

ENVIRONMENTAL STUDIES

UNIT I - ECOSYSTEM

Ecosystem - Producer, consumer and decomposer, **Ecological pyramids** - Food chain and food web, Ecological pyramids, **Flow of energy** - Flow of energy, Energy flow in the ecosystem, **Bio geochemical cycle** - Bio geochemical cycle, Oxygen and nitrogen cycle, Carbon cycle, Water cycle, Phosphorus cycle, Sulphur cycle, **Bio accumulation and biomagnification** - Bio accumulation and biomagnification, **Ecosystem value** - Ecosystem value.

UNIT II - NATURAL RESOURCES

Living and non living resources - Natural resources, Living and non living resources, **Water resources** - Water resources, Uses of water, Conflicts over water, Dams – Benefits and problems, Over utilization of surface and ground water, **Flood and droughts** - Flood, Drought, **Mineral resources** - Mineral resources, Classification of mineral resources, **Environmental effects of extracting and using mineral resources** - Environmental effects of extracting and using mineral resources, Impacts of mining, Case studies - Mineral resources, **Land resources** - Land resources, Soil erosion and desertification, Role of an individual in the conservation of natural resources, **Forest resources** - Forest resources, Uses of forests, Over exploitation of forest resources, Deforestation, Effects of deforestation, Forest management, **Case studies - Forest resources** - Timber extraction and mining, Dams and their effects on forests and tribal people, Case studies, **Energy resources** - Energy resources, Growing energy needs, Non-renewable sources, Renewable sources, Solar energy, Nuclear energy, Hydel energy, Wind energy, Tidal energy, Geothermal energy, Case studies – Energy sources.

UNIT III - BIODIVERSITY AND BIOTIC RESOURCES

Biodiversity - Biodiversity, Value of biodiversity, **India is mega diversity nations** - India is mega diversity nations, **Hot spots of biodiversity** - Hot spots of biodiversity, Threats to biodiversity, Conservation of biodiversity, **National biodiversity act** - National biodiversity act.

UNIT IV - ENVIRONMENTAL POLLUTION AND CONTROL TECHNOLOGIES

Environmental pollution - Environmental pollution, Introduction to air pollution, Air pollution, Sources of air pollution, **Classification of air pollutants** - Classification of air pollutants, Smog, Photochemical smog, **Causes and effect of air pollution** - Causes of air pollution, Effect of air pollution, **Automobile and industrial pollution** - Automobile pollution, Effect of automobile pollutants, Control of automobile pollution, Industrial pollution, Causes of industrial pollution, Effects of industrial pollution, **Sampling of ambient air and analysis of air pollutants** - Ambient air sampling, Collection of gaseous air pollutants, Collection of particulate pollutants, Stack sampling, Particulate sampling, Gaseous sampling, Analysis of air pollutants, **Water pollution** - Introduction to water pollution, Sources of water pollution,



Classification of water pollutants, Waste water characterization, Absorption of heavy metals, Methods of control of water pollution, Drinking water quality standard, **Soil pollution** - Soil pollution, Sources or causes of soil pollution, Effects of soil pollution, Control of soil pollution, **Environmental impacts of modern agriculture** - Environmental impacts of modern agriculture, Changes caused by agriculture and overgrazing, Degradation of soil, **Noise pollution** - Noise pollution, Source of noise pollution, Effects of noise pollution, Prevention and control of noise pollution, Noise standards, **Solid waste** - Solid waste management, Classification of solid waste based on properties, Sources of solid wastes, Effects of solid wastes, Management of solid waste, Process of solid waste management, Pyrolysis and composting, **E – Waste Management** - E –waste, Composition of e-waste, Treatment and disposal of e-waste, E-waste management, **Waste water treatment methods** - Preliminary treatment, Primary treatment, Secondary treatment, Tertiary treatment, **Overview of air pollution control technologies** - Control of particles and gaseous emission, Air pollution controls by vegetation, Air pollution controls by stacks, Air pollution controlling devices, Gravity settling chamber, Cyclone separators, Fabric filters, Wet collection devices, Cyclonic scrubbers, Venturi scrubbers, **Concepts of bioremediation** - Bioremediation, Microbial population for bioremediation processes, **Climate change and impacts on human environment** - Climate change and impacts on human environment, Ozone depletion, Ozone Depleting Substances, **Deforestation and desertification** - Deforestation, Effect of deforestation, Desertification, **International conventions/protocols** - Earth summit, Kyoto protocol, Montreal protocol.

UNIT V - ENVIRONMENTAL POLICY, LEGISLATION AND EIA

Environmental legislation and laws - The environment (protection) act, 1986 , The environment (protection) act, 1986, Power of central government to take measures to protect and improve environment, Appointment of officers and their powers and functions, Salient features of environmental protection act, Air pollution laws, Standards, Air pollution act 1981, Water pollution laws, Water (prevention and control of pollution) act, 1974, Functions of state pollution control board, Wildlife (Protection) Act, 1972, Forest (Conservation) Act, 1980, **Municipal solid waste management and handling rules** - Management of solid waste, Management of solid waste, Control measures of urban and industrial wastes, Process of solid waste management, Pyrolysis and composting, **Biomedical waste management and handling rules** - Biomedical waste management and handling rules, **Hazardous waste management and handling rules** - Hazardous waste, Hazardous waste classification, Hazardous waste management, Treatment method, Chemical treatment, Biological treatment, Thermal treatment, Solidification and stabilization, Disposal methods, The hazardous wastes rules, **Environmental impact assessment** - Environmental impact assessment, Various stages of EIA, **Overview on impact of air, water , biological and social economical aspects** - Overview on impact of air, water, biological and social economical aspects, Strategies for risk assessment, **Concepts of environmental management plan** - Concepts of environmental management plan, **Concept of sustainable development** - Concept of sustainable development, **Population and its explosion** - Population, Population growth, Impacts of population growth (or) Consequences of population growth, Variation of population among nations, Causes and effect of population explosion, Crazy consumerism,

Environmental education - Environmental education, Value education, Significance (or) importance of value education, Types of values, **Environmental ethics** - Environment and human health, Urban Sprawl, Environmental ethics, Concept of green building, **Ecological foot print, LCA and Low carbon life style** - Ecological foot print, Life cycle Assessment, Low carbon life style.