

1128  
B.Sc. (Hons.) Biotechnology  
Fifth Semester  
BIOT-Sem-V-I-T: Molecular Biology

Time allowed: 3 Hours

Max. Marks: 67

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting one question from each Unit.

x-x-x

I. Write in brief about following:-

- a) Sugar pucker
- b) Factors that contribute to high fidelity of DNA replication
- c) Kozak sequence
- d) Promoters of prokaryotes
- e) How aminoacyl synthetase differentiates between isoleucine and valine? (5x3)

**UNIT - I**

- II. a) What are scaffold attachment regions (SARs) and how they help in chromatin condensation?
- b) Differentiate the structure of B DNA and Z DNA (7,6)
- III. a) Discuss Ac/Ds system in maize.
- b) Draw the CG base pairing. (7,6)

**UNIT - II**

- IV. a) Discuss the famous experiment of Avery et al. Elaborate the objective and conclusion of the experiment. Who were the other?
- b) What features characterize origins of replication in bacterial cells and how are they recognized by the replication machinery. (7,6)
- V. a) Differentiate between DNA polymerase I and III. What is the role of helicase in DNA replication?
- b) Discuss in brief the replication of M13 bacteriophage. (7,6)

P.T.O.

(2)

**UNIT - III**

- VI. a) In *E. coli* precise spacing between the -35 and -10 conserved promoter elements has been found to be a critical determinant of promoter strength. Give reason. Discuss in brief about abortive transcription.
- b) Discuss in brief the posttranscriptional modifications. (6,7)
- VII. a) Discuss in brief about the promoter recognized by RNA polymerase I.
- b) What is  $\alpha$  aminitin? How it helped in identification of three types of RNA polymerases in eukaryotic system?
- c) How the initiation of transcription is different in eukaryotes and prokaryotes. (4,4,5)

**UNIT - IV**

- VIII. a) Name the elongation factors in prokaryotes and discuss its role in translation.
- b) Describe the roles of the A and P sites on the ribosome during translation
- c) How does translation gets initialed in eukaryotes? (4,4,5)
- IX. a) What are two separate regulatory mechanisms for the *lac* operon, with one responsive to glucose and the other responsive to lactose? Discuss in detail. What advantage is provided to *E. coli* by the presence of two separate regulatory mechanisms?
- b) Some operons regulate transcription through the premature termination of transcription. Name the process and Elaborate with help of example (7,6)

x-x-x