

SYLLABUS

CERTIFICATE IN FORESTRY FOR FOREST GUARDS TRAINEES (Course of Six Months Duration)

AT

**FOREST AND WILDLIFE TRAINING
SCHOOL MIANI @ HYDERABAD**



**SINDH FOREST DEPARTMENT
GOVERNMENT OF SINDH**

2019

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PREPARED BY:
SHAHID HUSSAIN RAJPUT
Lecturer / Range Forest Officer
Forest & Wildlife Training School Miani

SUPERVISED BY:
ZUBAIR AHMED CHANNAR
Principle / Divisional Forest Officer
Forest & Wildlife Training School Miani

SINDH FOREST DEPARTMENT
GOVERNMENT OF SINDH

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1. FOREST LAW

1. PAKISTAN FOREST ACT.1927 Chapter No. I to XIII
2. SINDH WILDLIFE PROTECTION ORDINANCE 1972
3. CATTLE TRESS PASS ACT 1871
4. PROCEDURE OF BOOKING OFFENCE
5. FILLING IN OF PRELIMINARY OFFENCES / DAMAGE REPORT
6. COMPOUNDING & PROSECUTION OF FOREST CASES
7. CHECK; ISSUE OF PERMITS & CHALLAN

2. GENERAL SILVICULTURE

1. CONCEPT AND IMPORTANCE OF FORESTS:

- 1.1. Factors Constituting The Environmental Complex and Their Influence on The Forest:
 - 1.1.1. Soil
 - 1.1.2. Topography
 - 1.1.3. Water
 - 1.1.4. Temperature
 - 1.1.5. Light
 - 1.1.6. Atmosphere
 - 1.1.7. Biotic Factors
 - 1.1.8. Fire
- 1.2. Effect of Forest on Environment
- 1.3. Definition and Scope of Silviculture

2. TREE MORPHOLOGY:

- 2.1. Root Forms
- 2.2. Mycorrhiza
- 2.3. Crown Forms
- 2.4. Forms of Bole
- 2.5. Development of Straight and Clear Bole
- 2.6. Bole Defects Due To Inheritance and External Causes
- 2.7. Epicormic Branches.

3. CROP MORPHOLOGY:

- 3.1. Forest Stand

- 3.2. Evenaged and Un-Evenaged Forest Stands
 - 3.2.1. Characteristics
 - 3.2.2. Comparative Advantages and Disadvantages
- 3.3. Pure and Mixed Forests
 - 3.3.1. Characteristics
 - 3.3.2. Merits
- 3.4. Crown Closure
 - 3.4.1. Importance
 - 3.4.2. Influence on Stand's Life

4. TREE REPRODUCTION:

- 4.1. Flowering Habits of Trees
- 4.2. Periodicity
- 4.3. Seed Dormancy
- 4.4. Pre-Sowing Seed Treatments
- 4.5. Vegetative Re-Production
 - 4.5.1. Shoot Cutting
 - 4.5.2. Root Cutting
 - 4.5.3. Root-Shoot Cutting
 - 4.5.4. Layering

5. AFORESTATION & RE-GENERATION

- 5.1. Definition
- 5.2. Importance and Types
- 5.3. Natural Regeneration
- 5.4. Factors Affecting Natural Regeneration
- 5.5. Natural Regeneration under Various Silvicultural Systems.
- 5.6. Control of Mixtures
- 5.7. Assessment of Regeneration and Aids to Natural Regeneration
- 5.8. Economics of Natural Regeneration.

6. FUNCTIONS OF FORESTS:

- 6.1. Productive Functions of Forests
- 6.2. Protective Functions of Forests
- 6.3. Bio-Esthetic Functions of Forests
- 6.4. Ecological Function of Forests
- 6.5. Employment in Forestry

7. REGENERATION

- 1.1 Definition
- 1.2 Types of Regeneration
 - 1.2.1 Natural Regeneration
 - 1.2.2 Artificial Regeneration

8. SEEDS:

- 8.1 Collection
- 8.2 Extraction
- 8.3 Storage
- 8.4 Testing for Purity
- 8.5 Viability
- 8.6 Germination Percent.

