

B. Sc. Part III- Zoology Theory

PAPER-I

A: MOLECULAR BIOLOGY AND GENETIC ENGINEERING

MOLECULAR BIOLOGY

- Eukaryotic genome organizations
- Unique and repetitive DNA sequences
- Molecular basis of gene regulation in prokaryotes; inducible, repressible systems
- Immune system
 - Cellular components of the immune system
 - Immunoglobulin
 - Major histocompatibility complex
- Somatic cell genetics
 - Heterokaryons and cell hybrids
 - Gene regulation in Heterokaryons and somatic cells

GENETIC ENGINEERING

- Scope of genetic engineering
- Restriction enzymes and their use in gene cloning
- Nucleotide sequencing, isolation and analysis of mRNA
- In vitro synthesis of recombinant DNA and gene cloning techniques
- Application of recombinant DNA technology in biology, medicine, industry and agriculture
- Potential hazards of recombinant DNA technology

PAPER- II
ECONOMIC ZOOLOGY AND ENVIRONMENTAL BIOLOGY

ECONOMIC ZOOLOGY

- Protozoa: Protozoan parasitic diseases of man and domestic animals with special reference to zoonotic significance of *Entamoeba histolytica*.
- Platyhelminthes: Life cycle and zoonotic significance of *Diphyllobothrium latum*
- Aschelminthes; Life cycle and zoonotic significance of *Dracunculus medinensis*
- Arthropoda: Life cycle and zoonotic significance of representative tick.
- Beneficial and harmful insects.
- Interrelationship of mosquito with malaria, yellow fever, dengue, encephalitis and dermatobia their prevention and control.
- Aquaculture: Basic concepts, management and economics (including Pearl Fishery)

ENVIRONMENTAL BIOLOGY

Environmental pollution

- Air Pollution

Nature of pollutants, their sources and effects on human, plants and animals and their control

- Water pollution

Sources, consequences and control

- Soil pollution

Sources, nature and harmful effects

- Deforestation and desertification, Chipko movement, deforestation and overgrazing

- Environmental hazards of radiation, General Principles of radiation biology.

▪ Toxicants and industrial effluents, Absorption, distribution and excretion of toxicants and their undesirable effects, Biological factors affecting toxicity.

- Environmental health

Water in relation to human disease, urbanization stress and health

Basic concepts of environmental monitoring.

PAPER III
DEVELOPMENTAL BIOLOGY AND ETHOLOGY

DEVELOPMENTAL BIOLOGY

Asexual reproduction

- The morphogenetic processes and the stages (blastema, blastogenesis and blastozoids).
- The kinds (fission, budding, gemmule formation).
- Comparison between blastogenesis and embryogenesis

Sexual reproduction

- Gametogenesis (spermatogenesis and oogenesis)
- Parthenogenesis

Metamorphosis

- The morphogenetic processes and causation in amphibians.
- Tissue reactivity and induction process

Regeneration

- The morphogenetic processes in regeneration
- Amphibian limb regeneration
- Histology of regeneration process (metaplasia)
- Factors influencing regeneration (stimulation, suppression)

Growth

- Concept of growth, degrowth and cell death
- Mechanism of growth
- Growth curves and their interpretation
- Type of cell growth

ETHOLOGY

Innate and learned behaviour

Imprinting and Fixed Action Patterns

Methods used in Ethological studies

Fighting behaviour

- How animals mark their territories and defend them

Social behaviour

- Advantages of being social
- How animals establish social hierarchies, communicate

Courtship displays and courtship behaviour

Nesting behaviour

- How animals construct a protective home to rear their young

Migratory behaviour of fish

Migratory behaviour of birds and navigation

