P.G. Department of Environmental Science

***Syllabus for the Entrance Examination for admission to the M. Phil. Programme in Environmental Science*-2010**

Note:- The question paper shall comprise of two parts :

Part (I) Subjective part containing Six questions of which Four questions must be attempted (40 Marks);

Part (II) Multiple choice objective part containing 30 questions and all are to be attempted (30 Marks).

Unit I. Fundamentals of Environmental Science

1.1. Origin, evolution and structure of earth

1.2. Components of Environment: atmosphere, hydrosphere, lithosphere and biosphere

1.3. Climate of India

1.4. Soil types and land use patterns

Unit II. Environmental Chemistry

2.1. Analytical Chemistry: Stoichiometry, titrimetry and gravimetry

2.2. Instrumentation Techniques: Spectrophotometry, flame photometry and chromatography

2.3. Thermochemical and photochemical reactions in the atmosphere

2.4. Limnochemistry, thermal phenomena in lakes and carbonate system

Unit III. Environmental Biology

3.1. Ecosystem: structure and function

3.2. Population interactions

3.3. Biodiversity: types, threats and conservation

3.4. Endemism and floral and faunal peculiarities of J & K.

Unit IV. Natural Resources

4.1. Water and mineral resources of India

4.2. Forest resources of India: timber and non-timber

4.3. Energy resources: renewable and non-renewable

4.4. Glacier and hydro-power resources of the Himalaya

Unit V. Environmental Geo-science

5.1. Energy budget of the earth
5.2. Natural disasters
5.3. Marine zones and Marine resources
5.4. Biogeochemical cycles – Carbon, Nitrogen, Phosphorous and Sulphur

Unit VI. Environmental Toxicology

6.1. Dose-response relationship and factors affecting the environmental concentration of toxicants
6.2. Xenobiotics and Toxicity testing methods
6.3. Toxicants as Public Health Hazard: pesticides, fertilizers, heavy metals & radioactive substances
6.4. Biomagnification and biotransformation of xenobiotics

Unit VII. Environmental Pollution and its Control – I (Air, Noise and Radioactive Pollution)

7.1. Primary and secondary air pollutants and their behavior in atmosphere
7.2. Control of gaseous and particulate air pollutants
7.3. Noise pollution – sources, impacts and control
7.4. Thermal and radioactive pollution

Unit VIII. Environmental pollution and its Control – II (Land and Water pollution)

8.1. Soil degradation
8.2. Sustainable agricultural practices
8.3. Eutrophication: causes, consequences and control
8.4. Wetland: classification, conservation

Unit IX. Environmental Microbiology

9.1. Interactions between microbes and environment
9.2. Nature and function of micro-organisms in Soil, Water and Air
9.3. Air, soil and water-borne diseases
9.4. Immunological diseases

Unit X. Environmental Laws

10.1. International efforts for Environment protection.
10.2. National Laws: The Environmental (protection) Act,1986; and Wildlife Protection Act, 1972
10.3. Hazardous Waste Management And Handling Rules, 1989
10.4. Intellectual Property rights and Eco-Mark

Unit XI. Environmental Impact Assessment

11.1. Environment impact assessment – concept and approaches
11.2. EIA methodologies
11.3. EIA Case Studies: River Valley, Thermal and Mining Projects
11.4. Ecotourism
11.5. Environmental and Land use planning.

Unit XII. Environmental Statistics and Computer Application

12.1. Measurement of Central tendency and dispersion
12.2. Ecological Models: Lotka–Volterra model, Leslie matrix model and Gaussian plume model
12.3. Computer hardware and software
12.4. Information and Communication technology

Unit XIII. Remote Sensing, GIS and Environmental Auditing

13.1. Spectral reflectance of soil, vegetation and water
13.2. Applications of Remote Sensing in environmental impact analysis
13.3. GIS components and data models
13.4. Principles and guidelines of Environmental Auditing

Unit XIV. Man and Environment

14.1. Environmental psychology and current problems
14.2. Urbanisation and impact on development
14.3. Environmental education: Aims, objectives and approaches
14.4. Cost – benefit analysis of Environmental projects

Unit XV. Environmental Engineering

15.1. Environmental sanitation
15.2. Methods of purification of drinking water
15.3. Natural methods of sewage disposal and wastewater treatment
15.4. Bio-filters and control of air pollution

Unit XVI. Resource Management and Sustainable Development

16.1. Sustainable development: Concept and strategies
16.2. Conservation of plants and animals: in-situ and ex-situ conservation
16.3. Management of solid wastes
16.4. Biotechnology in pollution control and Bioremedies
16.5. Plant tissue culture – Concept, importance and methodology.

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