

BBCCT-123

ASSIGNMENT BOOKLET

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

GENE EXPRESSION AND REGULATION

Valid from Jan, 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 total marks 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.

1. Use only foolscap size writing paper (but not of very thin variety) for writing your answers.
2. Leave 4 cm margin on the left, top and bottom of your answer sheet.
3. Your answers should be precise.
4. 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.**
5. **We strongly suggest that you retain a copy of your answer sheets.**
6. This assignment is **valid from Jan, 2025 to Dec, 2025** and submit it as per the instructions given in the Programme Guide.
7. **You cannot fill the exam form for this course** till you have submitted this assignment.

We wish you good luck.

ASSIGNMENT
GENE EXPRESSION AND REGULATION

Course Code: BBCCT-123
Assignment Code: BBCCT-123/TMA/2025
Maximum Marks: 100

Answer all the questions given below.

1. A) Define transcription and explain its significance in molecular biology.
B) Differentiate between transcription and DNA replication in terms of enzymes and processes involved. (5+5) 10
2. A) What are the primary differences between prokaryotic and eukaryotic transcription? 5
B) Explain the role and structure of RNA polymerase in prokaryotic transcription. 5
3. What is a promoter, and how does it contribute to the initiation of transcription? 10
4. A) Illustrate the DNA footprinting technique and discuss its importance. 5
B) Describe the processes involved in the maturation of eukaryotic mRNA, including the addition of the cap and Poly-A tail. 5
5. A) What are exons and introns, and how are they related to RNA splicing? 5
B) Explain the concept of the genetic code and its role in translation. 5
6. A) Describe the steps of translation, including initiation, elongation, and termination. 10
7. Discuss the operon concept and its significance in prokaryotic gene regulation. 10
8. Explain chromatin remodeling and its role in gene expression in eukaryotes. 10
9. A) How do environmental conditions influence gene expression in prokaryotes? Provide examples. 10
10. How are antibiotics used to inhibit transcription in prokaryotes? Provide examples of such inhibitors. 10