2024

(NEP–2020)

(3rd Semester)

ZOOLOGY (MAJOR)

(Cell Biology)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A—OBJECTIVE)

(*Marks* : 10)

Tick (✓) the correct answer in the brackets provided : 1×10=10

1. In prokaryotes, hair-like outgrowths which attach to the surface of other bacterial cells are

   (a) flagella ( ) *(b)* pilli ( )

   (c) capsule ( ) *(d)* plasmids ( )

2. All cells arise from pre-existing cells. This tenet of cell theory was put forward by

   (a) Schwann ( ) *(b)* Virchow ( )

   (c) Schleiden ( ) *(d)* Robert Hooke ( )

3. In mitochondria, cristae are sites for

(a) increasing the capacity of the mitochondrion to synthesize ATP ( )

(b) phosphorylation of flavoproteins ( )

(c) breakdown of macromolecules ( )

(d) the cell's overall packaging ( )

4. Which of the following is the largest single membrane-bound intracellular compartment?

(a) Ribosome ( ) (b) Golgi apparatus ( )

(c) Endoplasmic reticulum ( ) (d) Lysosome ( )

5. Golgi apparatus are involved in

(a) modification of proteins ( )

(b) synthesis of proteins ( )

(c) degradation of proteins ( )

(d) digestion and waste removal ( )

6. Which is the most abundant protein in human body?

(a) Hemoglobin ( ) (b) *Collagen* ( )

(c) Fibrinogen ( ) (d) Albumin ( )

7. Exportin binds the cargo

(a) inside the nucleus ( ) (b) inside the cytoplasm ( )

(c) in the mitochondria ( ) (d) in the nuclear lamina ( )

8. What is G_0?

(a) Cyclin-dependent kinase ( )

(b) Checkpoint just before G_1 ( )

(c) Cell cycle control point ( )

(d) Complete resting stage of cell cycle ( )

9. Programmed cell death is called

(a) anaplasia ( ) *(b)* metastasis ( )

(c) apoptosis ( ) *(d)* angiogenesis ( )

10. The characteristic of _____ stage is the separation of sister chromatids.

(a) prophase ( ) *(b)* metaphase ( )

(c) anaphase ( ) *(d)* telophase ( )

(SECTION : B—SHORT ANSWERS)

(*Marks* : 25)

Write short notes on any *five* of the following, taking at least *one* from each Unit : 5×5=25

UNIT—I

1. Structure of prokaryotic cell

2. Facilitated transports

UNIT—II

3. Peroxisomes

4. Structure of prokaryotic ribosomes

UNIT—III

5. Microtubules

6. Microfilaments

UNIT—IV

7. Cell cycle checkpoints

8. Cyclin-CDK complex

(SECTION : C—DESCRIPTIVE)

(*Marks* : 40)

Answer *four* of the following questions, taking *one* from each Unit : 10×4=40

UNIT—I

1. Give an account of cell theory. Explain its tenets and limitations. 4+6=10

2. Describe the ultrastructure of cell membrane. State briefly the functional significance of cell membrane. 5+5=10

UNIT—II

3. Describe the structure and function of Golgi complex. 10

4. Describe in detail the structure and function of lysosomes. 10

UNIT—III

5. Give a detailed account of the structure and transport of molecules across nuclear membrane. 10

6. Write notes on the composition and function of extracellular matrix. 10

UNIT—IV

7. Describe the different stages of first meiotic cell division with suitable diagrams. 10

8. Write short notes on the following : 5+5=10

(a) Carcinogens

(b) Characteristic of cancer cell

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