BABA GHULAM SHAH BADSHAH UNIVERSITY
RAJOURI-185234, J&K, INDIA

Final Syllabus for Entrance Test to M.Sc. Programme in Environmental Sciences - 2023

Unit – I: Plant Science

- Plant kingdom: classification and characteristics of various groups: Algae, Fungi, Lichens, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms.
- Archaeobotany and ethnobotany: plant use through ages; ethnobotany and its scope.
- Economic botany: Plants as a source of Food, Fibres, Vegetable oils; Wood and timbers: general account of hard and soft woods. Spices and Condiments: source, part used and uses with particular reference to Jammu and Kashmir.
- Physiology and biochemical processes - Photosynthesis, respiration, nitrogen metabolism, protein synthesis, growth hormones, and enzymes.

Unit-II: Animal Science

- Animal kingdom: classification and characteristics of various groups: Cnidaria, Echinodermata, Chordata, Protostomia.
- Structural and functional aspects of digestive, respiratory, circulatory, muscular, excretory, reproductive, endocrine and nervous system of animals.
- Economic zoology (general account): aquaculture, composite fish culture, apiculture, sericulture, poultry farming and integrated animal farming.

Unit-III: Cell and Molecular Biology

- Structure of microbial cells; Cell constituents; Differences between eukaryotic and prokaryotic cells; Reproduction of bacteria.
- Cell biology: cell organelles, cell division, modes of reproduction.
- Principles of inheritance, epistasis, mutations, chromosomal aberrations, extra-chromosomal inheritance.
- Molecular biology: structure and functions of biomolecules. DNA structure and replication, transcription and translation, chromosome structure, protein structure, mutability and repair of DNA.
- Applications of biotechnology in medicine, industry, agriculture and environment.

Unit –IV: Environmental Chemistry

- Chemistry: Inorganic chemistry - Periodic table, s, p, d and f block elements, metallurgy, acids and bases, industrial chemistry, coordination chemistry.

- Organic chemistry - Isomerism, nomenclature, name reactions, mechanism of organic reactions, hybridization, chemical bonding, aromatic compounds, chemical synthesis and applications

- Phyto-chemistry; Environmental chemistry: concept and applications.
- Pollution: air, water, noise – definition, sources, types.
- Concept of DO, BOD, COD their effects on flora and fauna.

Unit-V: Geography and Geology

- Fundamentals, scope and relevance of Environmental Geology.
- Interaction of Lithosphere with Atmosphere, Biosphere and Hydrosphere.
- Earth's Materials. Minerals, rocks and soil.
- Economic importance of Mineral, Soil forming minerals and rocks.
- Soil conservation and erosion.
- Study of Earth interior – Crust, Mantle and core. Geo-morphological studies:
- Nature and type of land-forms.
- Natural Hazards-Earthquake, Volcano, Landslides, Floods.

Unit-VI: Ecology and Environment

- Ecosystems: structure, food chains, food webs, ecological pyramids, energy flow, biogeochemical cycles.
- Population ecology, community ecology; ecological succession and ecological adoptions.
- Biodiversity and its Conservation.
- Global Environmental issues: ozone depletion and global warming; Acid rain and Smog.
- Forest Ecosystems: characteristics of various types as per Champion and Seth's Classification, social issues related to forest environment.
- Concept and application of Remote Sensing (RS) and Geographical Information System (GIS).
- Natural Resources: Renewable and Non-renewable - Sources, Threats, Conservation and Management.