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

(ii) Questions : 9 Sub. Code : 0358

Exam. Code : 0004

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

(2054)

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 Sections A and B. Section C is compulsory. All questions carry equal marks.

SECTION—A

1. (a) Explain the experiment which proved that DNA was the molecular basis of life. 7

   (b) Give the detailed structure of Z-DNA, its properties and how is it different from B-DNA ? 8

2. (a) Describe the structure and function of various prokaryotic polymerases and their role in replication. 7

   (b) Give the molecular mechanism of recombination in the Holliday model of homologous recombination and mention its significance. 8

3. (a) Describe with diagram the detailed structure of a prokaryotic gene. 7

(b) Describe the molecular mechanism of mRNA capping and poly A tailing after synthesis and why are these processes necessary in eukaryotes. 8

4. (a) Give the difference between the initiation of transcription 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) Explain with diagram the various steps of translation in prokaryotes. 7½

(b) What is post translational modification ? Describe how acetylation and phosphorylation modification takes place on protein. 7½

6. (a) What do you understand by catabolic repression and how does it regulate gene expression in prokaryotes ? 7½

(b) Discuss the prokaryotic gene expression in respect of Histidine operon. 7½

7. (a) What are the numerical aberrations and how are they caused ? Discuss how numerical aberrations of chromosomes cause diseases in human with examples. 8

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

8. (a) With help of model system explain the linkage based mapping. 8

(b) Discuss the G-banding and C-banding in chromosomes. What is the significance of chromosome banding ? 7

SECTION—C

(Compulsory Question)

9. Write briefly about :

(i) Difference between nucleoside and nucleotide. 2

(ii) Prebnow box. 2

(iii) Sigma factor. 3

(iv) Operon. 2

(v) Nonsense and point mutation. 2

(vi) Okazaki fragments. 2

(vii) Gene frequency. 2