SYLLABUS FOR SERICULTURE FIELD ASSISTANT

A (SERICULTURE BOTANY)

1. General idea of Botany and classification of plant kingdom
2. Distribution of sericultural important host plants in different states of India
3. Flowers and inflorescences of all silkworm food plants
4. Cell (description of a typical cell)
5. Pollination
6. Germination of seeds
7. Condition required for seed germination, dormancy of seeds
8. Use of hormones and types of hormone
9. Photosynthesis
10. Transpiration
11. Stomata of leaf
12. Macro and micro elements in soil for plant growth and symptoms in leaf when they are deficient
13. Study of Fungi, Bacteria and Virus
14. Effect of pruning, pollarding I Sericultural plants
15. Genetics, meaning of plant genetics
16. Chromosomes, Heterosis law

B (SERICULTURAL ZOOLOGY)

1. Meaning of Zoology, Role of Zoology in Sericulture industry
2. A brief idea of Entomology
3. Life history of Eri, Muga, Tassar and Mulberry Silkworm
4. Description of an animal cell, tissue structure
5. Cell Division-Mitosis, Meiosis, Chromosome, number of different silkworm species
6. Classification of Animal Kingdom
7. Systematic position of Eri, Muga, Tassar and Mulberry silkworm
8. Morphology of silkworm egg, larva, pupa and moth of Mulberry and Non-Mulberry silkworm species
9. Embryonic development of silkworm eggs
10. Differences between moth and butterfly, brief description of different silk producing insects of the world.
11. Anatomy of Silkworm species, Silk gland of Eri, Muga, Tassar and Mulberry silkworm, nervous system, mouth part, spinneret etc.
12. Cold storage/Incubation of silkworm eggs, pupae for hibernation and synchronization in Silk Industry
13. Metamorphosis, Ecdysis/Moult/Voltisism/Hibernation/Heterosis/Instars etc
14. Life history and Control measures (Aphids, bugs, Sucking insects, Apentales, Uzifly, Amphutukani muga, Ants, Lizard, Birds etc)
15. Wild Silkworms species of the world (Mulberry and Non-Mulberry)

16. Breeding and genesis of all silkworm species. Mendel's law of segregation, Hybrid vigour, inbreeding, out-crossing

C (HOST PLANT CULTIVATION/ AGRONOMY)

1. Introduction on host plants
2. Description of Mulberry host plants
3. Description of non-Mulberry host plants (Eri, Muga and Tassar silkworm food plants)
4. Distribution of host plants
5. Varieties of host plants
6. Soil, Climate and topography for growth of all the silkworm host plants
7. Soil texture and structure
8. Soil nutrients for plant growth
9. Soil types of Assam, N.E region and India for Sericulture plants (Mulberry, Castor, Kesseru, Ailanthus, Payam, SoaluMezankari etc
10. Nursery preparation, manuring and fertilization, irrigation, drainage, interculture practice for each type of host plant cultivation
11. Different methods of planting in farm, VGR, CMG and Grainage farm and village plantation
12. Terrace cultivation in hills
13. Sexual and asexual propagation of host plants
14. Types of hormones. Use of plant growth hormones in Sericultural plants
15. Use of leaf and its selection, plucking, harvesting, preservation, feeding for improved silkworm culture
16. Role of macro and micro elements in host plant growth and their effect on silkworm growth while deficient
17. Lay out of host plant cultivation and their use in field trials
18. Action calendar for host plant cultivation (pruning, pollarding, feeding)
19. Assessment of quality of 'Som' leaf by organoleptic taste (chewing taste) for Muga silkworm

D (SILKWORM REARING)

1. Meaning of rearing; indoor rearing and outdoor rearing. Mulberry and Eri silkworm rearing houses in village rearing, Govt. farms and Grainages in the state and in other countries
2. Model rearing houses in Assam, Karnataka, West Bengal, Jammu and Kashmir and Japan
3. Optimum requirement of temperature, humidity, air, light and darkness in Eri and Mulberry rearing house
4. Environmental temperature, humidity and rainfall in outdoor rearing of Muga and Tassar silkworm
5. Effect of temperature, humidity, day-length etc in different ages of leaf in different instars

6. System of indoor, outdoor and controlled rearing of Muga silkworm.
7. Rearing of wild silkworm
8. Chawki rearing of Eri, Muga and Mulberry silkworm. Importance of co-operative rearing societies
9. Function of different cold storage chambers and parts
10. Spinning of cocoon by different silkworms (Eri, Muga, Tassar and Mulberry)
11. Identification of mature worms, selection, mountage, spinning, spinning time, temperature, humidity
12. Types of cocoonage for each silkworm culture
13. Rearing cycle of the year for Eri, Muga, mulberry and Tassar
14. Life history of all the silkworm
15. Studies on differentmoults and instars of larvae
16. Identification, segregation of diseased and malformed worms from rearing batches
17. Effect of solar radiation and sunshine on Muga and Tassar rearing

