

**UNIVERSITY OF MYSORE****Yuvaraja's College (Autonomous), Mysuru – 570 005****PROFORMA OF INSTRUCTIONS AND EXAMINATION IN SERICULTURE AS AN
OPTIONAL UNDER CHOICE BASED CREDIT SYSTEM (CBCS) AND CONTINUOUS
ASSESSMENT GRADING PATTERN (CAGP) IN B.Sc. COURSE****(Duration of the Course: 3 Years/6 Semesters)**

Semester	Course	Title of the Paper	Instruction Hrs (L:T:P) /Week	Credit	Duration of Exam (Hrs.)	Marks		Total Marks
						I A (C1 + C2)	Final Exam (C3)	
Discipline Specific Core (DSC) Course								
I	DSC-(SER)A Theory	Biology of mulberry and silkworm	4:0:0	4	3	10+10	80	100
	DSC-(SER)A Practical	Biology of mulberry and silkworm	0:0:4	2	3	10+10	80	100
II	DSC-(SER)B Theory	Mulberry Cultivation and Silkworm Rearing	4:0:0	4	3	10+10	80	100
	DSC-(SER)B Practical	Mulberry Cultivation and Silkworm Rearing	0:0:4	2	3	10+10	80	100
III	DSC-(SER)C Theory	Mulberry and Silkworm Crop Protection	4:0:0	4	3	10+10	80	100
	DSC-(SER)C Practical	Mulberry and Silkworm Crop Protection	0:0:4	2	3	10+10	80	100
IV	DSC-(SER)D Theory	Physiology of Mulberry and Silkworm	4:0:0	4	3	10+10	80	100
	DSC-(SER)D Practical	Physiology of Mulberry and Silkworm	0:0:4	2	3	10+10	80	100
Discipline Specific Elective (DSE) Course : Any One								
V	DSE-(SER)A Theory	Mulberry & Silkworm breeding and Silkworm Seed Technology	4:0:0	4	3	10+10	80	100
	DSE-(SER)A Practical	Mulberry & Silkworm breeding and Silkworm Seed Technology	0:0:4	2	3	10+10	80	100
	DSE-(SER)A Theory	Agronomy and Entomology	4:0:0	4	3	10+10	80	100
	DSE-(SER)A Practical	Agronomy and Entomology	0:0:4	2	3	10+10	80	100
SKILL ENHANCEMENT COURSE (SEC)								
	SEC-(SER) PAPER-1	Sericulture Technology	2:0:0	2	3	10+10	80	100
Discipline Specific Elective (DSE) : Any One								
VI	DSE-(SER)B Theory	Silk Technology, Vanya Sericulture and Extension	4:0:0	4	3	10+10	80	100
	DSE-(SER)B Practical	Silk Technology, Vanya Sericulture and Extension	0:0:4	2	3	10+10	80	100
	DSE-(SER)B Theory	Entrepreneurship development in sericulture	4:0:0	4	3	10+10	80	100
	DSE-(SER)B Practical	Entrepreneurship development in sericulture	0:0:4	2	3	10+10	80	100
SKILL ENHANCEMENT COURSE (SEC)								
	SEC-(SER) PAPER-2	Silk Technology	2:0:0	2	3	10+10	80	100

Sd/-
(Dr. H. B. MAHESHA)
Chairman - BOS in Sericulture (UG)



UNIVERSITY OF MYSORE
Yuvaraja's College (Autonomous)
SERICULTURE SYLLABUS AS AN OPTIONAL
IN B.Sc. COURSE



I SEMESTER		
DSC – (SER) A: BIOLOGY OF MULBERRY AND SILKWORM		
Theory		4 hrs/week x 16 weeks = 64 hrs.
Unit -1		
1	Introduction to Sericulture-Origin and history of Sericulture- Silk road, spread of Sericulture to Europe, South Korea, Japan, India and other countries.	4 hrs.
2	Sericulture map of India and World. Components of Sericulture.	2 hrs.
3	Sericulture organization in India and Karnataka; role of state departments of Sericulture, CSB, Universities and NGOs in Sericulture development.	4 hrs.
4	Sericultural practices in tropical and temperate climate.	2 hrs.
5	Employment generation in sericulture-Role of women in sericulture.	2 hrs.
6	Textile fibres: Types- natural and synthetic fibres- types of silk produced in India and their importance.	2 hrs.
Unit -2		
7	Sericultural practices in rain-fed and irrigated conditions; traditional and non-traditional areas.	2 hrs.
8	Salient features, economic importance of the family Moraceae. Phytogeography and systematics of the genus <i>Morus</i> L. and its species. Botanical description of mulberry.	4 hrs.
9	Morphology of mulberry and medicinal properties. Floral biology of mulberry: Structure of male and female flowers, Catkins.	4 hrs.
10	Anther and ovule in mulberry; micro- and megasporogenesis; development of male and female gametophytes; pollination, fertilization; development of endosperm, embryo and seed; polyembryony and parthenocarpy in mulberry.	6 hrs.
Unit -3		
11	Anatomy of mulberry internal structure of stem, root, petiole and leaf lamina; secondary growth in root and stem. Structure and organization of shoot and root meristems.	6hrs.
12	Popular mulberry varieties of India with special reference to Karnataka.	2 hrs.
13	General characteristic features of insects; classification of sericigenous insects; Characteristic features of the order Lepidoptera; detailed study of the families-Saturnidae and Bombycidae.	2 hrs.
14	Classification of silkworms based on moultnism, voltinism and geographical distribution; popular silkworm breeds and hybrids of Karnataka; their economic traits.	2 hrs.
15	Insect egg: Morphology and structure; polyembryony, parthenogenesis. Gametogenesis - Oogenesis and Spermatogenesis.	4 hrs.
Unit -4		
16	Fertilization and Embryonic development in silkworm <i>Bombyx mori</i> .	4 hrs.
17	Life cycle of <i>Bombyx mori</i> ; morphology of egg, larva, pupa and adult.	4 hrs.
18	Morphology and anatomy of digestive, circulatory, excretory, respiratory, nervous system of silkworm larva.	4 hrs.
19	Morphology and anatomy of reproductive systems of silk moth.	2 hrs.
20	Morphology and anatomical structure of Silk gland.	2 hrs.

