

**SVURPGCET-2012: SYLLABUS**  
**Test No: 14 ENVIRONMENTAL SCIENCE**

**SECTION - A**

**Environmental Studies:** Definition, scope and its importance.

**Renewable and non-renewable-** resources - Natural resources and associated problems-Forest resources-Water resources - Mineral resources-Food resources - Energy resources - Land resources - Conservation of natural resources - use of resources for sustainable lifestyles.

**Ecosystems :** Concept - Structure and function of an ecosystem-Producers, consumers and decomposers - Energy flow in the ecosystem- Ecological succession - Food chains, food webs and ecological pyramids. Characteristic features and functions of Forest ecosystem, Grassland ecosystem, Desert ecosystem and Aquatic ecosystems.

**SECTION - B**

**Biodiversity and its Conservation:** Introduction - Definition-Biogeographical classification of India - Value of biodiversity - Biodiversity at global, National and local levels - India as a mega -diversity nation - Hot-spots of biodiversity - Threats to biodiversity-Endangered and endemic species of India - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

**Environmental Pollution:** Definition - Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution - Nuclear hazards.

**Solid Waste Management:** Causes, effects and control measures of urban and industrial wastes.

**Disaster Management:** floods, earthquake, cyclones and landslides.

**SECTION - C**

**Theory of Quantitative Analysis, Principles of Volumetric Analysis:** Introduction, Standard solution, indicators, end point, titration error, titration curves,

Type of titration- (I) Neutralization titrations-Principle,titration curves and selection of indicators-strong acid - strong base, pH indicators (ii) Redox titrations-Principles,detection of endpoint, redox indicators (iii) Precipitation titrations - Principle detection of endpoint, indicators, titration curve (iv) Complexation titrations-Principle, metal ion indicators. Principles of Gravimetric analysis - Nucleation, precipitate - Co-precipitation and post-precipitation.

**Non-aqueous Solvents:** Classification and characteristics of a solvent. Reactions in liquid ammonia physical properties, auto - ionisation, examples of amino acids and amino bases. Reactions taking place in liquid ammonia-precipitation, neutralization, solvolysis, solvation-solutions of metals in ammonia, complex formation, redox reactions. Reactions in HF- autoionisation, reactions taking place in HF - precipitation, acid-base reactions, protonation.

**Solutions:** Liquid-liquid - ideal liquid mixtures, Raoult's and Henry's law.Non-ideal systems. Azeotropes - HCL-H<sub>2</sub>O, ethanol-water systems.Fractional distillation. Partially miscible liquids - phenol- water, trimethyl amine-water, nicotine-water systems, Lower and upper consolute temperature. Effect of impurity on consolute temperature. Immiscible liquids and steam distillation.

**Bioinorganic Chemistry:** Essential and trace elements, Biological significance of Na, K, Mg, Cu, Zn, Cr, Mn, Co, Ni and Ca and C1-1 Toxicity of As, Hg and Pb. Metalloporphyrins with emphasis on hemoglobin - structure and function. Chlorophyll-structure and role in photosynthesis.

**Photochemistry:** Interaction of radiation with matter, difference between thermal and photochemistry: Grotthuss - Draper law, Stark - Einstein law, Quantum Yield, photochemical combinations of hydrogen-chlorine and hydrogen bromine. Joblonski diagram depicting various processes occurring in the excited state,qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing), photosensitized reactions-energy transfer processes (simple examples).