Syllabus for Entrance Test of M.Sc. (Environmental Sciences)

(Multiple choice questions from the following syllabus of graduation level)

1. **Biological sciences:** Plant and Animal kingdom-classification, characteristics of various groups, morphology, anatomy, adaptations, Ecology.

   Cell biology, molecular biology, structure and functions of biomolecules, genetics, microbiology and biotechnology.

   Physiology and biochemical processes - Photosynthesis, respiration, nitrogen metabolism, protein synthesis, growth hormones, enzymes.

   Structural and functional aspects of digestive, respiratory, circulatory, muscular, excretory, reproductive, endocrine and nervous system of animals.

   Economic botany and plant diseases.

2. **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, phytochemistry. Environmental chemistry. Recent advances in chemistry. Applications of organic compounds in daily use, fertilizers and pesticides .

   Physical chemistry – Chemical equilibrium, chemical thermodynamics, chemical kinetics, solutions, colligative properties, surface chemistry, catalysis, enzyme kinetics, nuclear chemistry.

3. **Physics**: Mechanics, gravitational force, heat and energy, nuclear physics, semi conductor, optics, electromagnetic waves, sound.

4. **Mathematics and Statistics-** Matrix, logarithms, differential and integral calculus, trigonometry, sequence and series, probability.

   Mean, mode and median, standard deviation, correlation, regression.

5. **Environmental Studies:** Natural resources- water, soil, food, energy, for minerals; biodiversity, pollution, global environmental problems, social issues related to environment

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Syllabus for Entrance Test of M.Tech. (Environmental Sciences & Engg.)

1. Physical Environment : Composition of atmosphere, Heat Budget of earth, lapse rate and vertical stability of atmosphere, origin, composition and characteristics of water, hydrological cycle, different types of rocks and their formation, soil formation, different land use patterns.

2. Ecology and Resource Conservation: Aim and scope of ecology, population ecology, community ecology, structural and functional attributes of ecosystem, ecosystem modeling, renewable and non-renewable resources and their conservation, forest and wildlife, types of Biodiversity, Threats to Biodiversity, Biodiversity conservation strategies.

3. Environmental Chemistry: Thermodynamics; Atmospheric, Soil and water Chemistry.

4. Environmental Microbiology: Characteristics of different types of microbes, Microbiology of water and soil, Role of microbes in degradation of different types of environment pollutants, Basic techniques of Genetic engineering. Environmental application of genetically modified organisms.

5. Environment Pollution and its abatement: Different types of environmental pollution and their health impacts. Strategies for abatement of different types of environmental pollution.

6. Environmental Impact Assessment and Environmental Management System: Concept of EIA, Methodologies for impact identification, prediction and evolution, Role of public participation, EIA notification (MoEF), ISO 14000. Study of natural and technological hazards, Risk Analysis.

7. Environment Awareness: Climate change, Ozone depletion, Acid rain, environmental conventions and Treaties, Environmental movements, Environmental laws.

8. Instrumentation: Principles, working and applications of various instruments used for environment analysis.

Syllabus for Entrance Test of M.Tech. (Geo Informatics)

1. **Geomorphology:** Geology, Surveying, Climatology, Soils, Topographical Maps, Map Projections, Map Reading.

2. **Physics:** Mechanics, gravitational force, heat and energy, nuclear physics, semi conductor, optics, electromagnetic waves, sound.

3. **Mathematics and Statistics-** Matrix, logarithms, differential and integral calculus, trigonometry, sequence and series, probability.

   Mean, mode and median, standard deviation, correlation, regression.

4. **Computer Science:** Basics of Computer Science, Basics of Digital Image Processing, Computer Languages.

5. **Environmental Science :** Plant and animal kingdom – Characteristics of various groups, morphology, anatomy and adaptations, Natural Resources, Water, Soil, Food, Energy, Forests, Minerals, Biodiversity, pollution, global environmental problems, social issues related to environment.

6. **Remote Sensing and GIS:** Principles and applications of Remote Sensing and GIS, Satellites, Space orbits, Electro-Magnetic-Spectrum (EMR), Satellite Sensors.