DSC – (SER) A: BIOLOGY OF MULBERRY AND SILKWORM		
Practical	16 Practicals of 4 hrs. each	
1	Sericulture maps: (a) World maps and Silk Road. (b) Sericulture map of India and Karnataka.	2 Prac.
2	Taxonomic description of mulberry.	2 Prac.
3	Study of five popular mulberry cultivars of Karnataka (Mysore local, K ₂ , S ₃₆ , S ₁₃ and V ₁)	1 Prac.
4	Mounting of Pollen grains, Ovule and Embryo.	1 Prac.
5	Anatomy of petiole, leaf lamina, stem and root.	2 Prac.
6	Life cycle of <i>Bombyx mori</i> - Morphology of egg, larva, pupa and adult of <i>Bombyx mori</i> .	1 Prac.
7	Embryo mounting: 7 th , 8 th and 9 th day	1 Prac.
8	Sex separation in larva, pupa and adult of the silkworm <i>Bombyx mori</i> .	1 Prac.
9	Dissection and display of: (a) Digestive system of larva. (b) Silk glands. (c) Reproductive system of male and female moths. (d) Mounting of larval mouth parts and spiracle. (e) Nervous system of silkworm larva.	5 Prac.
SCHEME OF PRACTICAL EXAMINATION		
Duration-3 hrs.	Max. Marks-80	
Q1	Taxonomic description of any one of the popular mulberry varieties. (Mysore local/K ₂ /S ₃₆ / S ₁₃ /V ₁) Note: Distribution of marks. a) Identification of the variety - 5 b) Diagnostic features - 15 c) Sericultural importance - 5	20 marks
Q2	Sectioning and Mounting of Petiole/Leaf Lamina/Stem/Root/ Pollen grains/ Ovule/ Embryo. (OR) Mounting of 7 th /8 th /9 th day embryo/larval skin/spiracle/body scales of silk moth. Note: Distribution of marks a) Staining procedure -3 b) Preparation and display -4 c) labeled diagram and Identification -3	10 marks
Q3	Any one of the following: Dissect and Display. Male/ Female reproductive system/Silk glands/Digestive system/Nervous system/Mouth parts. Note: Distribution of marks a) Dissection and display - 10 b) Labeled diagram with description - 10	20 marks
Q4	Identify and comment on the spots A, B, C and D. (any four from the practical syllabus/5 marks for each)	20 marks
Q5	Viva-voce: (any five questions from the practical syllabus)	10 marks

II SEMESTER		
DSC – (SER) B: MULBERRY CULTIVATION AND SILKWORM REARING		
Theory		4 hrs/week x 16 weeks = 64 hrs.
Unit- 1		
1	Definition of soil, soil structures, soil textures and soil profile.	3 hrs.
2	Types of soils in India, soil conservation methods.	3 hrs.
3	Importance of soils fertility with reference to mulberry cultivation; soil analysis- soil sampling, soil pH, organic carbon and NPK level.	3 hrs.
4	Propagation of mulberry- seedling, sapling, grafting and layering.	3 hrs.
5	Establishment of mulberry garden: Areas under mulberry cultivation in India, Species and Varieties under cultivation in India, General Descriptions, Climatic requirements, Soil conditions, mulberry cultivation under rain-fed and irrigated conditions, mulberry cultivation in hilly areas, mixed forming. Special references to tree plantations.	4 hrs.
Unit- 2		
6	Raising of commercial nursery; Application of root inducing hormones	2 hrs.
7	Introduction to different types of Manures and fertilizers: Biofertilizers, Foliar nutrition, Plant nutrients (macro and micro nutrients), composting, vermicomposting and Plant Hormones.	5 hrs.
8	Intercultivation and Mulching practices: Purpose, methods, time and frequency.	2 hrs.
9	Irrigation: Importance, Source, methods, periodicity and quantity of irrigation, over-irrigation and its effects.	2 hrs.
10	Leaf harvesting: harvesting methods (leaf and shoot harvests); transportation and preservation of harvested leaf and shoots. Pruning- Objectives, Importance and methods.	2 hrs.
11	Estimation of leaf yield: Importance of leaf quality.	1 hrs.
12	Mechanization in mulberry cultivation.	2 hrs.
Unit- 3		
13	Rearing house: Location, orientation, plan and utilities; model rearing house; low-cost rearing house.	3 hrs.
14	Rearing appliances-shelf and shoot rearing; requirements of rearing appliances (per unit rearing of 100 dfls).	3 hrs.
15	Disinfection of rearing house and rearing appliances; disinfectants (formalin, bleaching powder, chlorine dioxide, slaked lime and iodine compounds); rearing and personal hygiene.	3 hrs.
16	Selection of silkworm races/breeds for rearing- advantages and disadvantages of bivoltine and multivoltine pure races/ breeds and hybrids.	3 hrs.
17	Incubation- definition, requirement of environmental conditions, incubation devices; identification of different stages of development; black boxing and its importance.	4 hrs.
Unit- 4		
18	Chawki rearing: Preparation; brushing and its methods; types of chawki rearing – traditional and improved method; optimum environmental conditions; methods and frequency of feeding; methods of bed cleaning; spacing; moulting and care during moult.	4 hrs.
19	Late age silkworm rearing: Methods; optimum environmental conditions; feeding quantity and frequency; methods of bed cleaning; spacing; moulting and care during moult.	4 hrs.
20	Identification of spinning larva; spinning; mounting and mounting density; types of mountages, their advantages and disadvantages; environmental requirements during spinning.	3 hrs.

