Subject Title: Microbial Genetics and Molecular Biology Prepared by: R.Jhansi
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Unit - I: Microbial Genetics

Short Answers:

1. Alleles
2. Linkage
3. Chargaff's rule
4. Plasmid
5. Transposons
6. Hershey and Chase experiment
7. Crossing over
8. RNA as genetic material
9. Law of independent assortment
10. Law of segregation
11. Law of Dominance

Long Answers:

12. Explain laws of Inheritance with examples
13. Describe Watson and Crick model of DNA
14. Explain Semi-conservative mode of replication
15. Explain crossing over with mechanism
16. Explain DNA as a genetic material.

Unit - II: Mutations

Short Answers:

17. Spontaneous mutation
18. Base pair changes
19. Deletion
20. Insertion

21. Inversion
22. Frameshift mutation
23. Tandem duplication
24. Physical mutagen
25. Excision repair
26. Mismatch repair
27. Recombinational repair
28. SOS repair
29. Chemical mutagen
30. Transduction
31. Conjugation
32. Transformation
33. DNA damage

Long Answers:

34. Define mutation & describe the various classification of mutation
35. List the various types of chemical mutagens and discuss the mechanism of action of chemical mutagens
36. Describe the different types of DNA repair mechanism.
37. Explain the mechanism of transduction.
38. Explain gene transfer through conjugation in E.Coli.
39. Describe in detail the mechanism of transformation

Unit - III: Gene Expression

Short Answers:

40. Muton
41. Recon
42. Cistron
43. One gene-one enzyme hypothesis
44. One gene-one polypeptide hypothesis
45. One gene-one product hypothesis
46. t-RNA

47. r-RNA
48. m-RNA
49. Structural gene
50. Regulatory gene
51. Constitutive gene
52. Wobble hypothesis
53. Genetic code
54. Operon

Long Answers:

55. Discuss the rho dependent and rho independent mechanism of transcription.
56. Briefly describe the mode of protein synthesis in prokaryotes.
57. What is genetic code? Explain its essential features
58. Describe the structure and functions of different types of RNA.
59. Discuss the concept of gene and explain the structural, constitutive and regulatory genes
60. Define operon. Explain the operon concept mode of gene regulation using lac operon of E.coli as examples.
61. Give a brief account on gene cloning method.

Unit - IV: Recombinant DNA technology

Short Answers:

62. Restriction Endonuclease
63. DNA polymerases
64. Ligases
65. Vectors
66. cDNA
67. Genome libraries

Long Answers:

68. Give a detailed account on molecular mechanism of DNA recombinant technology.
69. Briefly describe the construction of genomic library and discuss its advantages.
70. Briefly describe the construction of cDNA library and discuss its advantages.

71. Give an account on application of genetic engineering in different fields.
72. Explain basic principles of genetic engineering.
73. Give an account on enzyme involved in genetic engineering and their mode of action.