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Forestry & Enviromental Science Syllabus for Uttarakhand State Civil Services Main Exam-2011

FORESTRY & ENVIROMENTAL SCIENCE

PAPER-I

SECTION A - Forestry

1.Dendrology : Families of forestry importance general account and floral structure of Gymnosperms- Genetals, Coniferals and Taxales Angiosperms-salicacear, Myricaceae, Juglandaceae, Retulaceae, Fagaceae, Ulmaceae, Moraceae, Magnoliaceae, Laauranceae, Rosaceae, Leguminosae, Rutaceae, Meliaceae, Anacardiaceae, Acceraceae, Hippocastanceaceae, Rhamnaceae, Tiliaceae, Ericaceae, Oleaceae, Sapindaceae, Dipterocarpaceae, Bambocaceae, Euphorbiaceae, Palman.

2.Silviculture: Defination of Silviculture and the object of its study. Definition of forest & Forestry-its scope and classification. Relation of silviculture with forestry and its branches. Need for conservation of existing forests and creation of new forest in India.

Ecology of Indian Forests-factors determining forest types, climatic factors, solar radiation, light and temperature as factor of locality, Factors determining the temperature as the basic of classification of vegetation. Effects of wind, dew, atmospheric humidity and evaporation on forest vegetation. Topographic factors, Edaphic factors, Biotic factors. Grazing lands-advantages and disadvantages. Classification of forest types: definition, objective and various type of classification. Important forest types of India.

3. Silviculture of Trees:

Group A:

1. Pinus roxburghii (Pine) 2. Cedrus deodara (Deodar) 3. Abies pindrow (Silver fir) 4. Pinus gerardiana.

Group B:

1. Tectona grandis (Teak) 2. Eucalyptus 3. Santalum album (Sandal) 4. Bamboo 5. Populus- spp. 6. Dalbergia sissoo.

Group C:

1. Quercus leucotrichophora 2. Anegeissus lattifolia (Dhaura) 3. Adina cordifolia (Haldu) 4. Bombax ceiba (Semal)

4. Forest Mensuration: Introduction, Defination and conventions, units of measurement and standards of accuracy implied in their expression. Measurement of diameter and girth: concept of Breast Height, measurement of diameter/girth under different conditions, Measurement of height of trees: Study of increment of trees, Form of trees, Measurement of trees in field and their out turn, measurement of (a) stem, round and sawn wood (b) crown, branch and root wood (c) bark and chorcoal. Sample plot; definition, objects and kind of objects and methods, measurement of volume of standing trees and forest crops.

5. Plantation Forestry: Seed source and seeding establishment: Biology of tree seeding establishment. Nursery management: Soil aspects of nursery management. Site preparation: Selection of site, consideration of site suitability. Tending of plantation: Stand growth an yield; need for pruning, thinning regimes for important plantation species. Failure of Plantations: Reasons for failure and remedial techniques. Afforestations of inhospitable sites: drought prone, arid, marshy, saline, sandy sites, etc.

SECTION B-Environment Sciences

1. Environment: Definition, Components: Atmosphere, Hydrosphere, Lithosphere, Biosphere. Structure, composition and interaction of environmental components. Concept of Biosphere-2.

2. Environmental Movement: Genesis and evolution of Environmental movements. Environmental Awareness and Public Participation. The Chipko Movement. Silent Valley Movement. Appiko Movement, Narmada Bachao Andolan, Tehri Dam Conflict.

3. Ecosystem: Concept, structure, component. Abiotic and biotic variables. Ecosystem function, trophic levels, energy, flow, food chain, food web. Ecosystem homeostasis. Examples of Ecosystems (pond, lake, river, forest and mountain).

4. Chemical Composition of Air: Stratospheric chemistry-Ozone Oxygen and Ozone chemistry, Catalytic decomposition processes of Ozone. Tropospheric Chemistry-Smog Chemistry of air pollutants photochemical smog. Atmospheric aerosols.

5. Toxic Chemical in the Environment (Air and Water): Xenobiotic compounds-detergents, pesticides, pesticides, plastics. Biochemical aspect of Arsenic, Cadmium, Mecury, Carbon monoxide. Pollution: Air Pollution. Water Pollution, Noise and Radioactive Pollution.

PAPER-II
SECTION A- Forestry

1. Forest Ecology and Biodiversity: Forest Ecology-Ecosystem Ecology, Ecology & ecosystem concepts, genetic & evolutionary aspects of ecosystems, population ecology, community ecology. Application of ecological information in the management of forest ecosystems. Renewability of natural resources and implication for forest management.

