Sr. No. 7101

Exam. Code: 206602
Subject Code : 4594

M.Sc. Bio-informatics - 2nd Sem.

(2517)

Paper - BI-521: Concepts in Molecular Biology & rDNA Technology

Time allowed: 3 hrs. **Max. Marks: 75**

SECTION-A

Note: -Attempt **ALL** questions.

1. (a) What is the difference between translation and transcription?
   (b) What are the differences between DNA and RNA?
   (c) Describe the function of restriction enzymes in a host.
   (d) The eukaryotic gene transcripts usually undergo three major modifications. What are these?
   (e) Discuss the role of RNA editing in cell.
   (f) List three ways in which the mRNAs of eukaryotes differ from the mRNAs of prokaryotes.
   (g) Enlist different types of RNA molecules present in prokaryotic and eukaryotic cells.
   (h) What is the role of Taq DNA polymerase in polymerase chain reaction?
   (i) Explain how inducible operon is different from repressible operon
   (j) Role of DNA ligase in construction of a recombinant DNA molecule 1.5x10=15

SECTION-B

Note:- Attempt **FIVE** questions, **ONE** from each Unit.

UNIT-I

2. (a) Outline physical and chemical properties of DNA
   (b) How is excision repair carried out in *E. coli*? 6+6
3. (a) Explain DNA denaturation and renaturation. What is the implication of high number of repetitive DNA sequences in DNA sequencing?
   (b) What are the enzymes and proteins required for DNA replication, and what are their functions? 6+6

UNIT-II

4. (a) What are the important steps in RNA synthesis i prokaryotes?
   (b) Discuss the types of RNA processing that occur only in eukaryotes, not in prokaryotes. 6+6
5. (a) How is the genetic information in mRNAs translated into amino acid sequences of polypeptides?
   (b) Discuss the properties of genetic code. 6+6

UNIT-III

6. (a) Discuss the mechanism of repression and attenuation for regulation of tryphtophan Operon in *E coli*.

PTO

(b) Discuss the lambda lytic regulatory cascade. 6+6

7. (a) What is DNA methylation and imprinting? Discuss their significance in eukaryotic gene regulation.

(b) Briefly discusses the processes involved in X-chromosome inactivation in mammals. 6+6

UNIT-IV

8. (a) List the differences between type I and type II restriction enzymes.

(b) Define vector. Briefly describe features of one plasmid and one phase vector for *E. coli*. 6+6

9. Write short notes on any FOUR of the following: 12

a. DNA ligases
b. Cohesive ends
c. Transformation
d. Phasmid
e. M13 phage vectors

UNIT-V

10 Briefly describe the procedure for construction of a genomic library and explain the strategy for isolation of a desired DNA segment from such a library. 12

11 (a) Discuss commonly used labelling techniques and their application in molecular biology.

(b) Describe the process of reverse transcription . 6+6

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