



MADHYANCHAL
PROFESSIONAL UNIVERSITY

Syllabus

for

Ph. D in Zoology

Paper - I

Cell and its Structural organization and function of intracellular organelles: Cell membrane/wall, nucleus, mitochondria, Golgi bodies, lysosomes, endoplasmic reticulum, peroxisomes, plastids, vacuoles, chloroplast, structure & function of cytoskeleton and its role in motility.

Cell division and cell cycle; Mitosis and meiosis, their regulation, steps in cell cycle and control of cell cycle.

Biomolecules: Structure, functions, properties and their significance (protein, Carbohydrates, Lipids, Nucleic Acids and Vitamins).

Mendelian principles: Dominance, segregation, independent assortment, deviation from Mendelian inheritance and genetic variation.

Concept of gene and Genetic engineering, Alleles, multiple alleles, pseudo alleles, Cloning and Transgenics.

Principles and methods of Taxonomy: Concepts of species and hierarchical taxa, biological nomenclature, classical and quantitative methods of taxonomy of plants, animals and microorganisms.

Level of structural organization: Unicellular, colonial and multicellular forms; levels of organization of tissues, organs and systems, comparative anatomy.

Emergence of evolutionary thought: Lamarckism; Darwin-Concepts of variation, adaptation, struggle, fitness and natural selection; Mendelism; spontaneity of mutation and evolutionary synthesis.

Statistical methods: measures of central tendency and dispersal; probability distributions (Binomial, Poisson and normal), sampling distribution; difference between parametric and non-parametric statistics; confidence interval; errors; levels of significance; regression and correlation; t-test, analysis of variance; χ^2 test basic introduction to Multivariate statistics etc.

Biodiversity: Concepts, management and conservation issues and their solutions.

Ecology: Physical conditions of environment: temperature, light & water, Biogeochemical cycles; Ecosystem, concept, structure and function, Food chain and food web: Energy flow; Succession.

Fisheries Biology

Brief account of major fisheries in India and Madhya Pradesh. Freshwater and Marine fisheries.

Fisheries and Industry: Fish processing, methods of processing, fish related industries and fish product export related industries.

Fisheries Biotechnology: Fish preservation, its effects on nutritional and culinary characteristics, fish preservation and related problems and remedies.

Fish breeding and mass production: Induced breeding and transgenic breeding. Fish farming and culture.

Fisheries management and fisheries related marketing strategies.

PAPER -II

General Aptitude (GA)

Verbal Ability: English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction.

Numerical Ability: Numerical computation, numerical estimation, numerical reasoning and data interpretation.