SYLLABUS FOR THE INDIAN FOREST SERVICE PROBATIONERS

FINAL EXAMINATION

ELEMENTARY BIOLOGY

Theory:

Botany:

Morphology–classification of plant kingdom; parts of an angiospermic plant, the seed, germination, root, stem - their functions and modification; the leaf, inflorescence, flower and fruit. Histology - the cell, the tissues, cell division, histology of stems, root and leaf. Secondary growth, Physiology- absorption, and conduction of water and mineral salts, metabolism-photosynthesis, respiration, nitrogen fixation and reproduction. Tree Genetics-genetics and its application to plant improvement.

Zoology:

Classification of animal kingdom–economic importance and distinguishing features of different classes.

Practical: Laboratory work and excursions.

ELEMENTARY MATHEMATICS

Fundamentals of algebra, arithmetic, geometry, trigonometry, Mensuration, use of logarithms-graphs and introductory calculus.

STATISTICS

Role of statistics and definitions, Organization of data and its representation, Measures of central tendency, Measures of dispersion, Frequency distributions. Regression and Correlation. Simple examples of fitting of curves-least square method, Analysis of variance, Statistical inference-estimation and testing of hypothesis, Enumeration and sampling.

ECONOMICS

Basic concepts of economics, Features of traditional and modern economy, Micro and macro-economics, Forestry sector, relevance of economics to forestry, The law of scarcity, society's production possibility frontier and its uses, national income and product, Concept of demand, utility, supply, price and related laws, Factors affecting supply of forest products, production theory as applied to forestry; production function, marginal physical product theory of a single firm. Market-main features, different forms, types of competition, cost and revenue, various concepts, cost of production, marginal cost and marginal revenue, Determination of rent, interest and wages.

FOREST ECOLOGY

Basic principles and concepts, forest ecology and Silviculture, Ecological succession, plant formations, classification and ordination of communities, Ecological/environmental/site factors, Effect of vegetation/forests on environment, Measurement of environmental factors, Pollution, Autecology, ecological adaptations and population ecology.

The ecosystem: The concept, components and its functions. Forest ecosystems, production ecology/forest productivity: concept, phytogeographical and zoogeographical ecology: salient features of Indian flora and fauna, regions of the world/India. Classification of Indian vegetation. Eco-botanical regions of India. Classification of forest types with emphasis on Champion and Seth’s classification.

GEOLOGY AND SOIL SCIENCE

Geology theory:

Topography and geomorphology as related to the forest. Rocks, minerals and fossils. Geological structures and their topographic expressions. Phytogeology in Indian context. Mineral constituents of various rocks and their effect on soil properties. Parent materials leading to different types of soils.
Soil Science Theory:

Physicochemical and biological properties of forest soil, classification and survey of forest soils. Improvement of problem soils.

Practicals

Geology–Identification of important rocks, minerals and fossils, simple geological maps and their reading.

Soil Science–Analysis in laboratory, study and description of forest soil profile. Collection of soils samples and analysis of important physico–chemical properties.

FOREST MENSURATION


Field exercises.

OVERVIEW OF FORESTRY–NATIONAL AND GLOBAL

Forest and forestry, history of management of forests, development of systems of forest management in recent years, emerging trends. Forest geography of the world - factors influencing the distribution of forest, critical analysis of forest resources, forest policies, wood based industries, forestry practices, forestry research and training. Trade patterns in forest products. International organizations related to forestry. Congresses, Commissions, Conferences and Conventions relevant to forestry on global basis. World forestry literature (periodicals, journals, etc) with display.

COMPUTER AWARENESS


SOIL CONSERVATION AND LAND MANAGEMENT


Grazing and Fodder Management–Cattle and their fodder requirements. Grass lands in India-distribution, management & improvement and carrying capacity. Fodder resources of India, forest grazing and its management.

Watershed and its Management–Water resources of India. Watershed-definition, classification and characteristics. Watershed management planning–preparation and analysis or integrated watershed management project.

Field Study: Preparation of an integrated watershed development project for a micro-watershed.

SILVICULTURAL PRACTICES

Definition, Role of forests, Silviculture-foundation and practices. Regeneration: Natural and Artificial-object, principles, methods and alternatives. Basic principles of nursery and afforestation techniques, recent techniques of production and out planting of bare root & container seedlings, afforestation in problem sites, energy plantations, urban forestry, planning, costing & records of regeneration operations.

