

BBCCT-125

ASSIGNMENT BOOKLET

**Bachelor's Degree Programme
B.Sc. Hons in Biochemistry (BSCBCH)**

GENETIC ENGINEERING AND BIOTECHNOLOGY

Valid from January, 2025 to Dec, 2025



**School of Sciences
Indira Gandhi National Open University
Maidan Garhi
New Delhi-110068.**

Dear Student,

Please read the section on assignments in the Programme Guide for Core Courses that we sent you after your enrolment. A weightage of 30 per cent, as you are aware, has been earmarked for continuous evaluation, **which would consist of one tutor-marked assignment** for this course. The assignment is in this booklet, and it consists of three parts, Part A, B and C. The total marks of all the parts are 100, of which 35% are needed to pass it.

Instructions for Formatting Your Assignments

Before attempting the assignment please read the following instructions carefully:

- 1) On top of the first page of your answer sheet, please write the details exactly in the following format:

ROLL NO.:

NAME:

ADDRESS:

.....

.....

COURSE CODE:

COURSE TITLE:

ASSIGNMENT NO.:

STUDY CENTRE: **DATE:**

PLEASE FOLLOW THE ABOVE FORMAT STRICTLY TO FACILITATE EVALUATION AND TO AVOID DELAY.

- 2) Use only foolscap size writing paper (but not of very thin variety) for writing your answers.
- 3) Leave 4 cm margin on the left, top and bottom of your answer sheet.
- 4) Your answers should be precise.
- 5) Complete each of Part A, Part B and Part C of this assignment separately, and **submit them together.**
- 6) The assignment answer sheets are to be submitted to your Study Centre as per the schedule made by the study centre. **Answer sheets received after the due date shall not be accepted.**

We strongly suggest that you retain a copy of your answer sheets.

- 7) This assignment is **valid from 1st January, 2025 to 31st Dec, 2025** and submit it as per the instructions given in the Programme Guide.
- 8) **You cannot fill the exam form for this course** till you have submitted this assignment.

We wish you good luck.

ASSIGNMENT
MOLECULES OF LIFE

Course Code: BBCCT-125
Assignment Code: BBCCT-125/TMA/2025
Maximum Marks: 100

Answer all the questions given below.

1. Define Recombinant DNA Technology and describe the steps involved in its process. (5+5) 10
2. What is the role of restriction endonucleases in genetic engineering? List and classify their types. 10
3. Compare and contrast Southern, Northern, and Western blotting techniques. What are their applications? 10
4. Explain the mechanism of action of DNA ligase in joining sticky and blunt-ended DNA fragments. 10
5. What are the steps involved in **gene cloning**, and why is a cloning vector necessary? 10
6. Explain the significance of **synthetic oligonucleotides** in molecular cloning and the steps involved in their synthesis. 10
7. Describe the **polymerase chain reaction (PCR)** and its variants. How does PCR contribute to genetic engineering? 10
8. Discuss the principles and methods used in **DNA sequencing**. Why is sequencing essential in genetic studies? 10
9. Illustrate the application of **genetic engineering in medicine**, focusing on the production of recombinant human insulin. 10
10. A) How has **recombinant DNA technology** influenced agricultural practices? Provide examples. 5
B) Discuss the environmental and ethical implications of **genetically modified organisms (GMOs)**. 5