Environmental Sciences, Centre for Biodiversity Studies, BGSB University, Rajouri, J&K

Syllabus and Sample Question Paper for Entrance Test for Admission to Ph. D in Environmental Sciences– 2026

1. Environmental Chemistry and Ecotoxicology

Atmospheric chemistry, Chemistry of water, Chemistry of toxicants, Concept of ecotoxicology, Routes and kinetics of toxicant uptake, Biological indicators of toxicants, Bioaccumulation, Biomagnification and Biotransformation.

2. Basics of Earth Sciences and Climatology

Interior of Earth, Geomorphological processes, Geomorphological systems, Climatology: basics and temperature distribution, atmospheric pressure and wind systems, climatic classification and weather forecasting, major climates of the world, applied climatology.

3. Concepts of Ecology and Ecosystem

Introduction to ecology and ecosystem, Bio-geochemical cycle and productivity, Principles of limiting factors, Biotic community-Principles and concepts, dynamics, Population regulation structure and interaction.

4. Remote Sensing and GIS

Introduction to remote sensing and RS systems, Aerial photography and photogrammetry, Microwave and thermal remote sensing, Image interpretation, Geographical information system (GIS) and global positioning system (GPS).

5. Aquatic Environment

Aquatic environment: basics, lentic environment- lakes and wetlands, lotic environment-streams and rivers, groundwater hydrology, estuarine and marine environment.

6. Environmental Impact Assessment and Management

Basic concepts of environmental impact assessment, prediction and assessment of impacts on water environment, air environment, noise environment, socio-economic and cultural environment, biological environment, life cycle assessment, eco labelling, environmental auditing, sustainable development, environmental education, ecotourism, land use planning, watershed management, rainwater harvesting, wasteland reclamation.

7. Environmental Pollution

Air pollution, noise pollution, terrestrial pollution, thermal pollution, water pollution, Oil Spills, Groundwater contamination, Eutrophication, environmental pollution control technologies.

8. Environmental Microbiology and Contaminant Remediation

Microbial environment, food microbiology, industrial microbiology, Bioremediation- overview and processes involved, bioremediation technologies, Bioaugmentation, phytotechnologies for contaminant remediation

9. Climate Change: Science and Policies

Understanding climate change, climate change: vulnerabilities and impacts, limiting climate change: adaptation and mitigation, UNFCCC policy, Global climate change and National and Internal Policies and Concerns, Global Carbon Market (CDM, JI, IET), Carbon Footprint and Ecological Footprint.

10. Natural Resources: Conservation and Management

Forest resources, soil and minerals, wildlife and wildlife habitats, status and distribution of wildlife in India, natural resources conservation strategies and management. Concept of Ecosystem Services and Nature Based Solutions.

11. Environmental Law

Introduction to environmental laws, pollution abatement and law, environment protection and law, laws pertaining to natural resource conservation, environmental protection rules and judicial activism

12. Environmental Biotechnology

Role of environmental biotechnology for pollution control, wastewater treatment systems, bio-fuels, bio-insecticides, biotechnology for re-forestation, bio-techniques for air pollution abatement, biofertilizers, vermi-technology, bio-plastics.

13. Disaster Management

Disaster: introduction, disaster management cycle, man-made disasters, biological disasters, chemical disasters, nuclear disasters, desertification, natural disasters (earthquake, volcanic eruptions, landslides, snow avalanches, cyclones, floods, drought, heat and cold

waves, tsunami). disaster response, risk and vulnerability assessment, disaster preparedness, disaster mitigation, recovery.

14. Environmental Health Hazards & Sanitation

Environment and health, determinants of health, health education and health situation in India, disease transmission, environmental hazards with reference to occupational hazards, communicable diseases (diarrhoea and dysentery, cholera, typhoid, tuberculosis, nosocomial infections, zoonotic infections).

15. Research Methodology

a. Basic Statistics

Computation of Mean and Standard Deviation, Z-test, t-test (testing the significance of population mean, difference between two mean and paired t-test), classification), Analysis of Variance (Two way classification), Principles of experimental design (CRD & RBD)

b. Instrumentation for Environmental Analysis

Principles, Construction and Applications of light microscopy, Principles, Construction and Applications of Spectrophotometry, Principles, Construction and Applications of Atomic Absorption Spectrophotometer, Principles, Construction and Applications of HPLC, Principles, Construction and Applications of Gas Chromatography.

c. Environmental Monitoring -I

Principles and applications of remote sensing, Principles and applications of Geographical Information System (GIS), Methods for quantification of phytodiversity and diversity indices, EIA methodologies, Isolation of microorganisms from environmental samples

d. Environmental Monitoring - II

Sampling and Analysis of physical, chemical and biological parameters of water, sedimentation, coagulation, filtration and Redox potential, Measurement of Noise and Indices, Water Quality Standard and Index

Q 1. Penalty for Conservation of the provisions of the Forest Act is under?

A. Section 3 A.
B. Section 4 A.
C. Section 8 A
D. Section 12 A

Q 2. Dimercaprol is useful as an antidote for poisoning by:

A. Chromium, Nickel
B. Magnesium and Manganese
C. Iron and Cobalt
D. Lead, Arsenic and Mercury

Q 3. Which of the following sensor is not used in the remote sensing satellite?

A. Electromagnetic sensor
B. Acoustic sensor
C. Thermal sensor
D. Biosensor

Q 4. Globally, the average carbon footprint for a person is:

A. 4 tons.
B. 8 tons.
C. 10 tons.
D. 12 tons.

Q 5. Incineration of municipal solid waste releases one of the following toxic material of significant concern to the environment:

A. HCl gas
B. Dioxins
C. Heptachlor
D. Methyl mercury

(Coordinator)