Silviculture of Indian tree-General description-dealing with distribution, phenology, growth characteristics, autecology, synecology, community environment, regeneration methods of Indian species of economic importance.

Demonstration and Field Exercises- Seed quality testing, nursery operations, regeneration techniques of important species and site treatment.
SILVICULTURAL SYSTEMS


SYSTEMATIC BOTANY

Theory

Plant Nomenclature: Importance, brief history, taxonomy, classification systems.

Angiosperms: Origin and life history. Principles and systems of classification. Modern trends in taxonomy. Systematic Botany of Indian forest plants following Bentham and Hooker System. Their distribution, field characters and economic importance. Salient features of following families:

- Magnoliaceae, Dipterocarpaceae, Meliaceae, Sterculiaceae, Leguminosae, Rosaceae, Lythraceae, Myrtaceae, Rhizophoraceae, Rubiaceae, Lauraceae, Anachardiaceae, Cupuliferae, Verbenaceae, Euphorbiaceae, Gramineae and Coniferae.

Ethnobotany and its importance in forest and protected area management.

Practicals

Floral parts, dissection and characteristics of one specimen each of 15 families with identification of species.

FOREST BIOMETRY


FOREST MANAGEMENT


FOREST SURVEY

Theory:


Practicals:

Drawing equipments and their uses. Practice of survey methods–chain, compass and plane table. Use of compass and map reading, computation of areas.

FOREST ENGINEERING

Theory:

Building construction, Quality of materials, specification & field checks. Preparation of estimate of a building, requirement of building material for construction, plinth area and cube rate estimates, analysis of rates, foundation design for load bearing walls. Forest roads - classification, geometric design, alignment and earth work estimation. Design of retaining wall and construction etc. Bridges - types of forest bridges with span upto 6 m, wooden bridges, small culverts.

Water harvesting structures for soil conservation works - check dams, anicuts, spill ways, design of river training works etc.
Practicals:

- Drawing: Plan, elevation and section of buildings, check-dams, wooden bridge with span up to 6 m, estimating earth work from longitudinal section.

Field exercises:

- Alignment of fair weather truckable forest hill road. Reconnaissance survey, preliminary survey etc. Preparation of longitudinal sections, cross sections, site plan and estimating earth work etc.

Forest Harvesting and Wood Based Industries

Theory:

- Definition, scope, terminology. Basic logging hand tools and power chain saws-operation and maintenance. Felling operations, dragging, transporting-various methods and equipments. Loss in process. Management of departmental harvesting. Investment decisions and planning-road design, work study and costing of operations. Marketing.


Practicals:


Non-Wood Forest Produce

Theory:

- Introduction, different types of Non-Wood Forest Products (NWFP)- their changing role, availability, collection, processing, marketing and pricing. Credit, financing, training and extension on institutionalizing cultivation. Protection of biodiversity and conservation of genepool of Non-Wood Forest Produce.

Wood Technology

Theory:

- Wood anatomy, scope, structure, physical features and strength properties of wood, evaluation of defects & abnormalities for various uses. Wood seasoning, preservation-concepts and practices, other improvement techniques of timber utilization.

Practicals:

- Identification of timbers with key for 20 important timbers. Wood seasoning and wood preservation.

Biodiversity Conservation and Wildlife Management


Forest Protection

FOREST POLICY & LAW

Forest Policy:


Forest Law:

Legal definitions, application of penal code to forests, general principles of criminal law, legal principles of punishment, criminal procedure code, the law of evidence and the Indian Evidence Act, 1872 as applied to forestry matters.


ADVANCED FOREST MANAGEMENT


GENERAL MANAGEMENT


ENVIRONMENTAL CONSERVATION


COMPUTER APPLICATION IN FORESTRY


Introduction to Geographical Information System Package (GIS); Remote Sensing; project management system (PRISM); sensitivity and regression analysis; operation research package; expert system; data communication and networking (LAN). District Information System (DISNIC). Computer aided working plan exercise; MIS development.

REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEMS IN FORESTRY

Theory:

Basic principles, types and scope of remote sensing. Introduction to aerial photography and photo grammetry. Measurements from aerial photographs, photo-interpretation. Area determination and forest mapping. Use of aerial photographs in forest inventory and management. Introduction to various types of satellites and sensors–resolution and form of data available. Acquisition and interpretation of satellite data for forestry purpose. Thematic mapping, vegetation mapping. GIS and its use in Forest Management.

