PG Even Semester Exam, May 2025

Biotechnology

2nd Semester

COURSE NO. BTYCC - 552

[Molecular Biology]

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer five questions, taking one from each Unit

UNIT-I

1. a. Compare between the compactness of gene organization in viral genome and eukaryotic genomes with suitable examples. 7

   b. Discuss the types of repetitive sequences found in human genome and state their significance. 7

2. a. What are gene families? Discuss the different types of gene families. 7

   b. Discuss the significance of operons and overlapping genes in terms of genome organization. 7

UNIT-II

3. Write the process of prokaryotic DNA replication. Highlight the difference between prokaryotic and eukaryotic DNA replication. 9+5=14
4. Write the mechanism of DNA repair with special reference to base excision, nucleotide excision and mismatch repair. 5+5+4=14

UNIT-III

5. What is DNA reassociation kinetics? Describe the typical curves obtained from reassociation studies of prokaryotic and eukaryotic genomes. 2+6+6=14
6. Describe the process of transcription in prokaryotes with suitable diagram. Write a note on characteristics and the functions of bacterial sigma subunits. 10+4=14

UNIT-IV

7. Describe the regulation of translation in prokaryotes and eukaryotes. 7+7=14
8. Write notes on: 7+7=14
   a. Features of genetic code
   b. Aminoacyl synthases and charging of t-RNA

UNIT-V

9. What is protein translational modification? Explain different types of protein post translational modification with suitable diagram. 2+12=14
10. What is RNAi? Describe the mechanism of breakdown of mRNAs and siRNAs with suitable diagram. 2+6+6=14

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