UNIT- 1  Biosystematics, Taxonomy and Evolution

- Fundamentals of systematic: Definition and basic concepts of biosystematics & taxonomy, Biological classification, Hierarchy of categories and higher taxa.
- Taxonomic characters: Procedures and keys.
- Species concepts: species category, subspecies and other infra-specific categories, different species concept.
- International code of Zoological Nomenclature (ICZN): operative principles, interpretation and application of important rules, formation of scientific taxa.
- Kingdoms of Life: General outline of kingdom including Monera and Protista, Broad outline and diversity in kingdom Animalia.
- Evolution: Concept of evolution and theories of organic evolution with an emphasis on Darwinism, Neo Darwinism concept.

UNIT-2  Biodiversity

- Concept and principle of biodiversity.
- Use and importance of biodiversity.
- Causes for the loss of biodiversity.
- Biodiversity conservation methods.
- Role of NGO’S in conservation activities, conservation and sustainable development.
- Endangered and threatened animal species.
- National Parks and Sanctuaries.
- Wild Life Protection Act.
UNIT-3  Cell Biology

- An overview of cell, cell shapes and types.
- Plasma membrane, Mitochondria-Structure and function.
- Cell cycle-Phases of cell cycle.

UNIT-4  General genetics

- Review of Mendelian and Non Mendelian Inheritance.
- Monohybrid and Dihybrid Inheritance, Types of dominance.
- Multiple alleles, Inheritance related to sex.
- Applications of genetics.
- Human genetics: karyotypes, genetic disorders.

UNIT-5  Economic Zoology

- Scope and importance of fish culture.
- Scope and importance of Vermiculture.
- Scope and importance of Apiculture.
- Scope and importance of Sericulture.
- Scope and importance of Pearl culture.

UNIT-6  General Parasitology

- Parasitism
- Study of parasites with reference to Morphology, Life cycle, Pathogenecity and control measures-
  
  *Pediculus humanus*
  
  *Entamoeba histolytica*
  
  *Plasmodium vivax*
  
  *Ascarts lumbricoides.*

- Immune system-innate and adaptive immunity, Applications of immunology.
UNIT-7  Ecology

- General principles of Environmental Biology with emphasis on ecosystems.
- Abiotic and biotic factors of ecosystems.
- Communities of the environment, their structure & significance.
- Energy flow in environment- ecological energetic.
- Concept of pollution- Important characteristics of Pollutants, Local and global effect of pollutants, Population increase, Production and natural resource consumption.
- Kinds of environmental pollution and their control methods.

UNIT-8  Biochemistry

- Biomolecules-Characteristic features.
- Proteins- Structure and function.
- Carbohydrates- Structure and function.
- Lipids- Structure and function.
- Nucleic acids- Structure and function.
- Enzymes-Concepts of enzyme units, classification, nomenclature, properties and functions.

UNIT-9  Tools and Techniques

- Fundamentals of optical microscopy.
- Microscopes-Types and Applications.
- Principle, Technique and Application of: pH meter, Colorimeter, Spectrophotometer, Centrifugation, Chromatography, Electrophoresis.
- Histological techniques: Principles of tissue fixation, microtomy, staining, mounting.

UNIT-10  Quantitative Biology

- Importance of statistics in Biology.
- Measures of central tendency-Mean, Mode, Median.
- Sampling types, standard error (SE), standard deviation (SD), significance Test, student t- test, Chi-square test-assumption, importance & example.

UNIT-11  Animal care and use

- Animal ethics – Introduction, concept, organizations and associated laws and issues for use of laboratory animals.
- Animal Protection Act.
- Animal care and management of laboratory animals.
- Laboratory animal models and applications.
UNIT-12 Toxicology

- Basic concepts, principles and scope.
- Toxicity testing principles, hazards, risks and their control methods.
- Various types of toxicological agents.

UNIT-13 Bioinformatics

- History, scope and bioinformatics in research.
- Bioinformatics in India- current status and future implication.

**Reference books :**

22. The Biology of biodiversity- M. Koto-Springer
24. Cell and Molecular Biology By De Robertis, EDP. And De Robertis EME, Molt Saunders Inc.
25. Cell Biology By Power, CB, Himalaya Publication House
28. Genetics By Verma, PS. And Agarwal VK., S. Chand and Co., New Delhi
29. Genetics By Gupta PK., Rastogi Publication, Meerut
38. Imm’s Text Book of Entomology, Vol I & II, Richard and Owen.
40. Bee and Bee Keeping, 1978, Roger A. Morse, Conell University Press, London.
47. Physiology of parasites – By L.S. Chapell, John, Willey & SionsN.Y. (1980).
55. Parasitology – by Chandler and Chands,
71. Methods in Enzymology all volumes.
72. Protein Purification, Principles and Practice. Scopes, R.K.
74. Enzyme by Palmer.
75. Chris Kent (2001) : Basics of Toxicology
88. Biostatics. lewis.
89. Methods in Biostatics -B.K. Mahajan
90. Mathematical Biology- J.D. Murrey
91. Wildlife in India- V.B. Saharia
92. Wildlife in central India- S.K. Tiwari
93. R.K. Tondon Biodiversity Texonomy & Ecology
94. An Introduction to prevantology- M.P. Arora
95. Biodiversity and conservation- P.C. Kotwal
103. Pearson Education (Cell & Molecular biology in action series).

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