[This question paper contains 2 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 5966 **J**

Unique Paper Code : 2162521201

Name of the Paper : Genetics and Molecular Biology

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

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. Question No. **1** is compulsory
3. Attempt **four** questions in all
4. Attempt **all** the parts of a question together.

1. (a) Fill in the blanks : (1×5=5)

   (i) Chromosome theory of inheritance was given by _____ .

   (ii) Number of base pairs per turn in B-DNA is _____ .

   (iii) ORF stands for _____ .

   (iv) _____ site in the ribosome is the site where peptidyl tRNA attaches during elongation.

   (v) Alleles of different genes that are present on the same chromosome form a _____ group.

   (b) Define **any five** of the following : (1×5=5)

   (i) Okazaki fragments
   (ii) DNA Polymerase
   (iii) Lethal mutation
   (iv) Duplicate genes
   (v) Replication fork
   (vi) Genetic code

P.T.O.

(c) Match the following : (1×5=5)

(i) Gregor Johann Mendel	concept of gene
(ii) Watson and Crick	Mutations
(iii) Wilhelm Johannsen	ABO blood group
(iv) Hugo de Vries	Structure of DNA
(v) Karl Landsteiner	Principles of inheritance

2. Write short notes on the following **(any three)** : (5×3=15)
(Draw appropriate diagrams and give examples wherever necessary)
(i) tRNA
(ii) Epistasis
(iii) Reciprocal Translocation
(iv) Transposons
(v) Mutagens

3. Differentiate between **any three** of the following : (5×3=15)
(Draw appropriate diagrams and give examples wherever necessary)
(i) Incomplete dominance and Co-dominance
(ii) Linkage and Crossing Over
(iii) Autopolyploidy and allopolyploidy
(iv) RNA polymerase I, II and III
(v) Positive and negative regulation of Lactose Operon

4. Explain **any three** of the following with the help of diagrams. (5×3=15)
(i) Translation in Prokaryotes
(ii) Attenuation
(iii) Semi-discontinuous replication of DNA
(iv) Paracentric inversion heterozygotes and inversion bridge

5. (a) What is the central dogma of molecular biology? Explain the concept and exceptions to this dogma. (5)

(b) What is pleiotropism? Explain how is it different from Polygenic inheritance with the help of suitable examples. (7)

(c) State Mendel's law of independent assortment. (3)

6. (a) Describe the experiment to prove the semi-conservative mode of DNA replication. (6)

(b) Explain the inheritance of plastids in *Mirabilis jalapa* (Four O'clock plant) with the help of suitable diagrams. (6)

(c) Discuss in brief the *cis-trans* complementation test. (3)

(1800)