

1057

B.A./B.Sc. (General) Fourth Semester  
Bio-Technology

BIOT-Elec-Sem-IV-T: Fundamental of Molecular Biology and Genetics

Time allowed: 3 Hours

Max. Marks: 75

**NOTE:** Attempt five questions in all, including Question No. IX (Unit-III) which is compulsory and selecting two questions each from Unit I - II.

x-x-x

**UNIT - I**

- I. a) Describe the experiment which gives the evidences that DNA is the molecular basis of life?  
b) Describe the process of replication in prokaryotes with diagram? (2x7½)
- II. a) Describe the structure of DNA with various types and their properties?  
b) Describe the molecular mechanisms involved in Homologous recombination with diagram? (2x7½)
- III. a) What are the major differences between eukaryotic and prokaryotic genes?  
b) What major post-transcriptional modifications occur in the eukaryotes? (2x7½)
- IV. a) What is rho dependent and rho independent termination of transcription?  
b) How is RNA processed and modified after its synthesis in eukaryotes? (2x7½)

**UNIT - II**

- V. a) Describe the translational process in prokaryote with diagram?  
b) Discuss the role of various transcription factors in regulating gene expression in eukaryotes? (8,7)
- VI. a) What do you understand by post translational modifications? Discuss in relation to Acetylation?  
b) How does the termination process of translation in prokaryotes differ from eukaryotes? Describe with the help of diagrams? (8,7)
- VII. a) Discuss the Mendel's two laws of inheritance with examples?  
b) How is chromosomal banding help in identifying structural aberrations in chromosomes? (8,7)

P.T.O.

(2)

- VIII. a) Describe the Hardy-Weinberg law and how is it used to find the gene frequency?  
 b) Define mutation? Give a detailed account of mutations caused by various chemical mutagens? (8,7)

### UNIT – III

IX. Write in brief about:-

- a) Primer and Primase (2)
- b) Promoter and Represser (2)
- c) Phosphorylation (2)
- d) Allelic and gene frequency (2)
- e) Induced mutations (2)
- f) Punnet Square (2½)
- g) Linkage in mapping (2½)

x-x-x