

CURRICULUM OF BIOLOGY

Botany

1. Fungi. Cap mushrooms. Mold mushrooms. Parasitic fungi.
2. Angiosperms. Monocots and Dicots Plants.

Zoology

1. General characteristics of animals.
2. Phylum Protozoa. Class Ciliata: Infusoria.
3. Phylum Coelenterates: Polyp Hydra.
4. Phylum Platyhelminthes. Class Turbellaria: Planaria.
5. Phylum Ringed worms: Rainworm.
6. Type of mollusks. Grape Snail.
7. Type of arthropods. Insects and crustaceans.
8. Type of Chordates: Lancelet.
9. Class Fishes.
10. Class Amphibians.
11. Class Reptiles.
12. Class Birds.
13. Class Mammals.

Structure and function of the human body

1. Body tissue and its types.
2. Endocrine glands.
3. Nervous system:
 - Central nervous system (CNS): brain and spinal cord
 - Peripheral nervous system (PNS).
4. Structure and physiology of human eye.
5. Structure and physiology of human ear.
6. Musculoskeletal system and its function:
 - Structure of the human skeleton.
7. Muscular system:
 - Smooth muscles.
 - Striated muscles.
8. Blood:
 - Blood cells.
 - Blood clotting.
9. Cardiovascular system:
 - The heart structures.
 - Large and small circulations.
10. Respiratory system structure and functions:
 - Airways.
 - Lungs.
11. Digestive system structure and functions:
 - Digestion in the mouth.
 - Digestion in the stomach.
 - Digestion in the small intestine.
 - The role of the liver in the digestive process.

12. Excretory system organs and their functions.
13. Skin structure and function.
14. Reproductive system.

General Biology

1. Chemical composition of living organisms. Chemical elements of the cell. Inorganic substances of the cell.
2. Organic substances of the cell (proteins, lipids, carbohydrates). Structure and functions.
3. Nucleic acids. DNA and RNA. Structure and functions.
4. Cell as a structural, functional and developmental unit of living substance.
5. Non-cellular forms of life (viruses and bacteriophages).
6. Cellular forms of life (prokaryotes and eukaryotes).
7. Plant and animal cells.
8. Cell structure.
9. Cell membrane. Structure and functions.
10. Phagocytosis and pinocytosis.
11. Membranous organelles of the cell (endoplasmic reticulum, Golgi complex, lysosomes, mitochondria, plastids). Structure and functions.
12. Non-membranous organelles (ribosome, microtubules, microfilaments, cell center). Structure and functions.
13. Cell inclusions.
14. Cell nucleus (nuclear membrane, karyoplasm, nucleolus, chromatin).
15. Chromosome structure.
16. Chromosome rules.
17. Genetic code and its characteristics.
18. Transcription.
19. Translation.
20. Cell division. Direct and indirect divisions.
21. Mitosis. Biological significance of mitosis.
22. Reproduction. Sexual and asexual reproduction.
23. Asexual reproduction in unicellular and multicellular organisms.
24. Sexual reproduction in unicellular and multicellular organisms.
25. Germ cells. Ovum and sperm cell. Structure.
26. Gametogenesis.
27. Meiosis, biological significance.
28. Differences of spermatogenesis and oogenesis.
29. Fertilization, biological significance.
30. Parthenogenesis.
31. Individual development of the organism. Embryonic development. Postembryonic development.
32. Main terminology of Genetics (heredity, variation, gen, genotype, phenotype, genome, allelic genes, homozygous, heterozygous, dominant and recessive genes).
33. Heredity and inheritance. Types of inheritance (nuclear, cytoplasmic, monogenic, polygenic, autosomal, sex-linked).
34. Monohybrid cross. First and second laws of Mendel.
35. Test cross.
36. Lethal and sublethal genes.

37. Multiple alleles. ABO blood groups.
38. Rh factor. Rh conflict.
39. Dihybrid cross. Mendel's Law of Independent Assortment.
40. Linked inheritance. Morgan's law.
41. Inheritance of sex. Homogametic and heterogametic sex.
42. Sex-linked inheritance.
43. Gene and its properties.
44. Interactions between allelic genes (complete and incomplete dominance, codominance, superdominance).
45. Interactions between non-allelic genes (complementarity, epistasis, polymery).
46. Modification variation.
47. Recombinative variation.
48. Mutation variation, types of mutations (genome, chromosomal, gene).
49. Human genetics investigation methods (genealogical, twins, biochemical, cytogenetic).
50. Darwin's evolutionary theory. Struggle for existence. Natural selection.
51. Species as a unit of evolution. Species criteria. Population as a structural unit of a species.
52. Adaptability of organisms as a result of natural selection and its relative nature.
53. Speciation as a result of evolution.
54. Common origin of wildlife and evidence of evolution. Homologous organs, vestiges and atavisms.
55. Main paths of evolution. Aromorphoses. Idioadaptation. Degeneration.
56. Ecology. Ecological factors.
57. Ecological systems, their composition.
58. Biosphere. Structure and functions.
59. Type of relationship between organisms: parasitism, competition, symbiosis, predation.