9. NURSERY:

- 8.7 Objectives
- 8.8 Types
- 8.9 Selection of Sites
- 8.10 Size
- 8.11 Layout
- 8.12 Beds
- 8.13 Pot Irrigation and Drainage

10. MAINTENANCE AND IMPROVEMENT OF FORESTS:

- 8.14 Natural Forests and Irrigated Plantations
- 8.15 Cultural and Subsidiary Operations:
 - 8.15.1 Weeding
 - 8.15.2 Climber Cutting
 - 8.15.3 Cleaning
 - 8.15.4 Thinning
 - 8.15.5 Under Planting
 - 8.15.6 Restocking
 - 8.15.7 Fencing
 - 8.15.8 Marking of Standards
 - 8.15.9 Planting
 - 8.15.10 Grafting
 - 8.15.11 Draining of Water Logged Areas
 - 8.15.12 Tree Guards.

3. FOREST BOTANY

1. INTRODUCTION

- 1.1. Definition of Botany and Biology.
- 1.2. Introduction to Different Branches of the Subject.

2. SEED

- 2.1. Definition
- 2.2. Different Kinds of Seeds
- 2.3. Morphology and Structure of Various Types of Seeds
- 2.4. Seed Germination.
- 2.5. Disposal of Seed.

3. ROOTS

- 3.1. Definition
- 3.2. Kinds of Roots

4. STEMS

- 4.1. Definition
- 4.2. Kinds of Stems

5. FLOWERS& FRUITS

- 5.1. Parts of Flowers
- 5.2. Inflorescence
- 5.3. Fruit

6. HISTOLOGY:

- 6.1. Cell
- 6.2. Plant Cell
- 6.3. Brief Introduction of Cell Structure
- 6.4. Role of Protoplasm
- 6.5. Function of Internal Organelles of Cell
- 6.6. Cell Division
- 6.7. Tissue
- 6.8. Internal Structure of Root
- 6.9. Internal Structure of Stem
- 6.10. Internal Structure of Leaf

7. PHYSIOLOGY:

- 7.1. Absorption of Water and Mineral Salts Mechanism.
- 7.2. Photosynthesis; Description and Its Importance.
- 7.3. Respiration and Metabolism. Aerobic and Anaerobic Mechanism.
- 7.4. Comparison between Photosynthesis and Respiration.
- 7.5. Development (Growth) In Plants.
- 7.6. Factors affecting the Growth.
- 7.7. Reproduction in Flowering Plants.
- 7.8. Movement in Plants

8. REPRODUCTION:

- 7.9. Sexual Reproduction
- 7.10. Asexual (Vegetative)

9. CLASSIFICATION:

- 9.1 Classification of Plants:
 - 9.1.1 Angiosperms & Gymnosperms
 - 9.1.2 Dicotyledonous
 - 9.1.3 Monocotyledonous
 - 9.1.4 Phanerogams&Cryptogams,
- 9.2 Binomial Nomenclature
- 9.3 Family
- 9.4 Brief Introduction of Families of Forest Species:
 - 9.4.1 Pinnaceae
 - 9.4.2 Fabacea
 - 9.4.3 Myrtaceae
 - 9.4.4 Oleaceae
 - 9.4.5 Leguminosae

**FOREST BOTANY
(PRACTICAL)**

1. SEEDS:

- 1.1. Types of Seed
 - 1.1.1. Dicot Seeds
 - 1.1.2. Monocot Seeds
- 1.2. Various Parts of Seeds.
 - 1.2.1. Dicot Seeds
 - 1.2.2. Monocot Seeds

2. LEAF:

- 2.1. Arrangement of Leaves on Stem
- 2.2. Simple and Compound Leaves
- 2.3. Various Modifications of Leaves.