Practicals

Stereoscopic vision test, interpretation and measurements on aerial photographs, transference of details to base map. Vegetation mapping work. Identifying the objects. Digital and visual interpretation of satellite image. Field application of GIS.
SPECIAL PAPER

PEOPLE AND FOREST

Forest in rural development–Forests-People symbiotic linkage; Forests and tribals, forests and employment generation, forest dwellers-their tradition of forest conservation, rights and concession. People's participation in forest management-concept to commissioning and review. Management of local community action, forest management strategy-social forestry programmes & Joint Forest Management programme (JFM). Various strategies, micro level planning & participatory rural appraisal. Monitoring and evaluation of JFM. Behavioural dimensions in people centered forest management. Forestry extension-communication, extension work; programme planning & methods. Management of extension organization.

EXERCISES AND TOURS


2. **Road Alignment Exercises:** Alignment, mapping and estimation of forest motor road through a hilly country.

3. **Integrated Watershed Management:** Selection of macro and micro watershed, data collection, socio-economic survey, formulation of an integrated watershed development project comprising various sectoral development plans.

4. **Tours :-**
   (i) **Introductory Tour:** Familiarization with Forest and Forestry operation, field Botany, Forest Management, Study of Wildlife, Study of Forest Administrative and Management units. Locality factors, Silviculture, utilization, forest terminology.
   (ii) **Hill Tour:** Study of working plans and management of conifers and temperate broad-leaved species, introduction of exotics, mechanized logging, stem analysis, stump analysis, increment boring, sample plot lay out, enumeration.
   (iii) **West India Tour:** Soil Conservation, grazing and fodder management, ravine reclamation, combating desertification, social forestry and other silvicultural practices for other problem sites.
   (iv) **South India Tour:** Study of Working Plans and Management of teak, Bamboo, deciduous species, evergreen species; thinning research; utilization methods including visits to wood-based industries, industrial plantations.
   (v) **East India Tour:** Study of ecological succession, natural and artificial regeneration, tending mechanized plantations of fast growing species, yield and volume tables, forest types, taungya technique, afforestation techniques in various types of areas, study of mangrove eco-system.

QUALIFYING TESTS

i. **First Aid:** The probationers shall be trained and tested in civil defence, First Aid and St. John’s Ambulance Drill.

ii. **Weapon Training:** The probationers shall be trained and tested in the use of light machine gun, rifles, pistols, and revolvers.

iii. **Equitation Training:** shall include the walk, trot, canter.

iv. **Regional Language:** the test shall comprise of translation, free composition, set composition, conversation and dictation. The probationer’s knowledge of grammar shall be tested chiefly by composition, conversation and passage for comment.

v. **Hindi:** The test shall comprise of translation, free composition, set composition, conversation and dictation. The probationer’s knowledge of grammar shall be tested chiefly by composition, conversation and passage for comment.

vi. **Motor Mechanics:** Petrol and diesel engines; four stroke and two stroke engines; fuel system; ignition system; lubrication system; transmission system; cooling system; fault detection and daily checks.
vii. **Forest Administration and Account:** (a) Introduction, need, organizational set up, types of administrative and management units and their set up, management information system in forest department, inter-departmental coordination, forest manuals. (b) Generally accepted accounting principles. Convention and concept, Cash Book and other subsidiary registers maintained in division and range offices. Analysis of check and post-check, budget and grant, power of sanction, appropriation and reconciliation, issue of cheques, payments, muster-roll, measurement book, forest advances, advance of contractors.

Forest Corporation: Analysis of balance sheet and profit and loss account, ratio analysis and fund flow analysis.

viii. **Swimming:** The standard of training and proficiency shall be determined by the Director.

7. In the said regulations, in the Second Schedule.

(a) For the brackets, words and figures “ (See Regulation 5 (2))” the brackets, words and figures “ (See Regulation 5)” shall be substituted;

(b) For the entry “Nagamees in roman script” occurring in the Second column relating to regional language, against the cadre of Nagaland, the entry “AO, Augami Sema or Lothai” shall be substituted.

**EXPLANATORY MEMORANDUM**

It has been decided to introduce the new pattern for training of the Indian Forest Service Probationers from the year 1994. Many of the probationers have already joined the Indira Gandhi National Forest Academy, Dehradun and are undergoing training as per the revised syllabus.

It is certified that the no officer would be adversely affected by amendment to the Indian Forest Service (Probationer's Final Examination) Regulation, 1968 being given retrospective effect.
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**Total Lecture:** 1418