21	Harvesting: Time of harvesting; sorting, storage/ preservation, packaging and transport of cocoons; leaf-cocoon ratio; maintenance of rearing records.	3 hrs.
22	Mechanization in silkworm rearing	2 hrs.

DSC – (SER) B: MULBERRY CULTIVATION AND SILKWORM REARING		
Practical	16 Practicals of 4 hrs. each	
1	Determination of soil pH and water holding capacity in different soil samples.	1 Prac.
2	Mulberry Farm implements.	1 Prac.
3	Preparation of land, pits and rows; preparation of rooting media (fieldwork).	1 Prac.
4	Raising of sapling and seedling (field work).	2Prac.
5	Intercultivation, mulching, irrigation, pruning and estimation of leaf yield. (Demonstration and exercise).	2Prac.
6	Grafting and Layering in mulberry.	2Prac.
7	Harvesting and preservation techniques; leaf selection for different instars.	1 Prac.
	Silkworm Rearing Experiment should be conducted and Rearing Report should be submitted during examination.	
8	Rearing houses- model rearing house and low-cost rearing house.	1 Prac.
9	Rearing appliances.	1 Prac.
10	Disinfection- Types of disinfectants- concentration and dosage requirement; preparation of spray formulation of disinfectants.	1 Prac.
11	Incubation of silkworm eggs- Methods; black boxing.	1 Prac.
12	Brushing: Methods; Calculation of Hatching percentage. Chawki Rearing; use of paraffin paper and blue polythene sheet. Bed cleaning: use of bed cleaning net.	1 Prac.
13	Moulting: Identification of moulting larva, care during moulting. Late Age Silkworm Rearing: Methods. Mounting and mounting density; harvesting of cocoons; assessment of cocoons; types of mountages; Maintenance of records for silkworm rearing.	1 Prac.
SCHEME OF PRACTICAL EXAMINATION		
Duration-3 hrs.		Max. Marks-80
Q1	Determination of soil pH/ water holding capacity/ grafting/ layering	20 marks
	Note: Distribution of marks	
	a) Procedure - 6 b) Labeled Diagram - 4 c) To conduct Experiment - 10	
Q2	Calculations and procedure about disinfection/ brushing/ bed cleaning/ hatching percentage.	20 marks
	Note: Distribution of marks	
	a) Procedure/Description -10 b) To conduct Experiment/calculation -10	
Q3	Submission of fieldwork/field visit/rearing report.	10 marks
Q4	Identify and comment on the spots A, B, C and D. (any four from the practical syllabus/ 5 marks for each)	20 marks
Q5	Viva-voce: (any five questions from the practical syllabus)	10 marks

