[This question paper contains **2** printed pages.]

Your Roll No_____

Sr. No. of Question Paper : **3078**

Unique paper code : 2162521201

Name of the Course : B.Sc. Life Science Botany DSC

Name of the Paper : Genetics and Molecular Biology

Semester : II

Duration : 2 hours **Maximum Marks: 60**

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **four** questions in all including **Question No. 1 which is compulsory**.
3. All parts of a question must be answered together.
4. All questions carry equal marks.

1. a) Define the following: (**any five**) 1x5=5
   i. Variation
   ii. Tandem duplication
   iii. Suppressor mutation
   iv. Genotype
   v. Allele
   vi. Autopolyploidy

b) Give one significant contribution of the following: (**any five**) 1X5=5

   i. George Beadle and Edward Tatum
   ii. François Jacob and Jacques Monod
   iii. Alfred Hershey and Martha Chase
   iv. Thomas Hunt Morgan
   v. William Bateson and Reginald Punnett
   vi. Carl Correns

c) Expand the following: (**any five**) 1x5=5

   i. 5-BU
   ii. ORF
   iii. NTP
   iv. F_1
   v. PKU
   vi. hnRNA

2. Write short notes on the following: (**any three)** 5X3=15

i. Chemical mutagens
ii. Chromosomal theory of inheritance
iii. Central dogma of Molecular Biology
iv. Turner's syndrome

3. Differentiate between the following: (**any three)** 5X3=15

i. Rho-dependent and rho-independent termination of transcription
ii. Pericentric and paracentric inversion
iii. tRNA and mRNA
iv. Euploidy and Aneuploidy

4. Draw a well-labelled diagram of the following: **(any three)** 5X3=15

i. B-DNA
ii. Chloroplast inheritance
iii. Replication fork
iv. Ancestry of wheat

5. Answer the following: 8+7=15

i. Explain variations in chromosome number and structure with the help of well-labelled diagrams.
ii. What is operon? Explain the working of Lac Operon with the help of suitable diagrams.

6. Attempt the following: 8+7=15

i. In a species tall (D) is dominant over dwarf (d), and blue flowers (W) is dominant over white (w). Consider two tall plants with blue flowers labelled A and B. Each was crossed to a dwarf plant with white flowers. The seeds resulting from each cross were collected and grown into F_1 plants which showed the following phenotypic classes:

Progeny of A	151 tall, blue 149 dwarf, blue
Progeny of B	74 tall, blue 76 tall, white 75 dwarf, blue 75 dwarf, white

What were the genotypes of A and B? Diagram the cross.

ii. Define genetic code. Discuss Nirenberg and Matthaei's experiment that led to the deciphering of genetic code.

(2000)