E (SEED ORGANISATION AND GRAINAGE TECHNIQUE)

1. What is Grainage? Grainage for Eri, Muga, Mulberry silkworm. Grainage of hills and plains
2. Function of Grainage in different crops, seasons and climate
3. Area of Grainage and Grainage equipments
4. Functions of refrigerator, incubator- care and handling in grainage
5. Disinfection – disinfecting agents, acid treatment of eggs in Grainage
6. Temperature, humidity and light in Grainage houses
7. Handling of moth for pairing, synchronization, egg laying etc in grainage
8. Selection of life cocoon (pupae) for seed purpose. Handling, carrying/transporting of seed cocoon and eggs in all silkworm culture for Grainage and field rearing
9. Seed examination- (i) examination in larval, pupal abd cocoon stage (ii) examination in moth stages of all silkworms for seed purpose, methods of moth examination of Eri and Muga silkworm
10. Mulberry and Tassar Pasteur methods and SRS method (Muga) of seed examination (Pebrine, Flacharie, Grassarie, Muscardine diseases)
11. Pestle and morter. Types and use in seed examination
12. Microscope – (i) use (ii) parts (iii) function (iv) care and (v) handling of microscope in seed examination
13. Day – length, temperature and humidity in grainage house
14. Black boxing in silkworm hatching
15. Sex preparation in silkworm
16. Pests and predators of silkworm
17. Importance of seed organization, isolation of seed area, seed legislation in India
18. Maintenance of foreign seed station in Assam, hill amelioration of foreign seed station
19. P4, P3, P2, P1 station and their functions in seed organization.
20. Production of reproductive seeds in Govt. seed Grainage and Farms. Insdustrial seeds

F (PATHOLOGY AND ENTOMOLOGY)

1. Terms used in applied entomology and sericultural plant protection
2. Disinfecting agents (doses and methods of application) [Egg treatment in acids, alkalis, hot water and formalin- their doses and time
3. Diseases of mulberry plant and their management (casual organism, symptoms, peak season and management). Leaf spot, Powdery mildew, Rust, Rood-rot, Dwarf diseases, Mosaic diseases, Root-knot nematode and Mineral deficiency diseases
4. Disease of Som plant (casual organism, peak period, symptoms, management). Grey Blight, Leaf spot, Leaf rust, Leaf blight, Leaf curling, Wilt.
5. Diseases of castor plant (casual organism, peak period, symptoms, management). Seedling blight, Alternaria blight, Leaf spot, Powdery mildew, Wilt
6. Silkworm diseases and their management (casual organism, mode of infection, symptoms, peak period and management). Protozoan disease, Viral diseases, Fungal diseases, Bacterial diseases. Effect of pollution on Muga Silk industry.
7. Pests of Mulberry plant and their control measures
8. Pests of Muga food plant and their control measures
9. Pests of Castor plant and their control measures
10. Pests and Predators of Mulberry silkworm, Muga silkworm, Eri silkworm and Tassra silkworm and their control measures
11. Appliances used in birds scraping in sericulture

G (SILK REELING AND TESTING)

1. Introduction of reeling and raw silk of Muga, Mulberry and Tassar and its uses
2. Importance of reeling industry, brief account of Soualkuchi Reeling Industry
3. Cocoon quality (mulberry, Muga, Tassar)- (i) cocoon spinning (ii) optimum condition required for spinning cocoons (iii) importance of quality (iv) commercial and physical characteristics (v) defective cocoons
4. As raw materials (Mulberry, Muga and Tassar)- (i) Selection (ii) testing (iii) prese rvation of cocoon (iv) type of building equipment (v) problem and care in different seasons
5. Stifling and conditioning (Muga and Mulberry)- (i) Sun drying (ii) steam (iii) evaluation of hot air dryers (methods used in India and Japan (iv) storage (v) deflossing (vi) riddling
6. Boiling (muga and mulberry)- (i) Sunken system (ii) type of Floating system of boiling (iii) boiling in alkaline water, soaking system and other methods for Muga
7. Brushing (Muga and Mulberry)- (i) stick (ii) prong (iii) hand brush (iv) machine brush for Mulberry (v) brushing by hand for muga
8. Reeling operation- types of reeling machine for mulberry- (i) Country charkha (ii) cottage machine (iii) Domestic reeling machine (iv) Filature system of reeling (v) comparative study of these systems (vi) new technique in reeling