III SEMESTER		
DSC – (SER) C: MULBERRY AND SILKWORM CROP PROTECTION		
Theory	4 hrs/week x 16 weeks = 64 hrs.	
Unit-1		
1	Introduction to plant diseases and importance of plant protection.	1 hr.
2	Classification of mulberry diseases.	1 hr.
3	Influence of biotic and abiotic factors on the incidence of plant diseases	1 hr.
4	Mineral deficiency symptoms in mulberry	3 hrs.
5	Fungal diseases of mulberry: Occurrence, symptoms, etiology and preventive and control measures of the following diseases : (a) Powdery mildew. (b) Leaf spot. (c) Leaf rust. (d) Leaf blight. (e) Root rot.	5 hrs.
6	Root-knot disease of mulberry- occurrence, life cycle, symptoms, preventive and control measures.	1 hr.
7	Viral, bacterial and dwarf diseases of mulberry- their occurrence- symptoms and preventive and control measures.	4 hr.
Unit-2		
8	Weeds of Mulberry garden, classification, characteristics and effect on crop plants. Integrated weed management. Weeding methods.	2 hrs.
9	Pest: Definition; pest outbreak; pest forecasting.	4 hrs.
10	Major pests: leaf roller, Bihar hairy caterpillar, mealy bug and thrips – life cycle, nature of damage and their preventive and control measures.	4 hrs.
11	Minor pests: girdlers, termites and mites- life cycle, nature of damage and their preventive and control measures.	2 hrs.
12	Pesticides: Forms, formulations, calculation and application.	4 hrs.
Unit-3		
13	Introduction; classification of silkworm diseases.	1 hr.
14	Protozoan disease – symptomatology, structure of pebrine spore, life cycle of <i>Nosema bombycis</i> , source, mode of infection and transmission, cross infectivity, prevention and control.	3 hrs.
15	Bacterial diseases – types, causative agents, symptoms, factors influencing flacherie, source, mode of infection and transmission, prevention and control.	6 hrs.
16	Viral diseases (grasserie, infectious flacherie, cytoplasmic polyhedrosis, denonucleosis and gattine)-causative agents- symptoms – sources, mode of infection and transmission-prevention and control.	6 hrs.
Unit-4		
17	Fungal diseases: white and green muscardine and aspergillosis- causative agents- symptoms - structure and life cycle of fungal pathogen- mode of infection and transmission- prevention and control.	4 hrs.
18	Integrated management of silkworm diseases.	2 hrs.
19	Life cycle of Indian uzifly; seasonal occurrence; oviposition and host-age preference; nature and extent of damage; prevention and control; integrated management of Indian uzifly.	3 hrs.
20	Cocoon pests of silkworm: Dermestid beetle- life cycle; nature and extent of damage; Prevention and control measures.	2 hrs.
21	Predators of silkworm: Cockroaches, ants, lizards and rodents; prevention and control measures.	2 hrs.
22	Brief account of methods of pest control: Cultural, mechanical, physical, legislative (Quarantine), chemical, genetical / autocidal, biological and IPM.	3 hrs.

DSC – (SER) C: MULBERRY AND SILKWORM CROP PROTECTION		
Practical	16 Practicals of 4 hrs. each	
1	Study of powdery mildew, leaf spot and leaf rust through sectioning, staining and temporary mounting.	3Prac.
2	Study of root-knot nematode in mulberry.	1 Prac.
3	Weeds of Mulberry garden, classification, weeding methods.	1 Prac.
4	Collection, mounting / preservation of insect pests of mulberry (field work).	1 Prac.
5	Identification of mulberry pests. Study of nature of damage of the following pests: Leaf roller, Bihar hairy caterpillar, scale insect, mealy bug, thrips, beetles, jassids and grasshoppers.	1 Prac.
6	Study of pesticides, their formulation, applicators (sprayers and dusters)	1 Prac.
7	Identification of different diseased silkworms based on external symptom (grasserie, flacherie, muscardine and pebrine). Identification of pathogens associated with silkworm diseases: Staining and preparation of temporary slides of bacteria, spores of pebrine, polyhedra of nuclear polyhedrosis virus and mycelial mat/spores of muscardine.	4 Prac.
8	Methods of application of silkworm bed disinfectants for management of silkworm diseases.	1 Prac.
9	Life cycle of Uzi fly; Identification of uzi-infested silkworms and cocoons.	1 Prac.
10	Life cycle of Dermestid beetles: Dermestid beetle infested silkworm cocoons and estimation of incidence.	1 Prac.
11	Predators of silkworm.	1 Prac.
SCHEME OF PRACTICAL EXAMINATION		
Duration-3 hrs.	Max. Marks-80	
Q1	Temporary mounting of any one of the following; Leaf spot/ leaf rust/ powdery mildew/ root knot nematode of mulberry. Note: Distribution of marks a) Identification with binomial nomenclature - 3 b) Sectioning, staining and mounting - 10 c) Labelled diagram with description - 7	20 marks
Q2	Temporary mounting of any one of the following. Pebrine spore/ nuclear polyhedral bodies/ mycelia and conidial spores. Note: Distribution of marks a) Identification and binomial nomenclature - 3 b) Staining and mounting -10 c) Procedure and diagram - 7	20 marks
Q3	Submission of fieldwork/field visit/rearing report.	10 marks
Q4	Identify and comment on the spots A, B, C and D. (any four from the practical syllabus/ 5 marks for each)	20 marks
Q5	Viva-voce: (any five questions from the practical syllabus)	10 marks