Biodiversity: concept and types; biodiversity monitoring & measurements. Bio-geographic region of Indian; biodiversity status: Global and Indian scenario; Factors causing degradation and loss of biodiversity, conservation.

2. Mycology and Forest Pathology: Economic importance, morphology, reproduction, characteristic and classification of fungi belonging to different groups with special reference to pathogenic forms of forest trees. Symptoms and classification of plant diseases.

General principles of plant pathology. Non infectious disorders of forest trees. Diseasaes caused by phanerogemic plant parasite lime Dendrophthoe, Acanthobium, Lorenthus etc. Major forest, disease caused by fungi in forest nurseries, plantations and natural forest. Disease caused by viruses and micoplasmal organisms, Timber decay and its protection Epidemiology.

Management of forest diseases. General principles of diseases control and management, fungicides and fumigants, their application, plant quarantine.

3. Forest Entomology : Importance of entomology in forestry with special reference to economic losses. General organization of external structure of an insect. Insect damage and sign categories.

Classification of major groups of insects (Coleoptera, Lepidoptera, Hemiptera, Isoptera, Orthoptera, Hymnoptera, Diptera) upto order and family.Insect-feeding groups-defoliating, sapsucking and mites, Terminal, shoot, twing and root, insects, Seed and cone insects, boring insects, gall makers, concepts of integrated pest management population dynamics of forest insects.

4. Wild Life Management : People and wildlife-values of wildlife. Unique wild life of India, rare and threatened animals, red data book, agencies involved in wild life conservation, causes for extinction of wild animals, wild life protection act, national parks, sanctuaries, game reserves, closed areas; famous birds sanctuaries, project tiger, biological basis of wild life management. Management for preserving natural diversity.

5. Social and Agroforestry: Social forestry: concept scope and objectives types of social forestry, mass involement and role of extension in social forestry. Agroforestry: agroforestry system classifications, socio-economic and ecological aspects of agroforestry management of trees in agroforestry, diagnosis and design technique, Multipurpose trees in agro forestry tree crop interactions, soil productivity aspects of agroforestry, economic aspect of agroforestry.

6. Forest Policy and Legislation: Definition-necessity of forest policy, Indian forest policy, Indian forest policies of 1894, 1952 and 1988; Reports of the National Comission on Agriculture and different aspects of forests. Forest law: Legal definiton of various terms used in Indian Forest Act. (a) Constitution of reserved forest as in Chapter-II of IFA (1927).

SECTION B-Environment Sciences

Natural Resources (With special reference to Uttaranchal): Forest resorurces and their management. Water resources and their management. Wildlife resources and their management. Land resources and their management.

Biodiversity and its Conservation : Definition of biodiversity. Hotspots of biodiversity. Strategies for biodiversity conservation. Biodiversity Convention.

Environmental Protection : Provision of environmental protection in Indian Constitution (Article 48A and 51A). Environmental Protection Act 1986. Wildlife Protection Act 1972 amended 1991. Forest Conservation Act 1980 and amended upto date. The Water (Prevention & Control of Pollution) Act 1974 and amended uptodate. Air(Prevention & Control of Pollution) Act 1981 and amended upto date. Biodiversity Conservation Bill. Ecomark.

Environmental Monitoring: Aims and objectives of environmental monitoring. Global Environmental Monitoring System (GEMS). National Monitoring Programmes. Bioindicators. El-Nino and ENSO.

Remote Sensing: Definition, history & evalution. Electromagnetic radiations. Interaction between EMR and atmosphere. Platforms and Sensors. Thermal Remote Sensing. Microwave Remote Sensing.

Energy Use Pattern: Energy use pattern in India. Energy use pattern in mountainous rural areas (Uttaranchal).Environmental implications of energy use.

Conventional Energy Resources: Fossil fuels-classification, composition and physico-chemical characters. Energy contents of coal, petroleum and natural gas. Hydro energy- Mega/Micro hydel Projects, hydroenergy management in Uttaranchal.

Non Conventional Energy Resources: Solar Energy: Solar Collectors, photovoltaics, solar ponds. Wind Energy. Bioenergy; Energy from biomass & biogas. Tidal Energy. Nuclear Energy (Prospects and retrospects).

Global Environmental Problems: Ozone Layer Depletion. Global Warming (Green House Effect). Acid Rains. Deforestation. Desertification, Climate Change.

Current Environmental Issues in India: Mega Dams and Environment (Tehri dam, Narmada dam, Almetti dam). Wasteland and their reclamation. Formation and reclamation of Usar, Alkaline and saline soils. Vehicular pollution and Urban Air Quality. Water Crisis.