3. STEM:

- 3.1. Modifications of Stems.
- 3.2. Aerial and Underground Stem
- 3.3. Rhizomes
- 3.4. Corms
- 3.5. Tubers
- 3.6. Bulbs

4. ROOT:

- 4.1. Modifications of Roots.
- 4.2. Various Forms of Roots

5. INFLORESCENCE:

- 5.1. Types of Inflorescence
- 5.2. Racemose Type
- 5.3. Cymose Type

6. FLOWER:

- 6.1. Simple Description of Various Parts of Flowers.

7. FRUIT:

- 7.1. Types of Fruits
 - 7.1.1. Dry Fruits
 - 7.1.2. Succulent Fruits
 - 7.1.3. Examples of Various Types of Fruits.

8 MAJOR FAMILIES OF PLANTS:

8.1 Identification and Description of Various Families of Plants

8.2 Typical Examples from Forest Species.

9 BOTANICAL SPECIMEN:

9.1 Identification

9.2 Collection

9.3 Preservation

4. FOREST UTILIZATION

1. INTRODUCTION:

1.1 Definition of Forest Utilization

1.2 Scope of the Subject.

2. FELLING AND CONVERSION:

2.1 Different Methods of Felling and Conversion of Timber.

2.2 Marking List

2.3 Season For Felling

2.4 Types and Description of Different Implements Used

2.4.1 Hand Saw

2.4.2 Mechanical Sawing

2.5 Important Factors in Felling and Conversion

2.5.1 Species

2.5.2 Use of Timber

2.5.3 Terrain

2.5.4 Measurement and Record of Timber Conversion

3. GRADING AND STORAGE OF TIMBER:

3.1 Grading of Railway Sleepers

3.2 Storage of Logs and Timber

3.3 Different Methods of Stacking

3.3.1 Advantage

3.3.2 Disadvantages.

3.4 Measures for Protection of Timber in Depots.

4. EXTRACTION AND TRANSPORT:

- 4.1 Different Methods of Extraction and Transport of Timber in Different Forest areas of Pakistan.
- 4.2 Various Types of Equipment Used
- 4.3 Location and Construction of Extraction Paths and Roads for Short and Long Distance Haulage.
- 4.4 Choice of Method
- 4.5 Improvements in Extraction of Forest Produce.

5. ORGANIZATION OF LABOUR IN FORESTS:

- 5.1 Organization and Control of Labour Employed
 - 5.1.1 Felling
 - 5.1.2 Extraction
 - 5.1.3 Transport
- 5.2 Disposal of Timber and Other Forest Produce
- 5.3 Basis and Control of Job Assignment

6. MINOR FOREST PRODUCE.

- 6.1 DEFINITION
- 6.2 IMPORTANCE OF MINOR FOREST PRODUCTS
- 6.3 KINDS AND SOURCES OF MINOR FOREST PRODUCE:
 - 6.3.1 Fibers and Flosses
 - 6.3.2 Grasses
 - 6.3.3 Bamboos
 - 6.3.4 Canes
 - 6.3.5 Oil Seeds
 - 6.3.6 Tans
 - 6.3.7 Dyes
 - 6.3.8 Gums
 - 6.3.9 Resin Tapping
 - 6.3.10 Manufacturing of Turpentine
 - 6.3.11 Charcoal Manufacturing
- 6.4 DISTILLATION AND EXTRACTION
- 6.5 MODERN INDUSTRIAL USES OF MINOR FOREST PRODUCE.
- 6.6 STRUCTURE OF WOOD:
- 6.7 DEFECTS IN WOOD.

- 6.8 WOOD SEASONING
- 6.9 WOOD PRESERVATION:
- 6.10 USES OF WOOD:

5. FOREST SURVEY

FOREST SURVEYING:

1. INTRODUCTION:

- 1.1 Definition And Kinds of Surveys
- 1.2 Scales:
 - 1.2.1 Simple
 - 1.2.2 Diagonal
 - 1.2.3 Vernier Scales.
- 1.3 Types of Surveys
 - 1.3.1 Chain Survey
 - 1.3.2 Compass Survey
 - 1.3.3 Plane Table Survey:
 - 1.3.4 Levelling
 - 1.3.5 Contouring
 - 1.3.6 Theodolite

2. SURVEY

- 2.1 Instruments used in Survey
- 2.2 Prismatic Compass, Dumpy Level, A Level, Theodolite, GPS Devices.
- 2.3 Rectangular and Oblique off Sets.
- 2.4 Frame Work of Triangles.
- 2.5 Tie and Check Lines
- 2.6 Field Book
- 2.7 Conventional Signs
- 2.8 Survey Plotting.

