: Reg. No | | | | | | | | | | | AY 24

**GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY, ODISHA, GUNUPUR**

# (GIET UNIVERSITY)

M. Sc. (First Semester - Regular) Examinations, February – 2025

## 24MBIPC11002 – Cell and Molecular Biology

(Biotechnology)

Time: 3 hrs | Maximum: 60 Marks

**Answer ALL questions**

**(The figures in the right hand margin indicate marks)**

**PART – A** **(2 x 5 = 10 Marks)**

| Q.1. Answer ***ALL*** the questions | CO # | Blooms Level |
|---|---|---|
| a. State the function of oxysome particles in mitochondria. | CO1 | K1 |
| b. List out the different histone proteins involved in the formation of nucleosomes. | CO2 | K2 |
| c. How do methylation and acylation of histone proteins affect gene expression? | CO3 | K2 |
| d. Write the negative and positive control for the expression of operon. | CO4 | K1 |
| e. Explain isoaccepting tRNA. | CO5 | K1 |

**PART – B** **(10 x 5 = 50 Marks)**

| Answer ***ALL*** the questions | Marks | CO # | Blooms Level |
|---|---|---|---|
| 2.a. How does compartmentalization be an advanced feature in eukaryotes over prokaryotes? | 5 | CO2 | K3 |
| b. What are the universal features of cells? | 5 | CO1 | K1 |
| (OR) | | | |
| c. Draw a neat and labelled diagram of an animal cell showing different microscopic structural components | 5 | CO2 | K2 |
| d. Describe the structural features of mitochondria in cells. | 5 | CO1 | K2 |
| 3.a. Describe the chromatin control on gene transcription and gene silencing in eukaryotic cells. | 7 | CO2 | K2 |
| b. How do mitochondria associate with cell energetics? | 3 | CO1 | K1 |
| (OR) | | | |
| c. Describe the regulation of Lac and Trp operons. | 7 | CO2 | K2 |
| d. List the functions of different types of cytoskeletons in cells. | 3 | CO1 | K1 |
| 4.a. Describe the mechanism of nuclear transport. | 7 | CO3 | K2 |
| b. Write the structural forms that make the membrane to be selectively permeable. | 3 | CO3 | K1 |
| (OR) | | | |
| c. Enlist the molecular machinery required for DNA replication in prokaryotic and eukaryotic cells and their respective function. | 7 | CO3 | K2 |
| d. Describe the cell cycle. | 3 | CO3 | K1 |
| 5.a. Explain with a neat diagram, the processes of mitosis and meiosis. | 7 | CO4 | K2 |
| b. What are the molecules transported across the nuclear membrane? | 3 | CO4 | K2 |
| (OR) | | | |
| c. Describe different types of microscopic techniques used to observe cells and their characteristics. | 7 | CO4 | K2 |
| d. What is mutation? Write its role in biological evolution. | 3 | CO4 | K2 |
| 6.a. Enumerate the technique of fibroblast cell culture stepwise. | 7 | CO5 | K2 |

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|---|---|---|---|---|
| b. | What is the importance of cell division in multicellular eukaryotes? | 3 | CO5 | K1 |
| | (OR) | | | |
| c. | What are the different mutagens and genes involved in cancer? Enlist and diagrammatically shows different types of mutations. | 7 | CO5 | K2 |
| d. | Give a list of non-membrane, single, and double membrane-bound organelles in eukaryotic cells. | 3 | CO5 | K1 |

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