Exam. Code : 206602
Subject Code : 5209

M.Sc. (Bioinformatics) 2nd Semester

CONCEPTS IN MOLECULAR BIOLOGY AND r-DNA TECHNOLOGY

Paper—BI-521

Time Allowed—Three Hours] [Maximum Marks—75

SECTION—A

Note :— Attempt **ALL** questions.

I. (a) Briefly describe the components which make up DNA.

(b) How is DNA banding done ? What information does it tell us ?

(c) What is the role of RNA polymerase in transcription ?

(d) What is tRNA ?

(e) How does DNA methylation affect gene expression ?

(f) What are DNA ligases ?

(g) What are palindromic sequences ?

(h) What are the characteristics features that you will keep in mind while designing primers ?

(i) Describe end labeling.

(j) What do you mean by saying that the genetic code is degenerate ? 1.5×10=15

SECTION—B

Note :— Attempt **FIVE** questions, **ONE** from each unit.

UNIT—I

II. How does DNA repair take place in E.coli ? What are the enzymes involved in the process ? 12

III. Describe the different enzymes involved in the process of prokaryotic DNA replication and their functions. 12

UNIT—II

IV. (a) How is the information stored in mRNA sequence translated into proteins ?

(b) Describe the processing of pre-tRNA into mature tRNA molecule. 6+6

V. (a) What is Genetic code ? What do you mean when we say that the genetic code is degenerate ?

(b) What are ribosomes and discuss their role ? Differentiate between the prokaryotic and eukaryotic ribosomes. 6+6

UNIT—III

VI. What is an inducible operon ? Explain by giving an example. 12

VII. Write a note on lambda lytic cascade. 12

UNIT—IV

VIII. (a) What are Restriction endonucleases ? Describe the three types of restriction endonculeases.

(b) What is a lambda vector ? How is it different from a plasmid vector ? 6+6

IX. Write short notes on any **THREE** of the following :—

(a) Taq polymerase

(b) End labeling

(c) Transformation

(d) Cohesive ends. 12

UNIT—V

X. What is a cDNA library ? How will you isolate the clone of interest from it ? 12

XI. What is primer extension ? Discuss its role in molecular biology. 12