

Total number of printed pages-6

63/1 (SEM-1) CC2/BOTHC1026

2024

BOTANY

Paper : BOTHC1026

(Biomolecules and Cell Biology)

Full Marks : 60

Pass Marks : 24

Time : Three hours

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

1. Choose the correct answer from the following: **(any five)** 1×5=5

(a) Which cell organelles have extra-nuclear DNA ?

(i) Lysosome and Golgi body

(ii) Mitochondria and Plastids

(iii) Golgi body and ER

(iv) Vacuole and Ribosome

(b) The outermost covering of the plant cell is constituted by

(i) Lignin

(ii) Chitin

(iii) Protein

(iv) Cellulose

(c) The longest stage in the cell cycle is

(i) Interphase

(ii) Metaphase

(iii) Telophase

(iv) Prophase

(d) Which cell organelles is selective barrier ?

(i) Cell wall

(ii) Endoplasmic reticulum

(iii) Plasma membrane

(iv) Golgi body

(e) The main compositions of Chromatin are

(i) Lipid and Fats

(ii) Protein and Carbohydrate

(iii) DNA and Protein

(iv) Carbohydrate and Lipid

(f) Dead cells remain in the stage of

(i) G₁ phase

(ii) G₂ phase

(iii) G₀ phase

(iv) S-phase

(g) The type of sugar present in DNA and RNA is

(i) Xylose

(ii) Ribose

(iii) Rhamnose

(iv) Galactose

(h) The universal carrier of chemical energy in the cell is

(i) ADP

(ii) ATP

(iii) Protein

(iv) Fats

- (i) The pH of pure water is
- (i) 6
 - (ii) 7
 - (iii) 9
 - (iv) 10
- (j) Proteins that act like catalyst is called as
- (i) Hormones
 - (ii) Lipids
 - (iii) Proteins
 - (iv) Enzymes

2. Answer the following questions : **(any five)**
2×5=10

- (a) Define simple and complex carbohydrate.
- (b) How are cells classified on the basis of nucleus ?
- (c) Write *two* functions of Golgi bodies in plant cell.
- (d) Why is sugar of DNA called deoxyribose sugar ?
- (e) Differentiate between the coenzymes and cofactors.
- (f) What are histone proteins ?

- (g) Mention *two* chemical properties of DNA.

3. Answer **any five** of the following questions :
5×5=25

- (a) Draw and describe of a typical prokaryotic cell.
- (b) Write a brief note on semiautonomous nature of Chloroplast.
- (c) Write the physical and chemical properties of Chromatin fibre.
- (d) With a neat labelled diagram discuss the structure of endoplasmic reticulum.
- (e) Discuss the lock and key hypothesis of enzyme action.
- (f) What is a checkpoint? Discuss the different checkpoints of cell cycle.
1+4=5
- (g) Discuss the different phases of eukaryotic cell cycle with suitable diagram.
- (h) Distinguish between Rough endoplasmic reticulum and Smooth endoplasmic reticulum.
- (i) Explain briefly the process of Phagocytosis.

4. Answer **any two** of the following questions :
10×2=20

- (a) Write an illustrative note on ultrastructure and function of mitochondria. 5+5=10
- (b) Describe with neat labelled diagram of the structures and functions of microtubules. 7+3=10
- (c) What is M-phase of cell cycle ? Discuss its various stages of eukaryotic cell with suitable diagram. 2+8=10
- (d) What are nucleic acids ? Draw and describe the major structural features of B-DNA. 2+8=10