3. COMPASS SURVEY

- 3.1 Prismatic Compass
- 3.2 Parts and Uses
- 3.3 Forward Bearing

- 3.4 Backward Bearing
- 3.5 Reduced Bearings
- 3.6 Use of Prismatic Compass
- 3.7 Magnetic and True Meridian
- 3.8 Magnetic Needle
- 3.9 Local Attraction
- 3.10 Open and Close Traverse
- 3.11 Common Methods of Plotting
- 3.12 Closing Error and its Distribution

4. LEVELING:

- 4.1 Dumpy Level and Tilting Level.
- 4.2 Levelling Staff.
- 4.3 Temporary Adjustments.
- 4.4 Methods of Levelling
 - 4.4.1 Simple
 - 4.4.2 Compound
 - 4.4.3 Check
 - 4.4.4 Reciprocal
- 4.5 Level Book and Methods of Recording
- 4.6 Reduction of Level and Arithmetical Checks
- 4.7 Degree of Accuracy
- 4.8 Permanent adjustment of Dumpy Level
- 4.9 Levelling for Longitudinal and Cross Sections
- 4.10 Plotting
- 4.11 Use of Abney's Level
- 4.12 Tangent Clinometers
- 4.13 Spirit Level.
- 4.14 Bench Marks:
 - 4.14.1 G.T.S Bench Mark
 - 4.14.2 Permanent Bench Mark.
 - 4.14.3

5. DETERMINATION OF AREA BY DIFFERENT METHODS

- 5.1 Reduction and Enlargement of Maps

6. MAPS AND MAP READING:

- 6.1 Plotting
- 6.2 Colouring
- 6.3 Printing
- 6.4 Reducing
- 6.5 Copying
- 6.6 Enlarging of simple Maps by Various Methods (Squares And Proportional compass)
- 6.7 Calculation of Area From Maps by Different Methods:
 - 6.7.1 Plannimeter
 - 6.7.2 Graph Paper
- 6.8 Marking Dead Level and Graded Lines
- 6.9 Various Symbols of Maps & Map Reading

7. APPLICATION OF SURVEY TECHNIQUES IN FOREST DEMARCATION

- 7.1 Introduction to Land Revenue Record
- 7.2 Fard
- 7.3 Aks
- 7.4 Latha
- 7.5 MasaaviAimana,
- 7.6 Jamabandi,
- 7.7 KhasraGardawari,
- 7.8 Shajra,
- 7.9 TashreehBurgiat,
- 7.10 Misl e Haqeeqat,
- 7.11 WaajbulArz,
- 7.12 Mutation,
- 7.13 Final Report,
- 7.14 Difference Between Khalsa
- 7.15 Shamlat
- 7.16 Bandobasti Land
- 7.17 Re-Delineation of The Present Demarcation Lines and Detection of encroachments

FOREST SURVEY

(PRACTICALS)

1. **SURVEY**
 - 1.1 Compass Survey
 - 1.2 Chain Survey
2. **CHECKING OF FOREST BOUNDARY PILLARS**
3. **LAY OUT OF PLOTS OF GIVEN SIZE**
4. **PRACTICAL USE OF GPS**

6. FOREST ACCOUNTS AND PROCEDURE

1. **INTRODUCTION**
 - 1.1 Definition of Accounts
 - 1.2 Accounts & Transaction
 - 1.3 Definition of Accounting
 - 1.4 Branches of Accounting
 - 1.5 Benefits of Account
 - 1.6 Parties Interested in Accounting Information
 - 1.7 System of Accounting
2. **CASH ACCOUNT**
 - 2.1 Cash
 - 2.2 Revenue
 - 2.3 Expenditure
 - 2.4 Classification of Revenue
 - 2.5 Cash Advance
 - 2.6 Completion Monthly Account
 - 2.7 Earnest money Deposit
 - 2.8 Refunding of Earnest money Deposit
3. **MUSTER ROLLS & ITS PROCEDURE**
 - 3.1 Information of Muster Roll
 - 3.2 Preparation, Maintenance & Disbursement of Muster Roll

