

**MA (P) Environmental Education
Syllabus 2013-14**

PAPER – 1: BASIC CONCEPT OF ECOLOGY

Max. Marks: 80+20 (Internal Assessment)

Time: 3 hours

Note:-

Nine questions will be set in all.

Question No.1, which will be objective/short answer type covering the entire syllabus, will be compulsory.

The remaining eight questions will be set unit-wise with two questions from each Unit I, II, III and IV.

The candidates will be required to attempt Q.No.1 and four others, selecting one question from each unit. All the questions carry equal marks.

UNIT –I

Basic Concepts: Definition, scope and significance of Ecology; Concept of biosphere, atmosphere, lithosphere and hydrosphere; components of atmosphere; concept of habitat and ecological niche.

Factors affecting environment: Abiotic factors–light (intensity, quality and duration), temperature, humidity, topography, edaphic factors; biotic factors–microorganisms, plant, man and other animals.

UNIT-II

Laws of limiting factors; Shelford's law of tolerance and Leibig's law of minimum.

Autoecology and synecology: concept, distribution and regeneration of species.

Ecosystem : concept, types of ecosystem, components, properties and functions.

UNIT –III

Ecological energetic and energy flow–food chain, food web, trophic structure; concept of productivity–primary, secondary, gross and net.

Biogeochemical cycles: Concept, reservoir pool, exchangeable pool, hydrological cycle, gaseous cycles and sedimentary cycles, effect of pollution on biogeochemical cycles.

UNIT-IV

Biomes: Concept; major biomes of the world; forest, desert and grasslands of India.

Development and evolution of ecosystem: Succession – definition, causes and types (hydrosere, lithosere): primary and secondary succession; concept of climax.

PAPER II: POPULATION AND COMMUNITY ECOLOGY

Max. Marks: 80+20 (Internal Assessment)

Time: 3 hours

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UNIT-I

Population and its characteristics: Concept of population, population density and indices of relative abundance, basic concept regarding rates, natality, mortality, life tables; population age distribution, population dispersion, intrinsic rate of natural increase and concept of carrying capacity, growth forms, population fluctuations and cyclic oscillations.

UNIT-II

Human populations: National and International concern; world population structure and problems associated with it; Indian efforts to control the growing population.

Population regulation: Density Independent and density dependent factors in population control.

Biological invasion: Concepts, reasons, dimensions and consequences; invasion of plants and animals in India and its impact on environment; population dispersal.

UNIT III

Population interactions: Neutralism; positive interactions—commensalism, proto cooperation, mutualism and symbiosis; negative interactions—competition, predation, parasitism, antibiotics and allelopathy; importance of negative interactions.

Community ecology: Concept of community and its characteristics; concept of ecological dominance, species composition. Species diversity in communities.

UNIT IV

Weed ecology: Concept, impact of weeds in agro ecosystem, forest, grassland and urban ecosystems; intrinsic and extrinsic factors affecting weed population density and spread; menace of *Parthenium* in India

Concept of ecotypes, ecotones and edge effect.

PAPER III ENVIRONMENTAL POLLUTION AND SOURCES OF ENERGY

Max. Marks: 80+20 (Internal Assessment)

Time: 3 hours

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UNIT-I

Evolution, structure and composition of atmosphere; natural components of air and their resources – biological, geochemical and atmospheric.

Air Pollution: sources and types of air pollutants: primary and secondary pollutants; urban air pollution; emissions from automobiles; classical smog, photochemical smog; effect of air pollution on health of man and sensitive areas.

Biochemical aspects of CO, O₃, PAN, Benzene and metals.

Pollution management techniques.

UNIT-II

Water pollution : Major kinds of water uses – domestic, agricultural, instream and industrial; water pollutants; tolerance limits; effects of water pollution; waste water treatments; possible control measures.

Other pollution: Soil pollution, noise pollution, electronic pollution, indoor pollution, marine pollution; biological pollutants, biosocial pollutants, plastic and other chemical pollutants.

UNIT-III

Solid waste management: Primary waste products – solid waste, toxic – biological and hospital wastes; methods of waste disposal – landfills, incineration, source reduction and recycling.

Toxic chemicals hazards: Toxic chemicals and metals, petrochemicals, pesticides, radiations and bio –toxins; movements of toxics through air, water and soil, their ecological effects;

UNIT-IV

Sources of energy: Renewable energy, non renewable energy sources and techniques of energy conservation; Management and conservation of natural energy resources; priority requirements of conservations at national and international level.

Ecological Impact Assessment: Concept and significance; methods of assessment.

PAPER IV: MAJOR NATIONAL AND GLOBAL ENVIRONMENTAL ISSUES

Max. Marks: 80+20 (Internal Assessment)

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UNIT-I

Protection of Environment: International concerns and efforts for environmental protection; role of United Nations; Stockholm summit; priority issues; Rio Summit: Sustainable Development; Earth day; Environment day; ecotourism.

Ozone depletion: Ozone as friend and foe; phenomenon, reasons and possible effects on plants, animal and man; measures to check depletion of ozone layer.

Global warming and climate change: Reasons, possible effects and measures to combat the problem.

UNIT-II

Biodiversity: Concept, types and significance of biodiversity: conservations strategies; preservation of genetic diversity; global concerns and efforts; national resources conservation policy Forests: Major forest biomes of the world. Significance of the tropical forests; forest conservations–Indian effort

UNIT –III

Wildlife : Distribution in India enlistment of various zones and their characteristics and current practices in conservation of wildlife; ecosystem approach, species based approach, in situ and ex situ conservation in threatened animal and plant species; wildlife damage: problems and management; electric fences and chemicals immobilization.