IV SEMESTER		
DSC – (SER) D: PHYSIOLOGY OF MULBERRY AND SILKWORM		
Theory	4 hrs/week x 16 weeks = 64 hrs.	
Unit –1		
1	Absorption of water and solutes by roots; effect of external conditions; root pressure; ion exchange and active absorption.	3 hrs.
2	Mineral nutrition- macro and micro nutrients; their physiological role.	2 hrs.
3	Transpiration: Significance; stomata- mechanism of opening and closing; regulation of water loss by stomata; factors influencing the rate of transpiration.	4 hrs.
4	Biological nitrogen fixation; types, mechanism of nitrogen fixation.	3 hrs.
5	Biofertilizers: types, mass production, application methods and importance on mulberry growth.	4 hrs.
Unit-2		
6	Biochemical composition of mulberry leaf	3 hrs.
7	Brief account of photosynthesis: Outline of the process; light reaction, types of carbon fixation (C3 and C4); brief account of photorespiration and its significance.	6 hrs.
8	Plant growth regulators: Importance and application in mulberry, agriculture and horticulture.	5 hrs.
9	Environmental factors; Role of environmental factors on mulberry growth.	2 hrs.
Unit-3		
10	Digestion: Nutritive requirements of the silkworm, midgut structure and function. Structure and function of digestive system; digestive enzyme; process of digestion.	4 hrs.
11	Respiration: tracheal systems- spiracles, mechanism of respiration, factors affecting respiration.	4 hrs.
12	Excretion: structure and function of excretory system and cryptonephridial arrangement and its significance in water regulation.	4 hrs.
13.	Neuro-endocrine system: Nervous system; Structure and distribution of endocrine glands; role of nervous system in endocrine function	4 hrs.
Unit-4		
14	Sense organs: Photoreceptors, Chemoreceptors and Mechanoreceptors.	3 hrs.
15	Circulation: heart beat-role of alary muscles; accessory hearts; blood pressure in open circulatory system. Haemolymph.	3 hrs.
16	Reproduction: Male and female reproductive systems in insects; role of accessory glands; oviposition.	3 hrs.
17	Muscle Physiology: Histology of insect muscles, flight muscles in insects, ultra structure of skeletal muscle, mechanism of muscle contraction.	3 hrs.
18	Integument: Structure, formation and function.	2 hrs.
19	Metamorphosis- types of insect metamorphosis, theories of metamorphosis.	2 hrs.

DSC - (SER) D: PHYSIOLOGY OF MULBERRY AND SILKWORM		
Practical		16 Practicals of 4 hrs. each
1	Determination of stomatal index	1 Prac.
2	Kranz Anatomy in relation to photosynthesis.	1 Prac.
3	Estimation of leaf protein	1 Prac.
4	Separation of leaf photosynthetic pigments of mulberry through paper chromatography.	1 Prac.
5	Extraction of photosynthetic pigments by solvent wash method.	1 Prac.
6	Determination of water potential of potato tubers	1 Prac.
7	Estimation of mulberry leaf moisture percentage and retention capacity of any two mulberry varieties.	1 Prac.
8	Hill reaction.	1 Prac.
9	Estimation of proteins in haemolymph/egg.	1 Prac.
10	Estimation of haemolymph glucose level.	1 Prac.
11	Morphology of haemocytes in silkworm.	1 Prac.
12	Estimation of amylase activity in haemolymph of bivoltine and multivoltine races/breeds.	1 Prac.
13	Estimation of SDH activity in the eggs/tissue.	2 Prac.
14	Estimation of glycogen in fat body/ovary of silkworm.	1 Prac.
15	Estimation of uric acid in silkworm litter.	1 Prac.
SCHEME OF PRACTICAL EXAMINATION		
Duration-3hrs.		Max. Marks-80
Q1	Separation of photosynthetic pigments/ water holding capacity of potato tubers/ Stomatal Index/ Estimation of protein in mulberry. Note: Distribution of marks a) Procedure - 5 b) Labeled diagramme/flowchart - 5 c) To conduct Experiment - 10	20 marks
Q2	Estimation of haemolymph protein / glucose / amylase / succinate dehydrogenase / glycogen / uric acid. Note: Distribution of marks a) Procedure - 5 b) Calculation/graph - 5 c) To conduct Experiment - 10	20 marks
Q3	Submission of fieldwork/field visit/rearing report.	10 marks
Q4	Identify and comment on the spots A, B, C and D. (any four from the practical syllabus/ 5 marks for each)	20 marks
Q5	Viva-voce: (any five questions from the practical syllabus)	10 marks