- 3.3 Measurement Books
- 3.4 Damage Report Register
- 3.5 Compensation case register
- 3.6 Prosecution case register
- 4. **ACQUAINTANCE ROLL & ITS PROCEDURE**
 - 4.1 Information of Muster Roll
 - 4.2 Preparation, Maintenance & Disbursement of Acquaintance Roll
- 5. **AUDIT**
 - 5.1 Auditor
 - 5.2 Element & objects of audits
 - 5.3 Fundamental Principles of Audit
 - 5.4 Kinds of Audit
 - 5.5 Government Audit
- 6. **TIMBER ACCOUNTS.**
 - 6.1 Timber Forms No.5 To 17
- 7. **INQUIRY PROCEDURE**
 - 7.1 Government Servants Efficiency and Discipline Rules 1973
 - 7.2 The Removal from Service (Special Powers) Sindh Ordinance 2000
- 8. **DUTIES AND POWERS OF VARIOUS FOREST EXECUTIVE OFFICERS**
 - 8.1 Chief Conservator of Forests
 - 8.2 Conservator of Forests
 - 8.3 Divisional Forest Officer
 - 8.4 Sub Divisional Forest Officer
 - 8.5 Range Forest Officer
 - 8.6 Forester/Block Officer
 - 8.7 Forest Guard
- 9. **Pay Rules and its Procedure**
- 10. **Leave Rules and its Procedure**
- 11. **TRAVELLING ALLOWANCE RULES**
- 12. **STORES:**
 - 12.1 Types,
 - 12.2 Purchase of Stock Rules

7. RANGE MANAGEMENT & SOIL CONSERVATION

1. RANGE MANAGEMENT

- 1.1 Definition
- 1.2 Importance of Rangelands and Range Management
- 1.3 Goals of Range Management

2. BASIC PRINCIPLES OF RANGE MANAGEMENT.

- 2.1 Correct King of Animal (Livestock)
- 2.2 Correct Number of Animals
- 2.3 Correct Season of Range use or Grazing
- 2.4 Proper (Uniform) Distribution of Livestock on range Areas
- 2.5 Range improvement of Practices

3. MANAGEMENT OF RANGELANDS AND GRAZING SYSTEMS.

- 3.1 Object of Grazing System
- 3.2 Characteristics of good grazing system
- 3.3 Effect of grazing on range area
- 3.4 Important grazing system in Pakistan

4. GRAZING PATTERNS & PRACTICES IN PAKISTAN

5. PROBLEMS AND CONSTRAINTS OF RANGE MANAGEMENT IN PAKISTAN

6. GOLDEN ROLES FOR (RANGE MANAGEMENT) GRAZING SYSTEM:

7. RANGE IMPROVEMENT

- 7.1 Range Improvement Practices

8. SHORT QUESTIONS

- 8.1 Animal Equivalent
- 8.2 Animal Unit
- 8.3 AUM
- 8.4 Carrying Capacity
- 8.5 Drip / Trickle Irrigation System
- 8.6 Ecosystem
- 8.7 Frequency of Use

- 8.8 Grazing System
- 8.9 Grazing Frequency
- 8.10 Grazing Intensity
- 8.11 Herding
- 8.12 Key Area
- 8.13 Key Species
- 8.14 Light Grazing
- 8.15 Range Land
- 8.16 Rang Management

9. DEFINITION AND SCOPE OF SOIL CONSERVATION

- 9.1 Importance of Study of Forest Soils in Relation to Tree Growth.

10. FORMATION OF SOIL:

- 10.1 Process of Weathering of Rocks and Formation of Soils,
- 10.2 Mode of Deposition of Disintegrated Materials.
- 10.3 Typical Soil Profile and its Zonation.