Protected area network: Concept, categories and management objectives; present status of national systems; scenario of protected areas in India; theory and practices of biosphere reserves, national parks and sanctuaries.

UNIT- IV

Special projects for endangered species: Project tiger, Project Gir lion, Project elephant, Project hangul and Project crocodile.

Environmental laws: Indian and international laws.

Environmental education: Need, problems and solutions at national and international levels environmental ethics.

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PAPER V: ENVIRONMENTAL IMPACTS AND EDUCATION

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UNIT-I

Ecosystem: Concept; relationship between ecosystem, organisms and environment. Factors that control cycling of elements in terrestrial ecosystem; natural Vs artificial ecosystem; interaction between biotic and abiotic process (positive and negative feedback).

Energy Flow in ecosystem: Sun as source of energy, nature of its radiation, heat budget of earth, earth's temperature and atmosphere, Energy flow models.

UNIT-II

Major Biomes of the world: Concept of biomes, Terrestrial biomes: Grasslands, Desserts, Forests. Aquatic biomes: fresh water biomes (Lentic and Lotic), Marine Biomes. Sustainable forest management.

Remote Sensing and its application in Ecology.

UNIT -III

Standards for Environmental Quality Assessment and Monitoring: Environmental protection standards in India, International Standards for Environmental Protection, Environmental Quality Monitoring: ISO 14000, ISO 14000 – impact on developing countries.

Environmental Impact Assessment (EIA): Origin and development, Development and environment appraisal process in India, EIA – purpose, aim, values, Principal and process, environment components of EIA, Main participants of EIA process, impact identification methods.

UNIT- IV

Environmental Audit: Introduction: Definition; types of auditing, Features of Effective Auditing, Programme planning and organization of Auditing Programme, Pre visit data collection, Auditing Protocol, Onsite Audit; Data Sampling; Inspection and Evaluation and Presentation, Audit Report; Action plan, Management of Audit, Benefits of Environmental Audit, Environmental Audit Programme in India

PAPER VI: NATURAL RESOURCES

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Max. Marks: 80+20 (Internal Assessment)

Time: 3 hours

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I, II, III and IV.

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UNIT – I

Introduction to natural resources and their consumption patterns. Types of natural Resources: renewable and non-renewable resources and their limitations. Supply and demand of natural resources.

Minerals resources: Their use, Mining and Sustainability.

Land Resources: Land as a resource, Land degradation, Man induced landslides, Soil erosion and Desertification.

UNIT – II

Forest Resources: Use and over-exploitation, Deforestation and timber extract, Dams and their effect on forest and tribal people.

Animal Resources: Utility of animal resources in agriculture, transport and food.

Food Resources: World food problems, Changes caused by agriculture and overgrazing, Effect of modern agriculture; Fertilizer-pesticide problems, Water logging; Salinity.

UNIT – III

Energy Resources: Non renewable energy resource: pattern of consumption, issues and options.

Fossil fuels: reserves of coal, its classification and basic geology.

Types of renewable energy source and their environmental significance. Sustainable development of energy resources.

UNIT – IV

Environmental impact of coal mining, Reserves of oil and gas, basic geology, environmental impact of their production and consumption, Nuclear Energy its resources, Nuclear power plants, Nuclear waste disposal. Geothermal energy: water dominated and vapour dominated systems. Global Energy source: An overview. Global energy consumption and energy conservation. Techniques of Energy conservation. Indian programmes of renewable energy.

PAPER VII: WILDLIFE AND ITS CONSERVATION

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UNIT-I

Wildlife: Distribution and current status in India, Enlistments of various Zones and their characteristics. Inter-relationship between forest and Wild life conservation. Role of Zoological and Botanical garden in conservation.

UNIT-II

Current practices of conservation (World and in India): World Conservation strategies and conservation of biological diversity, Establishment of representatives network of protected area, Management of protected area and habitat restoration. Application of Remote sensing and GIS in habitat characterization.

UNIT -III

Scientific management of wildlife and role of research in, In situ and Ex situ- conservation of threatened animals and plants. Wildlife education and interpretation, research and monitoring. National and international conservation organization and their role.

Wildlife census: Planning a wildlife census, sample counts, block counts, roadside counts, dung counts, Pug mark census, and water hole census. Wildlife tourism.

UNIT IV

Restorations of endangered species and role of WWF, IUCN, UNEP, Red Data Book.

Wildlife legislations in India: Wild Life Protection Act. Principles and procedure for enforcement of wildlife laws. Control of illegal trade in Wildlife, Wildlife forensics and its application as a tool in support of enforcement of wildlife law.

PAPER VIII: WATER RESOURCES AND THEIR MANAGEMENT

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UNIT-I

Historic perspectives on water use and development. The Hydrological Cycle, Climate and weather. Water Resources: Glaciers, surface and subsurface water, Marine water, Impact of changing environment on water resources, anthropogenic impacts.

Water Resources and Economic development.

UNIT-II

Water quality, parameters and resources management: Water use and consequences of ground water withdrawn, impact of agriculture on ground water tables, confined and unconfined aquifers, Salt water, Local, State & Central water management agencies.

Water Quality & Ecology: Water, Fish and Wildlife.

UNIT –III

Water society: Water available and demand, Flood hazards and hydrology, flood hazard planning and protection, Dams and reservoir, droughts.

Water Conservation, Rain water Harvesting and watershed management, ground water recharge.

UNIT IV

Water Resources and Politics: Water use and conflicts, Politics of water scarcity, Interlinking of river system, Trans boundary and interstate disputes (Satluj Yamuna Link Canal dispute; Cauvery water allocation dispute, The Indus water treaty).

Social issues; Water and modern city, emerging water issues. Water allocation/conservation / pollutions laws.