



Government of Jammu and Kashmir,  
Services Selection Board,  
Zum Zum Building Rambagh, Srinagar.

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**Marks:-150**

**Time:-2:30 Hours**

**Syllabus for Written test (Objective Type) for the post of Sericulture  
Assistants/ Field Assistants/ Seed Examiners**

**History and Development of Silk Industry**

**07 Marks**

Origin and history of sericulture in the world, India and J&K, importance of sericulture in the world, National and international silk organizations, organizational set up in different countries including India. Development of sericulture through plans; World; Bank projects, CSB and its institutions. Sericulture organization State level with reference to the planning and quality control, marketing, .silk .exchange, export-import policy, internal consumption, Export: import laws relating to. the production of seed, cocoon, raw silk and transport, price stabilization. Organisation of Sericulture teaching, research, CSR&TI, Universities and extension. Voluntary organizations in sericulture. Role of SKUAST in the development of sericulture in J&K.

**Cultivation of Host Plants of Silkworm**

**11 Marks**

Origin and distribution of host plants of different silkworms, climatic requirements, different types of soils, physical and chemical properties, soil profile, importance of texture and structure in relation to growth of mulberry and other host plants, - physical properties with. reference to aeration, moisture and temperature, propagation techniques, planting "systems", cultural operations and weed management,' pruning, fertilization, role of plant nutrients, sources and composition physical properties of different manures and fertilizers. Irrigation practices. Harvesting practices, Harvesting and preservation of leaves Non-cash inputs.

**Pests of Silkworms**

**11Marks**

Tachnid fly, (*Exorista* spp). of silkworm: classification, distribution, occurrence, nature of damage and alternate hosts,: behaviour in relation to emergence, matting, oviposition and flight,: preventive measures-chemical control, chemosterilization, biological control, genetic control and use of biopesticides and integrated management. Importance of cocoon pests in grainages. Biology, nature of damage and other hosts of *Dermistes* spp.: its preventions through physical, mechanical and chemical means, integrated management of the pest. Occurrence, nature of damage, prevention and control of other pests of silkworm like Pantatomid bug (*Canthecona* sp.) praying mantid (*Hierodula* sp). Red ant (*Oecophylla* sp.) Braconid fly (Apantdes sp.) ants, rodents and lizards.

**Morphology and Systematics of Silkworm**

**07 Marks**

VGeneral insect morphology, external morphology of different stages of mulberry, tasar, muga and eri silkworms. Changes during moulting and changes in pupal morphology with age. Study of insect orders with special references to sericigenous insects.

### **Diseases of Host Plants of Silkworms**

**07 Marks**

Classification of mulberry diseases. Symptoms, etiology, disease cycle and management of diseases of mulberry. Principles of plant disease management, avoidance, exclusion, cultural and biological methods, classification and mode of action: host resistance; effect of plant protection chemicals on the health of silkworms and silk yields and approaches in minimizing their residual toxicity,

### **Mulberry Production and Management**

**07 Marks**

Factors affecting cultivation-soil elevation, temperature, humidity, water requirement, photoperiod etc. Land preparation for mulberry cultivation, planting methods, irrigation, application of manures and fertilizers. Mulberry propagation techniques-propagation through seeds, cuttings, grafting, layering and tissue culture. Pruning and training, intercultivation, interculture, mulching Harvesting. and preservation of mulberry leaves.

### **Silkworm Anatomy and Physiology**

**10 Marks**

Anatomy of digestive, circulatory, respiratory, excretory, nervous, reproductive and muscular systems of mulberry and non-mulberry silkworms. Anatomy of silk glands. Physiology of respiration, circulation, excretion and reproduction, physiology of silk secretion. Hormonal mechanism of moulting, physiology of diapause, sensory physiology, olfactory and gustatory stimuli of feeding. Sex attractants, nutrition and host preference. Artificial diets. Effect of juvenile hormone analogues on moulting, silk secretion and oviposition. Embryonic development with special reference to hibernation, Embryonic development in non-mulberry silkworm species.

### **Mulberry Silkworm Rearing**

**12 Marks**

Biology of mulberry silkworm. Rearing houses and appliances. Disinfection, care in handling and incubation of eggs; dark treatment, brushing; leaf selection for different instars, frequency and quantum of feeding. Environmental conditions for rearing of young and late age silkworms. Importance and maintenance of temperature and humidity. Care at moulting; spacing of worms, bed cleaning, young and late age rearing; importance of hygiene in silkworm rearing; mounting of worms; effective rate of rearing, cocoon harvesting and sorting, transportation and marketing of cocoons, yield of cocoon crop; and quality of cocoons, leaf cocoon ratio and conversion efficiency.

### **Silkworm Seed Technology**

**12 Marks**

Importance of, seed production in sericulture. Seed organization in India and abroad, seed areas, special features of seed areas and seed transaction. Seed grainage, grainage equipments and seed production; cost structure of a model grainage, management of industrial grainages, Maintenance of seed records in grainages. Different models for commercial seed production and seed preparation under each model; Reproductive and industrial seeds. Importance of seed cocoons; nucleus seed-production and their preservation. Pebrine disease management. Seed hibernation, hibernation schedules, preservation and handling of silkworm 'eggs. Embryonic development. Artificial and natural hatching- different methods of artificial hatching. Schedule of chilling and acid treatment. Preparation of loose eggs and egg layings. Standards of quality egg production and seed transportation. National silkworm seed project. Seed legislation Act.

