

# **Nalanda Open University**

Course Name: M.A. / M.Sc. Environmental Science

Co-Ordinator: Prof. (Dr.) Bihari Singh

Mobile No. : +91 9546452116, +91 9334331422

E-mail ID : [bihari\\_singh2001@yahoo.com](mailto:bihari_singh2001@yahoo.com)

## **E-CONTENT**

for

M.A. / M.Sc. Environmental Science,

Part-1 Students

**Session – 2019 – 2021**

(For exammines of M.A. / M.Sc. Environmental Science,

Part – 1, Examination, 2020; Theory Papers)

Important topics suggested to be prepared for Annual Examination, 2020

## **THEORY PAPER**

### **PAPER – I**

#### **(FUNDAMENTALS OF ENVIRONMENTAL SCIENCE & ECOLOGY)**

1. Introductory remarks on Environment and Environmental Science. Description of factors which influence Environment.
2. Description of the structure and composition of Atmosphere.
3. Energy sources and their flow in an ecosystem.
4. Origin and classification of Lakes. Description of transport phenomenon of fresh water bodies.
5. Introductory description of the terms Ecology, Autecology and Synecology.
6. Definition and types of Ecosystem with suitable examples.
7. Descriptive notes on Tropical levels, Food Chain and Food web.
8. Introduction of Biogeochemical Cycle. Description of at least two gaseous and one sedimentary biogeochemical cycles.
9. Detailed description of Forest ecosystem, Grassland Ecosystem and Marine ecosystem.
10. Meaning of Community; Origin, Structure and Organization of Bio-Community.
11. Brief description of Population Ecology and Law of Population Growth.
12. Explanatory notes on Biome, Ecological Succession, Second law of thermodynamics, Primary and Secondary Productivity.

**THEORY PAPER**  
**PAPER – II**  
**(ENVIRONMENTAL GEO-SCIENCE)**

1. Critical examination of either the Hypothesis of Laplace or the Hypothesis of Kant regarding the origin of the solar system.
2. Discussion on different views expressed regarding the internal layers of the earth.
3. Classification of rocks of the Lithosphere and explanation regarding the mode of their formation.
4. Description of sources of salinity in the ocean water.
5. Distinction between:
  - i. Troposphere and Stratosphere
  - ii. Absolute and Relative Humidity.
  - iii. Tropical and Extra-tropical Cyclone.
  - iv. Cumulus cloud and Stratus cloud.
6. Theories regarding evolution of life in biosphere.
7. Heat budget of the atmosphere; Thermal structure of the atmosphere.
8. Distinction between Weather and Climate. Discussion on factors affecting seasons.
9. Definition of Biomes; Description of the biomes of tropical region/temperate region.
10. Different theories regarding the origin of Indian Monsoon.
11. Discussion on the statement that Earthquakes and Volcanic eruptions are a natural and geological hazard.
12. Description of Global Warming. Its cause and effects on human health and Environment.
13. Common Air Pollutants : particulate matter and such gaseous air pollutants as Ozone, Oxides of Sulphur and Oxides of Nitrogen.
14. Essential Trace Elements; their natural sources and the abnormalities caused due to their deficiencies.

**THEORY PAPER**  
**PAPER – III**  
**(ENVIRONMENTAL CHEMISTRY)**

1. Meaning and definition of “Strength of Solution”. Different methods for expressing strength of solutions.
2. Elaboration of the statement that “Oxygen plays” a key role in the troposphere, while Ozone in the stratosphere.
3. Green House Gases and Green House Effect. Consequences of increasing Green House Effect.

4. Sea water as a source of drinking water in future. Description of effective and efficient methods for conversion of sea water into portable water.
5. Bio monitoring – Meaning and importance.  
Bio-indicators – Bio-indicator groups and examples.
6. Soil: Definition, Different components of Soil, Physical and Chemical properties of Soil.
7. (a). Acidic Soil : How is this soil formed? Reclamation of acidic soil for agriculture.  
(b). Alkaline Soil : How is this soil formed? Reclamation of alkaline soil for agriculture.
8. Essential Plants Nutrients: Their role in nutrition and their deficiency symptoms in plants (Emphasis on deficiency symptoms of Nitrogen, Potassium, Phosphorous, Zinc and Iron).
9. Toxic Chemical in Biosphere: Common method of classification of toxic chemicals. Meaning of Threshold Limiting Value (TLV): Threshold Limiting Value of some common toxic metals.
10. An introduction of Synthetic Pesticides; Brief description of harmful effects of synthetic pesticides on humans and other life forms.
11. Dissolve Oxygen (DO), Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) as important parameters to assess the quality of water.
12. About
  - i. Montreal Protocol, 1987 and
  - ii. Kyoto Protocol, 1997Critical assessment of outcome of these protocols.

**THEORY PAPER  
PAPER – IV**

**(BIODIVERSITY, ITS CONSERVATION & MICROBIOLOGY)**

1. Introductory note and definition of Biodiversity, value of Biodiversity. Important economic commodities that human derive from Biodiversity.
2. Description of status of India on the scale of Mega Biodiversity.
3. Major reasons for loss of Biodiversity, different methods of conservation of Biodiversity.
4. Endemism, Endemic and Endangered species of India.
5. International Biodiversity conventions, Assessment of International efforts under various biodiversity conventions for protection, promotion and conservation of biodiversity.
6. Growth of history of Microbiology, scope and importance of Microbiology.
7. Role of microbes in fighting the menace of pollution.

8. Introductory note on Biogeochemical Cycles. Detailed description of Hydrological Cycle, Phosphorus Cycle and Nitrogen Cycle.
9. Introductory note on Biofertilizers, benefits of using Biofertilizers, precaution during application of Biofertilizers.
10. Microbial interactions, Short description of Synergism and Mutualism. Diseases caused in plants by parasitic microorganisms.
11. Few instances of People Wildlife Conflict. Measures to mitigate such conflicts.
12. Short notes on
  - Vermicomposting
  - Fermentation Technology and
  - IUCN-Red list.

## **THEORY PAPER**

### **PAPER – V**

#### **(NATURAL RESOURCES AND THEIR CONSERVATION)**

1. Natural resources – Introduction and Definition. Salient features of Natural Resources.
2. Forest resources : Type of Forest in India and their spatial pattern.
3. Meaning of Deforestation, main causes behind the large scale destruction of forest areas in modern times, Afforestation as an essential measure to conserve forests.
4. Importance of water resources for human beings.
5. Various types and sources of water resources.
6. Meaning of biotic resource. Importance of livestock resource of India.
7. Reserves, distribution, production and related problems of fisheries in India.
8. Importance of soil, brief description of problems of soil and measures of its conservation.
9. Classification of Energy Sources. Importance of energy sources in economic progress of a nation.
10. Need of Energy Conservation and measures taken in this regard.
11. Mineral resources of India, needs and methods of conservation of mineral resources.
12. Types, Distribution and Utilization of Marine resources. Effect of the utilization of marine resources on the environment.
13. Meaning of equitable use of Natural resources. Role of various components in the conservation of natural resources.

NOTE: SHORT DESCRIPTION OF THE SUGGESTED TOPICS WILL BE UPLOADED IN THE SECOND ROUND OF UPLOADING OF E-CONTENTS.