V SEMESTER		
DSE – (SER) A (1): MULBERRY & SILKWORM BREEDING AND SEED TECHNOLOGY		
Theory		4 hrs/week x 16 weeks = 64 hrs.
Unit-1		
1	Germplasm bank: Importance; collection, characterization and maintenance.	2 hrs.
2	Plant introduction and acclimatization; Quarantine.	2 hrs.
3	Mulberry breeding: Objectives; methods of breeding; selection methods.	2 hrs.
4	Hybridization technique and selection.	4 hrs.
5	Polyploidy breeding and Mutation breeding.	2 hrs.
6	Breeding for disease and Drought resistance.	2 hrs.
7	Evaluation of selected genotypes and release of improved varieties.	2 hrs.
Unit-2		
8	Silkworm germplasm bank.	1 hr.
9	Sex determination mechanism in silkworm- importance of ZZ and ZW chromosomes; sex-limited races.	2 hr.
10	Genetic of voltinism and moultinism in the silkworm, <i>Bombyx mori</i> . Hormonal control of voltinism and moultinism inheritance.	2 hrs.
11	Silkworm breeding: objectives - inbreeding and out breeding concepts- Different methods of breeding- selection, line breeding, cross breeding and mutation breeding.	3 hrs.
12	Hereditary traits of silkworm egg, larva, pupa and adult.	3 hrs.
13	Genetics of cocoon colours- inheritance of cocoon colours.	2 hr.
14	Heterosis/hybrid vigour-exploitation of heterosis-concept of single, double & polyhybrids.	4 hrs.
Unit-3		
15	Silkworm seed organization, significance of seed organization; Basic seed multiplication centres-P4, P3, P2 and P1; Seed areas- identification; concept.	4 hrs.
16	Concept of selected seed rearers/villages- Seed Legislation Act- maintenance of seed crops.	2 hrs.
17	Seed cocoon markets- pupal examination, certification of seed cocoon lots- price fixation for seed cocoons.	2 hrs.
18	Disinfection and hygiene in seed production units.	2 hrs.
19	Seed production centres (grainages)- types of grainages- organisation and functions of grainages	2 hrs.
20	Plan for model grainage- grainage equipments and their use - Seed production plan.	2 hrs.
21	Procurement and transportation of seed cocoons- processing and preservation of seed cocoons- sex separation in seed cocoons.	2 hrs.
Unit -4		
22	Moth emergence and synchronization; sex separation in moth; effect of improper synchronization on egg hatching and quality-safe duration.	3 hrs.
23	Coupling and decoupling; oviposition; method of egg production; refrigeration of male moths; mother moth examinations- individual and mass methods- dry moth examination; environmental conditions for grainage activity.	3 hrs.
24	Egg disinfection- handling of multivoltine eggs- preservation of eggs to postpone hatching-ideal embryonic stages for cold storage- maximum duration of cold storage. Handling of bivoltine eggs for early hatching- physical and chemical methods- hot and cold acid treatment.	4 hrs.
25	Postponement of hatching; hibernation schedule for 3, 4, 6 and 10 month's duration.	1 hrs.
26	Preparation of layings and loose egg- advantages- handling of loose eggs.	2 hrs.
27	Incubation of eggs-methods, environmental conditions required for incubation, postponement of hatching of eggs by temporary consignment.	2 hrs.
28	Grainage management-Role of LSPs. Bye products of grainage and their utilization.	1 hr.

DSE - (SER) A (1): MULBERRY & SILKWORM BREEDING AND SEED TECHNOLOGY

Practical

16 Practicals of 4 hrs. each

1	Mulberry germplasm and Mulberry multilocational trials (field visit)	1 Prac.
2	Evaluation of breeding parameters in different mulberry varieties.	2 Prac.
3	Hybridization technique in mulberry.	1 Prac.
4	Study of different strains of cocoons- NB ₄ D ₂ , KA, PM, C. Nichi, Nistari, CSR ₂ and CSR ₄ race/ breeds characters.	1 Prac.
5	Mutants of silkworm larva- zebra, urasa, knobbed and sex-limited Races.	1 Prac.
6	Comparative assessment of the hybrids and pure race cocoons.	1 Prac.
7	Model grainage plan and Grainage equipments.	2 Prac.
8	Seed cocoon processing/handling- deflossing, sorting and preservation- pupal examination and Sex separation of pupa and moth. Synchronization of emergence.	1 Prac.
9	Moth emergence- selection of moths- pairing and de-pairing- oviposition- preservation of male moths- preparation of disease free layings- sheet egg and loose egg preparation- Treatment of eggs with acid-Weighing and packing.	2 Prac.
10	Pupa and Mother moth examination for Pebrine spores- Individual and Mass moth examination- surface disinfection, preservation. hibernation schedules for 3, 4, 6 and 10 month.	1 Prac.
11	Acid treatment of bivoltine eggs- hot acid and cold acid treatment. Incubation of acid treated eggs.	1 Prac.
12	Visit to Germplasm banks, Seed cocoon markets, grainage and cold storage center.	2 Prac.

NOTE: Silkworm Seed Preparation Experiment should be conducted and certified report should be submitted during examination.

SCHEME OF PRACTICAL EXAMINATION

Duration-3 hrs.

Max. Marks-80

Q1	Evaluation of mulberry breeding genotypes/parameters	20 marks
	Note: Distribution of marks.	
	a) Identification of the variety with classification - 3	
	b) Taxonomic features - 12 c) Labeled Diagram - 5	
Q2	Cocoon assessment/sex separation of pupa/moth stages	20 marks
	Note: Distribution of marks	
	a) Procedure - 5	
	b) To conduct experiment and calculation - 10 c) Labeled diagram and Identification - 5	
Q3	Cold/hot acid treatment of silkworm eggs/ Pupa/Mother moth examination.	10 marks
	Note: Distribution of marks	
	a) Procedure - 5 b) Experiment with diagram - 5	
Q4	Identify and comment on the spots A, B, C and D. (any four from the practical syllabus/5 marks for each)	20 marks
Q5	Report submission	05 marks
Q6	Viva-voce: (any five questions from the practical syllabus)	05 marks

