

2023
B.A./B.Sc.
First Semester
CORE – 2
BOTANY
Course Code: BOC 1.21
(Biomolecules & Cell Biology)

Total Mark: 70

Pass Mark: 28

Time: 3 hours

Answer five questions, taking one from each unit.

UNIT-I

1. On what basis are carbohydrates classified? Describe the structure of a common monosaccharide. Citing two examples of storage polysaccharides, briefly describe the various types of bonds found in them. 3+7+4=14
2. Elucidate on the various classes of lipids. Discuss the structure and functions of triacyl glycerol. 6+8=14

UNIT-II

3. Describe the structural key features of a standard amino acid? What is native state of a protein? Briefly describe the various levels of protein structure citing an example each against a specific structural level. 4+2+8=14
4. Describe the structure of B-DNA with appropriate diagrams. How do different types RNA function within a living cell? 9+5=14

UNIT-III

5. Explain the phrase “Living things obey the laws of thermodynamics.” Describe the major types of biochemical reactions which underlie energy

transduction in living cells and highlight on the structure and significance of adenosine triphosphate in bioenergetics. $4+6+4=14$

6. Write notes on the following: $7 \times 2 = 14$
- (a) Basis and major classes of enzyme classification
 - (b) Michaelis-Menten equation

UNIT-IV

7. Give an account of fluid mosaic model of cell membrane. Discuss in detail the various types of active transport across the membrane. $5+9 = 14$
8. Explain how mitosis differs from meiosis. With appropriate diagrams, describe the cell cycle, laying emphasis on the regulatory checkpoints. $4+10 = 14$

UNIT-V

9. Explain why mitochondria and chloroplasts are called semi-autonomous organelles. Describe the structure and functions of these two cell organelles. $4+10=14$
10. Write notes on the following: $7 \times 2 = 14$
- (a) Endoplasmic reticulum
 - (b) Cytoskeleton
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