11. PHYSICAL PROPERTIES OF SOILS:

- 11.1 Soil Texture
- 11.2 Soil Structure
- 11.3 Pore Space
- 11.4 Soil Moisture
- 11.5 Role of Soil Moisture Retention and Soil Aeration in Tree Growth.
- 11.6 Soil, Plant And Water Relationship
- 11.7 Physical Characters of Soil
- 11.8 Site Selection for Nursery

12. SOIL TYPES AND CLASSIFICATION:

- 12.1 Distribution of Different Soil Types in Pakistan
- 12.2 Soil Salinity and Water-Logging.
- 12.3 Effects of Different Tree Species on Reclamation of Problematic Soils

13. MANGROVES ECOSYSTEM

- 13.1 Definition of Mangroves forest
- 13.2 Definition of Ecosystem & Explanation of Ecology of Mangroves Forest.
- 13.3 Methods of Propagation of Mangroves Forest

8. RECREATION, PARK MANAGEMENT & WILDLIFE

1. INTRODUCTION

- 1.1 Definition, Concept and importance
- 1.2 Need and Objectives
- 1.3 History of Recreational Use of Forests
 - 1.3.1 Forest Recreation World Wide
 - 1.3.2 Forest Recreation Nation Wide in Pakistan
- 1.4 The Need and importance of Recreation.
- 1.5 Role of Forests in Recreation

2. RECREATIONAL ASPECTS OF FORESTS

- 2.1 Place of Recreation in Forest Policies
- 2.2 Economic importance of Forest Recreation
- 2.3 Recreational Opportunities in our Forests
- 2.4 Recreation as Business/Enterprise
- 2.5 Impacts of Development of F. Recreation on Forest Resources
- 2.6 Concept Need and Obligations of Eco- Tourism

3. MANAGEMENT OF RECREATIONAL LAND

- 3.1 Objectives of Management
- 3.2 Planning
- 3.3 Administrative Organization
- 3.4 Personal Management
- 3.5 Financial Management
- 3.6 Controlling and Coordination
- 3.7 Budgeting
- 3.8 Awareness Raising
- 3.9 Eco-Tourism

4. IMPORTANT OUT DOOR RECREATIONAL SERVICES AND FACILITIES

- 4.1 Paths, Pony Tracks and Roads
- 4.2 Recreational and National Parks
- 4.3 Camping Areas
- 4.4 Picnic areas
- 4.5 Guides and Guards
- 4.6 Miscellaneous Structure(Sign Board,Hut,Motels)
- 4.7 Wash Rooms
- 4.8 Parking

5. IMPORTANT OUT DOOR RECREATIONAL OPPORTUNITIES AND ACTIVITIES

- 5.1 Hiking
- 5.2 Trekking
- 5.3 Water Sports
- 5.4 Winter Sport
- 5.5 Organized Tours
- 5.6 Hunting
- 5.7 Sight Seeing
- 5.8 Fishing

6. LANDSCAPING

- 6.1 Concept
- 6.2 Objective and importance of Landscaping
- 6.3 Important Consideration & Tips for Landscaping
- 6.4 Types of Landscaping
- 6.5 Principles of Landscaping
- 6.6 Landscaping Design
- 6.7 Landscaping Structure
- 6.8 Plants Used in Landscaping

7. WILDLIFE

- 1.1 Wildlife of Pakistan.
- 1.2 Economic importance of Wildlife.
- 1.3 Identification and Distribution of Wildlife in Pakistan.