DSE – (SER) A (2): AGRONOMY AND ENTOMOLOGY		
Theory	4 hrs/week x 16 weeks = 64 hrs.	
Unit-I		
1	Soil formation: Soil forming factors, influence of soil forming (weathering) factors and soil profile and classification.	4 hrs.
2	Properties of soil: Physical - structure, texture, colour, permeability, bulk and particle density and porosity; chemical - pH, electrical conductivity, organic carbon, ionic exchange; biological – micro and macro organisms.	4 hrs.
3	Soil water and air: Importance - physical and biological classification of soil water – soil moisture constants and drainage.	4 hrs.
4.	Soil types in India. Problematic soils and their reclamation. Soil fertility and productivity. Soil sampling and soil testing.	4 hrs.
Unit – II		
5	Basic principles of crop production; classification of crops; methods of crop production; farming systems; planting seasons.	4 hrs.
6	Plant nutrient management: Essential plant nutrients – uptake and deficiency symptoms, organic manures, inorganic fertilizers and biofertilizers – importance, classification and application; foliar nutrition, Integrated nutrient management. Composting and vermicomposting.	6 hrs.
7	Irrigation management: Sources, methods and schedules; conservation of soil moisture in dry land farming.	2 hrs.
8	Weed management – methods. Farm management – principles and concepts.	4 hrs.
Unit – III		
9	Characteristic features of insects. Insects in the service of man and insects as enemies of man.	2 hrs.
10	Insect pests: Definition, origin, categories and types; pest forecasting and outbreak. Symptoms and injuries caused by insect pests; ETL and EIL.	4 hrs.
11	Insect pests of agricultural crops: Cereals, pulses, oilseeds and stored grains. Insect pests of horticultural crops: Vegetables, fruits and plantation crops.	6 hrs.
12	Insect pests of farm animals: Blood sucking flies, myiasis flies, lice and fleas; arachnids. Insect pests of public health importance - mosquitoes, houseflies, sandflies, lice, bedbugs and ratfleas.	4 hrs.
Unit-IV		
13	Insect pest control: General considerations and prior information.	2 hrs.
14	Natural control of insect pests: Climatic factors, natural barriers, natural enemies and diseases.	4 hrs.
15	Applied control of insect pests: Cultural, mechanical, physical, biological, genetical/autocidal, legal, microbial, pheromonal, hormonal and chemical methods.	6 hrs.
16	Integrated pest management – goals, principles and concepts, components and benefits.	4 hrs.

DSE – (SER) A (2): AGRONOMY AND ENTOMOLOGY		
Practical	16 Practicals of 4 hrs. each	
1	Study of agricultural implements and machinery.	1 Prac.
2	Soil sampling and testing.	1 Prac.
3	Composting and vermicomposting.	1 Prac.
4	Study of manures, fertilizers and bio-fertilizers, calculation of NPK dosage.	2 Prac.
5	Study of nutrient deficiency symptoms in crop plants.	1 Prac.
6	Study of drip and sprinkler irrigation systems.	1 Prac.
7	Study of characteristic features of important weeds.	1 Prac.
8	Collection and identification of insects belonging to orders: Lepidoptera, Coleoptera, Orthoptera, Diptera, Hymenoptera and Homoptera.	2 Prac.
9	Collection and methods of insect preservation.	1 Prac.
10	Studies on life cycle of harmful insects: Agricultural and horticultural crops.	2 Prac.
11	Studies on life cycle of harmful insects: Farm animals and public health.	2 Prac.
12	Planning the facilities required for establishment of insectary. Production of bio-control agents - insect parasitoids and predators.	1 Prac.

SCHEME OF PRACTICAL EXAMINATION		
Duration-3 hrs	Max. Marks – 80	
Q1	Collection and preparation of soil sample in the field / Calculation of fertilizers requirement (as per recommended NPK dose) for a given area of irrigated or rain fed mulberry garden and given type of fertilizers.	20 marks
	Note: Distribution of marks	
	a) Procedure – 10 marks. b) Collection / Calculation – 10 marks.	
Q2	Assign the given insect pests / parasitoids to their respective taxonomic group and write on their life cycle and importance.	20 marks
	Note: Distribution of marks	
	a) Identification – 5 marks. b) Life cycle and importance – 15 marks.	
Q3	Identify and comment on the spots A, B, C, D and E. Any FIVE from the practical syllabus.	20 marks
Q4	Submission of field work / visit report.	10 marks
Q5	Viva-voce: (any five questions from the practical syllabus)	10 marks