9. Reeling operation for Muga – types of operation for muga- (i) Hand Bhir (ii) Pedaling Bhir (iii) Trivedi Bhir (iv) Chowdury type (v) CMERS fabricated Muga reeling machine (vi) Bharali type (vii) Das type (viii) Ambar charkha for reeling (ix) CSTRI motorized Muga reeling machine
10. Re-reeling – (i) Silk examination (ii) Lacing (iii) Hank making (iv) Skeining (v) Book making (vi) Packing
11. By-product of reeling
12. Object of silk testing in sericulture
13. Raw silk testing and classification, objects, principles
14. Methods of sampling- visual and mechanical test of raw silk
15. Equipment used in silk testing (IST). Different methods of testing. Strength, tenacity, elongation and tensile strength
16. Advantage of silk testing, standard conditions, standard bale, standard atmosphere and specific gravity of silk

H (SPINNING)

1. Introduction to spinning, types of spinning
2. Raw materials for spinning (Eri, Muga, Mulberry, Tassar cut cocoons and silk waste)
3. Pre-spinning operation
4. Degumming of raw material for spinning
5. Process of spinning in Charkhas, precautions during spinning
6. Study of the contrivances or appliances of spinning, different spinning machines- N.R. Das type, Trivedi type, Nagakhelia, Singh-type, Thailand type spinning machine, Bharali type, composite reeling and spinning machine, Ambar Charkha, Takli, CSTRI motorized cum pedal spinning wheel and other contrivances available, their merits and demerits
7. System of measurements and units of thickness of the silk filament (Denier, Counts etc)
8. Spun silk industries of India, Spun silk mills, their utilizes and capacities, process of manufacture in spun silk mills, noil spinning, noil yarns etc
9. Importance of spun silk industries, importance in relation to reeling
10. Study on production percentage and waste percentage of materialsand degummed materials
11. Ghicha spinning, different types of spun yarns produced in the country
12. Introduction to twisting, kinds of twisting, twist per inch, importance of twisting etc.

I (SERUCULTURE CHEMISTRY)

1. General idea of chemistry elements, atoms, molecules, compound & mixture, radical symbols & formula with example. Physical change and chemical change. Simple chemical reaction.

2. Importance of Chemistry in Sericulture, Chemistry of Host plant leaf, Silk flora (Eri, Muga, Mulberry). Chemical components of silk constitution, physical and chemical properties of silk yarns.
3. Chemistry of soil texture & structure preference of soil in Sericulture importance, definition of pH, Acidity and alkalinity of soil, effect of N P K, systems of deficiency and measures of recovery.
4. Fertilizers – Definition, importance, classifications, organic & inorganic manures, FYM, compost manure, urea, sugar phosphate, murate of potash etc.
5. Chemical compounds used in Sericulture Industry, Formalin, HCL, NaOH etc. Descriptions of the preparations, chemical formula and usefulness in Sericulture.
6. Importance of chemical processes in Sericulture industry, Degumming, bleaching, dyeing silk with special reference to chemical reaction (if) Acid treatment in egg hatching, use of compounds in cold reeling process.
7. Carbohydrates and proteins with reference to host plant leaf and silk (Eri, Muga and Mulberry), methods of identification in brief.
8. Water- Hard & Soft water. Distilled water. Transformation of hard water to soft water (brief description of methods). Selection of water, alkali etc used in reeling of silk.
9. Balance- Mass and weight (Definition) classification, use of balance in sericulture industry.
10. Temperature & Humidity – Definition, description, effect of temperature and humidity in silkworm rearing, controlling methods etc.
11. Use of disinfection in Sericulture Industry, probable chemical reaction in germ killing.
12. Silk by – products (Eri, Muga and Mulberry).
13. Hormones – Constitution, descriptive of some important hormones in Sericulture Industry, its uses.

J (FARM MANAGEMENT AND STATISTICS)

PART - 1

1. What is farm, soil and topography of a Sericultural Farm (Eri, Muga, Mulberry & Tassar farm separately.
2. Conditions to be studied for establishment of Eri farm, Muga farm and Mulberry farm under Assam and N.E. region condition.
3. Farms of other silk producing countries.
4. Staffing pattern of a state farm and a Grainage, their distribution of duties.
5. Target and achievement of farm and Grainages.
6. Lay out of a seed and a commercial Sericulture Farm.
7. Procurement of seed cocoon, preparing d.f. layings, maintenance and distribution to commercial rearers.
8. Irrigation system of a Sericulture Farm/Grainage.
9. Farm management in different seasons of the year (spring, pre-monsoon, summer and autumn) for Mulberry culture.
10. Underground cold storage, above ground cold storage and their use in Sericulture.

PART – 2

1. Importance of statistics in sericulture, methods of collection of statistical data and their statistical compilation and analysis.
2. Mean, median, mode, graphs, histogram in statistics.
3. Standard error and critical differences.
4. A brief account of electronic calculators.
5. Export and import structure of raw silk in Assam, N.E. Region, India and the world.
6. Marketing of muga seed cocoon and raw silk in Assam.
7. Lay out plan of statistical design for field experiments and data processing, its use in Sericulture.
8. Randomized Block Design, Latin Square Design and Split Plot Design, their utility in different plant and rearing experiments in sericulture.