8. WILDLIFE RESOURCES

- 2.1 Wildlife Resources
- 2.2 Importance of Wildlife
- 2.3 Wildlife in Pakistan
- 2.4 National Parks in Pakistan

9. ENVIRONMENTAL FORESTRY

1. INTRODUCTION TO ENVIRONMENTAL FORESTRY

- 1.1 Climatic and Edaphic Zones of Pakistan.
- 1.2 Ecosystem
- 1.3 Biosphere
- 1.4 Ecosystem, its Divisions and Importance
- 1.5 Structure and Functions of Ecosystem

2. POLLUTION

- 2.1 Types of Environmental Pollution
- 2.2 Causes of Environmental Pollution
- 2.3 Control on Environmental Pollution

3. THE ROLE OF FORESTS IN THE ENVIRONMENT.

4. BIODIVERSITY CONSERVATION:

- 4.1 Concept
- 4.2 Endangered Flora and Fauna
- 4.3 Reasons for Endangerment of Flora and Fauna
- 4.4 Rehabilitation of Endangered Species
- 4.5 Ex-Situ Conservation
- 4.6 In- Situ Conservation

5. ENVIRONMENT AND CLIMATE CHANGE:

- 5.1 Biodiversity, its types, importance, causes of loss of Biodiversity and Conservation of Biodiversity
- 5.2 Global Warming and its effects
- 5.3 Green House Effect
- 5.4 Climate Change and Desertification
- 5.5 Disaster Risk Reduction and Disaster Management,
- 5.6 Earthquakes

- 5.7 Torrential Floods and Mudslides
- 5.8 Forest Fires
- 5.9 Carbon Sequestration

6. PLANT SUCCESSION:

- 6.1 Introduction
- 6.2 Process of Succession

10. EXTENSION EDUCATION & AGROFORESTRY

1. EXTENSION EDUCATION

- 1.1 Definition of Education and Extension Education.
- 1.2 Different Forms of Education: Formal, Non-Formal and in-Formal.
- 1.3 The Scope and Concept of Extension Education.
- 1.4 Programmed Planning and Communication.
- 1.5 Learning and Laws of Learning.
- 1.6 Extension Supervision and its Basic Principles.
- 1.7 Extension Worker. Role of Extension Supervisors.
- 1.8 Extension Education Methods in Detail.
- 1.9 Role of Rural Schools in Forestry Extension.
- 1.10 Extension Publications
- 1.11 Extension Activities
 - 1.11.1 Walks
 - 1.11.2 Display of Banners And Streamers
 - 1.11.3 School Function
 - 1.11.4 Festivals and Exhibitions

2. SOCIAL FORESTRY:

- 2.1 Definition of Social Forestry
- 2.2 Motives and Constraints in Social Forestry Program
- 2.3 Nursery Raising
- 2.4 Road Side / Canal Side Plantations
- 2.5 Farm Forestry and Urban Forestry
- 2.6 Community Forestry
- 2.7 Joint Forest Management (JFM)
- 2.8 Art of Successful Social Forestry
- 2.9 Shelterbelts / Hurries Avenue Planting

3. SOCIAL ORGANIZATION:

- 3.1 Participatory Development (P.D.)
- 3.2 Principles of P.D.
- 3.3 Social Mobilization

- 3.4 Community Organization
- 3.5 Gender Sensitization
- 3.6 Participatory Forestry

4. AGROFORESTRY

- 4.1 Definition and Concept of Agro Forestry
- 4.2 Extension Forestry
- 4.3 Energy Forestry
- 4.4 Participatory Forestry etc.

5. HISTORICAL BACKGROUND OF AGRO FORESTRY.

- 5.1 Ecological, Socio-Economic and Institutional aspects of Agro Forestry,
- 5.2 Importance of Agro Forestry and Social Forestry in Pakistan

6. AGROFORESTRY SYSTEMS

- 6.1 Classification of Agro Forestry Systems
- 6.2 Functions of Trees Used in Combinations.
- 6.3 Definition of Silviculture Management

7. SOCIAL FORESTRY V/S TRADITIONAL FORESTRY

- 7.1 Social Forestry as a Tool For Local Community Development,
- 7.2 Productions and Management System of Social Forestry

11. FOREST MANAGEMENT

1. FOREST MANAGEMENT

- 1.1 Introduction and Scope of Forest Management.
- 1.2 Definition of Forest Management
- 1.3 Objectives of Forest Management
- 1.4 Principles of Forest Management
- 1.5 Scope of Forest Management

2. FOREST MANAGEMENT:

- 2.1 Historic Background of Forest Management,
- 2.2 Changing Management Approaches,
- 2.3 Production to Conservation Approach,
- 2.4 Solitary to JFM Approach (Shift From Policing To Participation)

