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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

(2)

(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 trans-membrane helix

(ii) They have seven transmembrane helices

(iii) They have an extracellular N-terminus and an intracellular C-terminus

(iv) Both (ii) and (iii)

(3)

(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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