

Subject Title: Cell Biology, Genetics and Evolution

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Unit - I: Cell biology

1. Short Answers:

2. Write a short note on cell theory.
3. Give an account of Ultrastructure of animal cell.
4. Give an account of structure and function of Ribosomes.
5. Give an account of structure and function of Lysosomes.
6. Lambrush chromosomes
7. Polytene chromosomes.

Long Answers:

8. Describe the structure and function of plasma membrane.
9. Explain in detail about Endoplasmic Reticulum.
10. Describe the structure and function of Golgi complex.
11. Describe the structure of Mitochondria and its importance in the cell activity.
12. Explain the process of Glycolysis, Krebs cycle, and Electron Transport system in the cell of Mitochondria.
13. Describe the Morphology of chromosomes and types of chromosomes.
14. Describe in detail about Mitotic cell division.
15. Explain various steps involved in Meiotic cell division.

Unit – II; Molecular Biology

Short Answers:

16. Genetic code
17. Operon concept
18. Electrophoresis

Long Answers:

19. Explain in detail about structure and function of DNA.

20. Explain in detail about structure and function of RNA.
21. Write an essay on Replication of DNA.
22. How Transcription and Translation play an important role in Protein synthesis.
23. Describe the regulation of Gene action with the help of Lac Operon model.
24. Define genetic code and write its significance in Central Dogma of Molecular biology.
25. How Polymerase chain reaction can be applied as a tool in disease diagnosis.
26. Explain the method of slab gel Electrophoresis.

Unit – III: Genetics

27. Short Answers:

28. Write a short note of Linkage and Crossing over.
29. Incomplete dominance.
30. Codominance
31. Epistasis.
32. Gene mutation- Deletion, Duplication.
33. Chromosomal mutation-Aneuploidy and polyploidy.
34. Inborn Errors of Metabolism.

Long Answers:

35. Explain the Mendel's and Non Mendel's law of inheritance with suitable examples.
36. Define and describe interaction of genes with suitable examples.
37. Explain in detail about Linkage and Crossing over.
38. Describe the mechanism of Sex determination in man and drosophila.
39. Explain about Sex-Linked inheritance.
40. Write an essay on one gene one enzyme concept and one gene one polypeptide concept.
41. Describe the diseases of man that are caused due to chromosomal mutation.
42. Write an essay on diseases which occur due to chromosomal aberration in man.

Unit – IV; Evolution

Short Answers:

43. Lamarkicism theory.
44. Darwinism theory.

45. Define Hardy Weinberg equilibrium.
46. Write short note on Artificial selection.
47. Allopatric speciation
48. Sympatric speciation.
49. Gene flow
50. Genetic Drift.

Long Answers:

51. Define evolution and describe the theories of evolution.
52. Write an essay on modern synthetic theory of evolution.
53. Define Fossils and types of Fossilization.
54. Explain in detail about Natural selection and describe various types of Natural selection.
55. What is Isolation and explain various types of isolating mechanism acting on the process of organic evolution.
56. Write an essay on Speciation and types of speciation.
57. Explain various forces of evolution.
58. Describe the Homologous and Analogous organs of vertebrates in evolution.
59. Write the role of Extinction in evolution.