3. GROWING STOCK:

- 3.1 Introduction
- 3.2 Factors Affecting the Growing Stock
- 3.3 Site and Site Quality
- 3.4 Significance of Site Quality
- 3.5 Identification of Site Quality
- 3.6 Volume Per Acre at Rotation Age
- 3.7 Ground Vegetation
- 3.8 Physiography and Soil
- 3.9 Height of Dominant and Co-Dominant Trees
- 3.10 Site Qualities Recognized in Pakistan
- 3.11 Species Composition
- 3.12 Stocking
- 3.13 Density,
- 3.14 Optimum Stocking Level
- 3.15 Marking Rules

4. FOREST RESOURCES AND FORESTRY ECONOMICS.

- 4.1 Regulation of Yield by Different Methods
- 4.2 Sustained Yield & The Normal Forest: Sustained Yield, The Normal Forest

5. ORGANIZATION OF FOREST:

- 5.1 Compartment and Sub-Compartment
 - 5.1.1 Compartment History File
- 5.2 Working Circle
- 5.3 Felling Series
- 5.4 Cutting Sections
- 5.5 Periodic Blocks.

6. PREPARATION OF WORKING PLAN AND SCHEMES

- 6.1 Importance and Application of Existing Plans.
- 6.2 Enumeration
- 6.3 Stock Mapping and Description of Compartment.
- 6.4 Methods of Study of Vegetation,
- 6.5 Survey of Vegetation, Sampling Etc.

7. TYPES OF FORESTS IN PAKISTAN

- 7.1 Littoral and Swamp Forests.
- 7.2 Tropical Dry deciduous Forests.
- 7.3 Tropical Thorn forests.

- 7.4 Sub-Tropical Broad-Leaved Evergreen forests.
- 7.5 Sub-Tropical Pine Forests.
- 7.6 Himalyan Moist temperate Forests.
- 7.7 Himalyan Dry temperate Forests.
- 7.8 Sub-Alpine Forests.
- 7.9 Alpine Scrub.

8. TYPES OF FOREST IN SINDH

- 8.1 Riverine Forests.
- 8.2 Irrigated Plantations (IPs)
- 8.3 Range Lands Plantations.
- 8.4 Mangroves Forests.

12. ISLAMIAT & PAK-STUDIES

1. Preliminary Education of Quran, Namaz and other important principles and aspects of Islam.
2. Geographical Study of Pakistan in general and of Sindh province in Particular (in reference of forest Areas)
3. Study of Forest Areas / Types / Zones of Pakistan and Special reference to forest areas in Sindh.

13. PHYSICAL TRAINING, SPORTS , DRILL & SWIMMING

14. 1ST AID AND HYGIENE.

1. Elementary instructions how to avoid common diseases and measures to be taken in case of attacks. Special lectures will be given for deeping proper sanitations.

15. EXAMINATION OF FOREST GUARDS COURSE.

1. Examination of game watchers will be written as well as practical.

There will be 1100 total marks distributed as under;

S. No	Name of subjects	Theory Marks	Practical Marks	Total
1	Forest Law	75	25	100
2	General Silviculture	75	25	100
3	Forest Botany	75	25	100
4	Forest Utilization	75	25	100
5	Forest Survey	50	50	100
6	Forest Accounts and Procedure	75	25	100
7	Rang Management & Soil Conservation	75	25	100
8	Recreation, Park Management & Wildlife	75	25	100
9	Environmental Forestry	75	25	100
10	Extension Education & Agroforestry	75	25	100
11	Forest Management	75	25	100
12	Islamiat & Pak-Studies	75	25	100
13	General marks by the principal	50		
	a. PT. drill and sports	25		100
	b. Attendance	10		
	c. Turnout and upkeep	15		
			Total Marks	1300

Certificates will be awarded on securing marks as under:

1. Honors _____ 75% in aggregate and 60% in each subject.
2. Higher _____ 40% in each aggregate and 25% in each subject.