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**GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR
(GIET UNIVERSITY)**

Ph.D. (Second Semester-Summer) Examinations, May - 2025

**23SPPEBTS2011 - Advanced Biotechnology
(Biotechnology-SoS)**



Time: 3 hrs

Maximum: 70 Marks

The figures in the right hand margin indicate marks.

Answer ANY FIVE Questions.

(14 x 5 = 70 Marks) Marks

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| 1.a. | Write in details about the Ramachandran Plot? What is its significance? | 7 |
| b. | Write Short Notes on: | 7 |
| | i) Hydrophobic amino acids | |
| | ii) Fibrous Proteins | |
| 2.a. | Give a brief note on secondary and tertiary structure of protein and its significance? | 7 |
| b. | Discuss the various types of non-covalent bonds responsible for protein stabilization? | 7 |
| 3.a. | Give an account of types and arrangements of membrane protein? | 7 |
| b. | Describe Magnetic Resonance Microscopy | 7 |
| 4.a. | Write the principle of X-Ray Crystallography and how it is used in determine protein structure? | 7 |
| b. | Write on activated sludge system. | 7 |
| 5.a. | Give an account of suspended and attached biological waste water treatment system. | 7 |
| b. | Write on Yeast Artificial Chromosome (YAC) and its uses? | 7 |
| 6.a. | What is CRISPR Technology? How it is used in gene editing? Write its applications. | 7 |
| b. | Describe on three vectors which are frequently used in genetic engineering. | 7 |
| 7.a. | Give a detail account on nutritional requirement of animal cells? | 7 |
| b. | Write short notes on: | 7 |
| | (i) Importance of animal cell culture? | |
| | (ii) Contact inhibition | |
| 8.a. | Explain about the rector based animal cell culture? | 7 |
| b. | Explain about the growth kinetics and doubling of animal cell? | 7 |

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