctions with suitable illustrations. 7

Or

Compare and contrast the three models of plasma membrane : lipid bilayer model, unit membrane model and fluid mosaic model. Use suitable illustrations. 7

4. Describe the structure and function of the endoplasmic reticulum in eukaryotic cells. What are its different types and mention their functions. 3+2+1+1=7

Or

What is lysosome? How does lysosome function inside the cells? 2+5=7

5. Describe the structure and function of mitochondria. Explain why mitochondria are considered as storehouse of energy.  $(2+2)+3=7$

Or

Describe how the electron transport chain and the proton gradient are involved in the synthesis of ATP. Discuss the features of the chemiosmotic hypothesis.  $5+2=7$

6. Explain the structure and function of cytoskeleton in eukaryotic cells.  $5+2=7$

Or

Compare and contrast the structure and function of microtubules, microfilaments and intermediate filaments. 7

7. Describe the structure and function of the nuclear envelope, nuclear pore complex and nucleolus in eukaryotic cell.  $3+3+1=7$

Or

Explain the structure and function of chromatin in eukaryotic cells. Describe the differences between euchromatin and heterochromatin.  $4+3=7$

8. Explain the stages and events of cell cycle. Describe the role of cyclins and cyclin-dependent kinases in controlling the progression of cell cycle.  $4+3=7$

Or

What are second messengers? Give examples. Describe how cAMP mediates the intracellular signalling pathways.  $1+1+5=7$

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