

AMCT08 ENVIRONMENTAL SCIENCE AND ENGINEERING

UNIT-1 ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY

- 1.1 Definition, scope and importance of environment- need for public awareness - concept of an ecosystem- structure and function of an ecosystem- producers, consumers and decomposers - energy flow in the ecosystem- ecological succession- food chains, food webs and ecological pyramids
- 1.2 Introduction, types, characteristic features, structure and function of the
- 1.3 (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)
- 1.4 Introduction to biodiversity definition: genetic, species and ecosystem diversity- biogeographical classification of India- value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option- values
- 1.5 Biodiversity at global, national and local levels- India as a mega-diversity nation- hotspots of biodiversity- threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife- conflicts- endangered and endemic species of India- conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.
- 1.6 Field study of common plants, insects, birds,
- 1.7 Field study of simple ecosystems- pond, river, and hill slopes, etc.

UNIT-2 ENVIRONMENTAL POLLUTION

- 2.1 Definition- causes, effects and control measures of:
- 2.2 (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards
- 2.3 soil waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution
- 2.4 Pollution case studies- disaster management: floods, earthquake, cyclone and landslides.
- 2.5 Field study of local polluted site- Urban / Rural / Industrial / Agricultural.

UNIT-3 NATURAL RESOURCES

- 3.1 Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people
- 3.2 Water resources: Use and overutilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems
- 3.3 Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources,
- 3.4 Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity,
- 3.5 Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.
- 3.6 Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification- role of an individual in conservation of natural resources
- 3.7 Equitable use of resources for sustainable lifestyles.

3.8 Field study of local area to document environmental assets- river / forest / grassland / hill / mountain.

UNIT-4 SOCIAL ISSUES AND THE ENVIRONMENT

- 4.1 From unsustainable to sustainable development- urban problems related to energy- water conservation, rain water harvesting, watershed management- resettlement and rehabilitation of people; its problems and concerns,
- 4.2 Role of non-governmental organization- environmental ethics:
- 4.3 Issues and possible solutions- climate change, global warming, acid rain, and ozone layer depletion, nuclear accidents and holocaust,
- 4.4 Wasteland reclamation- consumerism and waste products- environment production act
- 4.5 Air (Prevention and Control of Pollution) act- Water (Prevention and control of Pollution) act
- 4.6 Wildlife protection act- Forest conservation act- enforcement machinery involved in environmental legislation- central and state pollution control boards- Public awareness.

UNIT-5 HUMAN POPULATION AND THE ENVIRONMENT

- 5.1 Population growth, variation among nations- population explosion- family welfare Programme- environment and human health- human rights- value education
- 5.2 HIV / AIDS- women and child welfare – role of information technology in environment and human health

Reference Books:

1. R.K. Trivedi, 'Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards', Vol. I and II, Enviro Media.
2. Cunningham, W.P. Cooper, T.H. Gorhani, 'Environmental Encyclopedia', Jaico Publ., House, Mumbai, 2001.
3. Dharmendra S. Sengar, 'Environmental law', prentice hall of India Pvt Ltd, New Delhi, 2007.