Group B **Biostatistics** **Full Marks = 25**

1. Biostatistics/Biometry: Definition and utilization in biological assays.
2. Basic Concepts of:
   a) Terminologies used in biostatistics: Variable, Population, Data, Sample estimate.
   b) Measures of Central Tendency
   c) Measures of Variation
   d) Graphical representation of data.
3. Hypothesis Testing and Student's T-test distribution.
4. Probability Distribution-Concept Probability, Binomial Distribution and Poisson Distribution
5. Simple Linear Regression and Correlation
6. Chi-Square Test.
7. Analysis of Variance.
8. Models: Definition, Classification, Usefulness.

LABORATORY COURSES

CORE 9 T **Full Marks = 25**

Biodiversity & Wildlife + Aquaculture and Fisheries Resources of India

1. Submit a report on the biodiversity study undertaken in your campus/locality/forest/river bed/sea shore 15 marks
2. Viva voce 10 marks

DCE -2P

Molecular Immunobiology and Immunogenetics (DCE2-A)

Practical **Full Marks: 25**

1. Learning basic cell culture techniques: Maintaining Cell Lines (Primary, secondary) Understanding Cellular morphology through microscopy
2. Mouse handling and studying different routes of drug administration in mouse model (oral, topical, *iv, ip, sc, in situ*)
3. Raising polyclonal antibody in mice against sheep RBC, serum collection and estimating antibody titre in serum
4. Differentiate the primary and secondary antibody response in haemagglutination test by using mercaptoethanol.
5. Separation of human lymphocytes in Hypaque Ficoll gradient

Molecular Cytology and Genetics (DCE2-B)

Practical **Full Marks: 25**

CORE COURSE II

PRINCIPLES OF ECOLOGY

THEORY **(Credits 4)**

Unit 1: Introduction to Ecology **06**

Levels of organization, Laws of limiting factors, study of physical factors

Unit 2: Population **24**

Population attributes: Density, natality, mortality, life tables, fecundity tables, survivorship curves, age ratio, sex ratio, dispersal and dispersion Exponential and logistic growth, equation and Patterns, r and k strategies

Population regulation - density-dependent and independent factors

Population interactions; Gause's Principle with laboratory and field examples, Lotka-Volterra equation for competition

Unit 3: Community **12**

Community characteristics: species richness, dominance, diversity, abundance, vertical stratification, Ecotone and edge effect; Ecological succession with one example; Theories pertaining to climax community

Unit 4: Ecosystem **14**

Types of ecosystems with example of marine ecosystem in detail; Food chain: Detritus and grazing food chains, Linear and Y-shaped food chains, Food web; Energy flow through the ecosystem; Ecological pyramids and Ecological efficiencies

Nutrient and biogeochemical cycle with example of Nitrogen cycle

Unit 5: Wildlife & Conservation **04**

Wildlife Conservation (ideas of in-situ and ex-situ conservation) Management strategies for tiger conservation; protection laws for wildlife conservation, Bio-resource assessment and planning

Practical (Credits 2)

1. Preparation of nested quardrat and estimation of effective quardrat size
2. Determination of population density in a natural/ hypothetical community by quadrat method and calculation of Sorenson's Similarity & Shannon-Weiner diversity indices for the same community
3. Study of an aquatic ecosystem: Major Phytoplankton and zooplankton (Up to Genus), temperature, turbidity/ penetration of light; determination of pH, and Dissolved Oxygen content (Winkler's method) and free CO_2
4. Estimation of Primary productivity by light & Dark bottle method
5. Report on field observations/ study at National Park/Biodiversity Park/Wild life sanctuary/Sea Shore

12. Molecular mechanism of hormone actions.

LABORATORY COURSES

CORE 1 P **Full Marks:25**

Practical: Non-Chordate and Chordate

1. Mounting of: *Paramoecium, Nyctotherus, Amoeba, Opalina*, Soil Nematodes, Gut nematode of fish and toad, *Cyclops*, *Daphnia*.
2. Submit a project report to study the diversity of Protista of pond water collected from different places.
3. Identification of Larva: Ephyra, Nauplius, Zoea, Mysis, Megalopa, Glochidium, Trocophore, Veliger, Bipinnaria. Location and extraction of pituitary gland of carp
4. Find position of accessory air-breathing organs of *Anabas* sp. / *Clarias* sp. / *Heteropneustes* sp.
5. Gallus/Columba: 5th and 7th Cranial nerves
6. *Rattus* sp. / *Mus* sp.: Nerves of the neck region

CORE 2 P **Full Marks:25**

Practical: Biochemistry& Environmental Physiology

1. Quantitation of DNA by UV-vis spectrophotometer
2. Electrophoretic separation of DNA
3. Protein estimation by Folin Lowry method.
4. Comparison of Total RBC and WBC counts in different groups of vertebrates
5. Estimation of Haemoglobin and Differential count of blood in vertebrates
6. Study of the changes of blood glucose level in a vertebrate species

CORE 3 P **Full Marks: 25**

Practical: Ecology & Behaviour

1. Water Analysis: Estimation of dissolved oxygen, free carbon dioxide; total alkalinity; total hardness and chloride
2. Soil Analysis- Estimation of percentage of calcium carbonate by rapid titration method. Estimation of organic-carbon by wet oxidation method
3. Estimation of primary productivity of aquatic ecosystems using light and dark bottle method.
4. Field Study for Assessment of density, frequency and abundance of plants/animal in a forest area, hill or sea shore using various techniques i.e. transect, quadrate etc.
5. Study the aggressive behavior of Fish (*Channa* sp. / *Betta* sp.)