

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



B. Tech (Third Semester - Regular) Examinations, November – 2024  
**23BBTPC23001 - Fundamentals of Biology and Biotechnology**  
(Biotechnology)

Time: 3 hrs

Maximum: 60 Marks

(The figures in the right hand margin indicate marks)

**PART – A****(2 x 5 = 10 Marks)**Q.1. Answer **ALL** questions

- |   | CO # | Blooms<br>Level |
|---|------|-----------------|
| a. Outline the functions of the endoplasmic reticulum in eukaryotic cells, distinguishing between rough and smooth endoplasmic reticulum. | CO1  | K2              |
| b. When did an eukaryotic cell enters into G0 Phase ?   | CO2  | K2              |
| c. What were the two strains of <i>Streptococcus pneumoniae</i> used by Griffith in his experiments?                                      | CO3  | K2              |
| d. Mention the importance of restriction endonuclease enzymes.  | CO4  | K3              |
| e. Write down the properties of an ideal vector.  | CO5  | K3              |

**PART – B****(10 x 5 = 50 Marks)**Answer **ALL** the questions

- |   | Marks | CO # | Blooms<br>Level |
|---|-------|------|-----------------|
| 2. a. Discuss the structural and functional characteristics that distinguish plant and animal cells as basic units of life. Describe the ultra-structure of an animal cell.<br>(OR) | 3+7   | CO1  | K3              |
| b. Discuss the dynamic nature of the cell membrane, emphasizing the fluid mosaic model.   | 5     | CO1  | K2              |
| c. Explain the structure and functions of the endoplasmic reticulum (ER) in eukaryotic cells.   | 5     | CO1  | K2              |
| 3.a. What are the significances of cell division? Describes various phases of Meiosis-I.<br>(OR)  | 2+8   | CO2  | K3              |
| b. Give a note on nucleosome concept.   | 5     | CO2  | K2              |
| c. Explain cAMP pathway of cell signalling.   | 5     | CO2  | K3              |
| 4.a. Explain the experimental evidence that established DNA as the genetic material, highlighting the contributions of Griffith and Hershey-Chase<br>(OR)                           | 5+5   | CO3  | K3              |
| b. Discuss the structure of DNA as proposed by Watson and Crick.  | 5     | CO3  | K3              |
| c. How do you isolate DNA from animal cell? Write down the formula for yield analysis.  | 5     | CO3  | K3              |
| 5.a. What is r-DNA technology? Describe the role of different molecular tools used in r-DNA technology.<br>(OR)   | 2+8   | CO4  | K3              |
| b. Discuss on Milestones in Biotechnology.  | 5     | CO4  | K2              |
| c. Give a note on C-DNA synthesis.  | 5     | CO4  | K3              |
| 6.a. What do you mean by gene cloning? Explain the detailed process of gene cloning in prokaryotes.<br>(OR)   | 2+8   | CO5  | K3              |
| b. Give a note on pBR322 and Cosmid vectors   | 5     | CO5  | K2              |
| c. Discuss on Bacteriophage and YAC.  | 5     | CO5  | K3              |

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