Total No. of printed pages = 5

63/2 (SEM-1) BIT 103

2021

(held in 2022)

BIOTECHNOLOGY

(Theory Paper)

Paper Code : BIT-103

(Cell And Development Biology)

Full Marks – 80

Time – Three hours

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

1. Choose the correct answer : 1×8=8

(i) Which of the following microorganism have two nuclei ?

(a) Slime Molds

(b) Cyanobacteria

(c) Amoeba

(d) Paramecium

[Turn over

(ii) Non-membrane bound body of the nucleus which disappears in the late prophase and reappears in telophase _____.

(a) Nucleolus (b) Chromosome

(c) Nucleoplasm (d) Nuclear pore

(iii) The histone octamer contains _____ of histones.

(a) 4 types (b) 5 types

(c) 6 types (d) 8 types

(iv) Microfilaments are composed of a protein called

(a) Tubulin (b) Actin

(c) Myosin (d) Chitin

(v) Lysosomes are known as "suicidal bags" because

(a) Parasitic activity

(b) Presence of food vacuole

(c) Hydrolytic activity

(d) Catalytic activity

(vi) The resting potential membrane is determined by

(a) Potassium-ion gradient

(b) Sodium-ion gradient

(c) Bicarbonate-ion gradient

(d) Chloride-ion gradient

(vii) Which cell organelle is involved in apoptosis ?

(a) Lysosome (b) ER

(c) Golgi (d) Mitochondria

(viii) The oxygen and carbon-dioxide crosses the plasma membrane by the process of

(a) Active diffusion

(b) Facilitated diffusion

(c) Passive diffusion

(d) Random diffusion.

2. Answer the following questions : 2×6=12

(a) What is the Endo-symbiotic theory represent ?

(b) Write two functions of golgi bodies.

(c) Define endocytosis and exocytosis.

(d) What are integrins ?

(e) What are haematopoietic stem cells ?

(f) What are Cyclin Cdk complexes ?

3. Write short notes on any *four* of the following : 5×4=20

(a) The Cell Theory

(b) Endo-membrane System

(c) G-Protein Coupled Receptors

(d) The Cell Cycle

(e) Apoptosis

(f) Gap Junctions.

4. Answer any *two* from the following : 8×2=16

(a) Explain briefly the structure of the plasma membrane. Outline the different functions performed by the plasma membrane.

(b) How is the chromatin packaged inside the nucleus ? Give an account of the organization of the chromatin in the nucleus. Support your answer with relevant diagrams.

(c) What are second messengers? Explain the mechanism of hormone action through Ca^{2+} and Phosphatidylinositol as the second messengers.

5. Answer any *two* from the following : 12×2=24

(a) Write an account on the structure and function of the nucleus. Also add notes on its components such as the nuclear envelope, nucleolus and lamina.

(b) Give a brief account on the structural organization of the cell wall. Briefly discuss the formation of cell wall. Support your answer with suitable diagram.

(c) Discuss the development of *Drosophila melanogaster* and how the genes control their development.