(i) Printed Pages : 3 Roll No. .....

(ii) Questions : 9 Sub. Code : 0 3 5 8

Exam. Code : 0 0 0 4

B.A./B.Sc. (General) 4th Semester

(2053)

BIO-TECHNOLOGY

Paper : BIOT–Elect-Sem-IV–T : Fundamentals of Molecular Biology and Genetics

Time Allowed : Three Hours] [Maximum Marks : 75

Note :— Attempt **five** questions in all by selecting **two** questions each from Section A and B. Section C is compulsory. All questions carry equal marks.

SECTION–A

1. (a) Discuss the structure of various types of DNA and mention their properties. 8

   (b) Mention the experiment which proved that DNA is the molecular basis of life. 7

2. (a) Describe the structure and function of various prokaryotic and eukaryotic DNA polymerases and their role. 8

   (b) Discuss the molecular mechanism of homologous recombination in prokaryotes and eukaryotes. 7

3. (a) Distinguish with diagram the detailed structures of a prokaryotic and an eukaryotic gene. 7

   (b) Describe the post transcriptional modification events. 8

4. (a) Give the difference between the initiation process in prokaryotes and eukaryotes. 7

(b) What kind of post transcriptional modifications takes place in Eukaryotes ? Does the same occur in Prokaryotes ? 8

SECTION–B

5. (a) Discuss the process of translation in Prokaryotes. Why is the first amino acid formulated in prokaryotes ? 7½

(b) Describe the gene expression system with reference to Histidine operon. 7½

6. (a) What do you understand by catabolic repression and how does it regulate gene expression in prokaryotes ? Explain with diagram. 7

(b) Mention the following post-translational modifications :

(1) Acetylation

(2) Phosphorylation. 8

7. (a) Mention what types of numerical aberrations are found in chromosomes in human. 8

(b) Discuss the Mendelian Laws of inheritance. 7

8. (a) What is chromosome banding ? Discuss the various types of banding and their significance. 8

(b) Give an account of various chemical mutagens and their effect on the DNA. 7

SECTION–C

(Compulsory Question)

9. Write briefly about :

(1)	Linkage and recombination	2
(2)	Klenow fragment	2
(3)	Spliceosome	3
(4)	Capping and Polyadenylation of mRNA	2
(5)	Nonsense and Frameshift mutation	2
(6)	Aneuploidy and autoploidy	2
(7)	Transposons	2