

1 (Sem-5/FYUGP) ZLG 41 MJ

2 0 2 5

ZOOLOGY

(Major)

Paper : ZLG0500104

(Cell Biology)

Full Marks : 45

Time : 2 hours

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

1. Choose the correct answer : 1×5=5

(a) Cytoskeleton consists of

(i) microtubules

(ii) microfilaments

(iii) intermediate filaments

(iv) All of the above

(b) Gap junctions are absent in

(i) sperm cells

(ii) brain cells

(iii) heart cells

(iv) liver cells

(2)

- (c) Which of the following is the largest single membrane-bound intracellular compartment?
- (i) Ribosomes
 - (ii) Golgi complex
 - (iii) Nucleus
 - (iv) Endoplasmic reticulum
- (d) Cristae in mitochondria serves as sites for
- (i) oxidation reduction reaction
 - (ii) protein synthesis
 - (iii) macromolecules breakdown
 - (iv) flavoproteins are phosphorylated
- (e) During 'X' phase of cell division centriole divide, DNA replicate and synthesis of histone protein takes place. What is 'X'?
- (i) G0 phase
 - (ii) G1 phase
 - (iii) G2 phase
 - (iv) S phase

(3)

2. Answer any *five* from the following questions :

2×5=10

- (a) Differentiate between Viroids and Prions.
- (b) What is euchromatin?
- (c) Describe the structure of lysosome.
- (d) What is ubiquinone?
- (e) Draw the structure of polytene chromosome.
- (f) Write the important functions of microtubule.
- (g) What is cyclin-dependent kinase (CDK)?
- (h) Mention two differences between mitosis and meiosis.
- (i) Define cell signalling.
- (j) What is necrosis?

3. Answer any *four* from the following questions :

5×4=20

- (a) What are the different modes of transport that a cell has to rely on in order to function properly?
- (b) Discuss about anchoring junctions and their functions.
- (c) What is nucleosome? Describe its structure and significance.

(4)

- (d) Explain the structure and function of plasma membrane according to the fluid mosaic model.
- (e) Discuss the components of the endomembrane system.
- (f) Which hypothesis explains the origin of mitochondria?
- (g) Elucidate the different modes of chemical signaling with supporting diagram.
- (h) Discuss the role of cytoskeleton in cell shape and motility.

4. Answer any *one* from the following questions : 10

- (a) What is apoptosis? Explain the mechanism of apoptosis. 2+8=10
- (b) What is oxysome? What is mitochondrial electron transport chain (ETC)? What are the various complexes of ETC? 2+3+5=10
- (c) What are second messengers? How are IP₃ and DAG generated? Elucidate the roles of IP₃ and DAG as second messengers. 2+3+5=10
- (d) What are the various stages of meiotic prophase-I? Enumerate the chromosomal events during each stage. 3+7=10

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