### **Pests of Host Plants of Silkworms**

**11 Marks**

Insect and non-insect pests of host plants of mulberry and non-mulberry silkworms; seasonal occurrence, duration, intensity, nature and extent of damage, symptoms of attack of *Glyphodes pyloalis*, *Spilosoma oblique*, *Agrotis ipsilon*, *Pseudoulcopsis pentagona*, *Apriona japonica*, *Holotricha consanguinea* and *Maconellicoccus hirsutus* and other minor pests viz., thrips, jassids, mites and nematode pests. Bioecology of pests. Status of pests, biotic potential, general equilibrium, economic thresh hold level and economic injury level. Concept and principles of mulberry pest management- cultural, chemical and biological. Insecticides, their formulation and application. Pesticide residue, safety period and LD<sub>50</sub>.

### **Silkworm Breeding & Genetics**

**12 Marks**

Origin and evolution of silkworms; gemetogenesis and crossing over in mulberry silkworms; fertilization, differentiation of silkworm races, characters of importance in silkworm breeding, translocation in silkworms, autosexing, breeding for autosexing races, preliminary quantitative genetic analysis of different quantitative traits. chromosome structure and number, chromosomal aberrations in silkworms, heritable and non-heritable traits, inheritance of qualitative and quantitative traits, sex linked inheritance, peleiotropism, sex determination; genetics of larval marking, larval and cocoon colour; maternal inheritance, mosaicism, parthenogenesis and polyploidy; genetics of moultnism and voltinism. Principles and methods of silkworm breeding, inbreeding, out breeding and heterosis breeding. Polyhybrids- their merits and demerits. Breeding for disease resistance and high temperature tolerant races. Backcross breeding and mutation breeding. Norms of silkworm race authorization and Silkworm Race Authorization Body.

### **Diseases of Silkworm**

**11 Marks**

Introduction to silkworm diseases, infectious and non-infectious diseases of silkworms, nature and extent of damage, biotic and abiotic factors. Physical and chemical injuries. Important diseases of silkworm- pebrine, muscardine, flacherie and grasserie; their causal agents, life cycles, symptoms, diagnosis; seasonal factors and epizootiology. Isolation, purification and identification of silkworm pathogens. Alternate hosts of silkworm pathogens. Serological techniques in detection of silkworm diseases. LC<sub>50</sub> and LD<sub>50</sub> - concept. Histopathology and pathophysiology of various diseases Importance of bed disinfectants, disease prevention and control measures.

### **Silk Technology**

**12 Marks**

Physical and commercial characteristics of cocoons. Cocoon testing, grading, transportation, different methods of stifling, drying, storage and marketing of cocoons, effect of storage on reeling cocoons, principles of reeling, reeling of cocoons by cottage basin and charkha machines, economics of country charkha and cottage basins. Cocoon cooking by different methods; brushing for sunken and top reeling systems, computerized cooking and brushing machines, reeling of cocoons, formation of reeling end, automatic reeling machines, re-reeling; lacing, silk examination- silk testing and grading, skeining, booking, bale making, storage and selling of raw silk. Classification of waters, water testing kits, standard water, ·problematic waters - reclamation of water - comparative efficacy of improved reeling machine. Economics of reeling, productivity estimation. Characteristics

of bivoltine and multivoltine silks. Various uses of silk. Silk exchange and international standards of silk. Improved spinning technology for Eri silk. Cocoon marketing in J&K and price fixation of cocoons.

### **Seri-Business Management**

**10 Marks**

Nature and scope of seri-business management. Difference between farm and non-farm business management. Relationship among business firms- horizontal/vertical integration and co-ordination. Sericultural based industries like carpet, textile, spun silk, handloom silk and matka silk industry- meaning and classification. Analysis of market opportunity. Capital management in trade and sericulture based industries. Meaning of business finance, capital needs, estimation of capital requirements and sources. Profit theories normal profit and economic profit. Investment evaluation of sericulture based industries in terms of pay back period. Analysis of business performance - solvency ratios, liquidity ratios, efficiency ratios and profitability ratios. Importance of sericulture in rural, national and world economics. Methodology for estimating cost of production of sericultural products. Role of price in economic development. Economics of mulberry leaf production, cocoon production and silkworm seed production. Economics of chawki and late age rearings. Economics of silk reeling and weaving- charka, cottage and filature. Employment generation under different activities of sericulture. Risk and uncertainty in sericulture.

### **Silk weaving, Dyeing and Printing Technology**

**10 Marks**

Introduction to silk weaving, process for weaving- winding, doubling, twisting, rewinding, warping, beaming, drawing, denting, weft preparation. Different pim winding methods. Handloom and powerloom weaving, shuttleless powerlooms. Quality criteria in silk weaving. Weaving defects. Different processes of silk yarn and fabric. Objectives of degumming, bleaching and dyeing. Introduction to different classes of dyes and chemicals used for silk dyeing. Printing of silk- hand block, screen printing. Finishing of raw silk.

**(S. A. Raina) KAS**  
Secretary  
Services Selection Board  
Srinagar.