SKILL ENHANCEMENT COURSE (SEC) FROM SERICULTURE		
SEC – (SER) PAPER-1: SERICULTURE TECHNOLOGY		
Theory	2 hrs/week X 16 Weeks = 32 hrs	
Unit-1		
1	Introduction to Sericulture-Origin and history of Sericulture. Components of sericulture.	1 hr.
2	Establishment of mulberry garden under rain-fed and irrigated conditions. Spacing.	1 hr.
3	Package of practices for mulberry under irrigated and rainfed conditions.	2 hrs.
4	Manuring: Soil sampling and testing, NPK requirements. Intercropping, composting.	2 hrs.
5	Irrigation: Importance, and methods. Conservation of soil moisture.	1 hr.
6	Leaf harvesting: harvesting; transportation and preservation.	1 hr.
Unit-2		
		3 hrs.
7	Diseases of mulberry: Occurrence, symptoms and preventive and control measures of powdery mildew, leaf spot, leaf rust, root rot and stem canker.	3 hrs.
8	Root-knot disease of mulberry- occurrence, symptoms, preventive and control measures.	1 hr.
9	Major pests of mulberry: Leaf roller, Bihar hairy caterpillar, mealy bug and thrips – Nature of damage, preventive and control measures. Pest outbreak; pest forecasting.	3 hrs.
10	Minor pests: nature of damage, preventive and control measures.	1 hr.
Unit-3		
11	Rearing house: model rearing house. Rearing appliances.	1 hr.
12	Disinfection of rearing house and appliances; disinfectants, rearing and personal hygiene.	1 hr.
13	Introduction to silkworm seed production, silkworm breeds for rearing. Incubation of eggs and black boxing.	2 hrs.
14	Chawki rearing: Brushing; optimum environmental conditions; methods and frequency of feeding; methods of bed cleaning; spacing; moulting and care during moult.	2 hrs.
15	Late age silkworm rearing: Methods; optimum environmental conditions; feeding quantity and frequency; methods of bed cleaning; spacing; moulting and care during moult.	1 hr.
16	Identification and mounting of spinning larvae; types of mountages and environmental requirements during spinning. Harvesting, sorting packing and transport of cocoons.	1 hr.
Unit-4		
17	Introduction to silkworm diseases. Protozoan disease – symptomatology, structure of pebrine spore, source, mode of infection and transmission, prevention and control	2 hrs.
18	Bacterial diseases - causative agents, symptoms, mode of infection and transmission, prevention and control.	1 hr.
19	Viral diseases (grasserie, infectious flacherie and cytoplasmic polyhedrosis)- causative agents- symptoms – mode of infection and prevention and control.	2 hrs.
20	Fungal diseases: white and green muscardine and aspergillosis- causative agents- symptoms - prevention and control.	1 hr.
20	Indian uzifly; life cycle, nature and extent of damage; prevention and control; integrated management.	1 hr.
22	Dermestid beetle - life cycle; nature of damage; prevention and control measures. Predators of silkworm: prevention and control measures.	1 hr.

VI SEMESTER		
DSE – (SER) B (1): SILK TECHNOLOGY, VANYA SERICULTURE AND EXTENSION		
Theory		4 hrs/week x 16 weeks = 64 hrs.
Unit-I		
1	Physical and commercial characteristics of cocoons. Sorting of Cocoon.	2 hrs.
2	Cocoon marketing; transaction and procedure.	2 hrs.
3	Cocoon stifling: Definition, objectives, different methods-conventional and modern techniques- steam stifling. Hot air drying- Batch type and conveyer type.	2 hrs.
4	Cocoon cooking/boiling: Definition and objectives, different methods of cocoon boiling- Mono pan, three pan and pressurized cocoon boiling methods.	2 hrs.
5	Cocoon brushing: Definition and objectives; methods of brushing.	1 hr.
6	Reeling water: quality required for silk reeling, hardness, pH; corrective measures.	2 hrs.
7	Reeling: Objective; reeling on country charaka, cottage basin, multi end reeling machine, auto and semi-automatic, improved CSTRI reeling devices.	3 hrs.
8	Re-reeling and packing: Objectives, process; lacing, skeining, booking and baling.	2 hrs.
Unit-II		
9	Textile fibres: Raw silk properties- physical, chemical and biological. Uses of raw silk.	2 hrs.
10	Silk exchange; transaction and procedure, KSMB and KSIC.	2 hrs.
11	Raw silk testing and grading; Visual inspection. Mechanical tests; Supplementary tests-conditioning weight, scouring loss and exfoliation tests.	2 hrs.
12	Silk throwing: Introduction, objectives; soaking, winding, doubling, twisting, rewinding.	2 hrs.
13	Silk weaving: Warp preparation, Weft preparation; pirn winding methods. Powerloom and handloom weaving and differences. Flow chart of weaving; weaving defects.	3 hrs.
14	Chemical processing of silk yarns and fabric: Degumming- methods. Silk bleaching; Silk dyeing-Acidic and basic dyeing processing; dyes and chemicals used for silk dyeing.	2 hrs.
15	Spun silk industry- various steps involved, flow chart, spun silk yarn and noil yarn.	2 hrs.
16	Introduction to by-products of sericulture industry and their utilization.	1 hr.
Unit-III		
17	Non-mulberry silkworms - their distribution in India and other countries.	2 hrs.
18	Taxonomy and cultivation of <i>Terminalia arjuna</i> , <i>Machilus bombycina</i> and <i>Ricinus communis</i> .	3 hrs.
19	Life cycle of Tasar, Eri and Muga silkworms.	2 hrs.
20	Important diseases and pests of primary food plants and their management.	2 hrs.
21	Rearing of non-mulberry silkworms. Ecological conditions required- improved rearing methods for young and late age tasar, eri and muga silkworms. Mounting methods.	3 hrs.
22	Seed cocoons- Procurement, preservation and production of disease free eggs of tasar, eri and muga.	2 hrs.
23	Diseases of non-mulberry silkworms- protozoan, bacterial, viral and fungal diseases. Symptoms- causative agents-preventive and control measures.	2 hrs.
Unit-IV		
24	Extension education- meaning, objectives and importance, principles and concepts.	2 hrs.
25	Extension programmes- concepts and principles, role of extension personnel and farmers in programme planning Transfer of technology.	2 hrs.
26	Communication- definition, types. Training- concepts and definition- methods	2 hrs.
27	TSC's and Co-Operative chawki rearing centers: Role and Importance.	3 hrs.
28	Mulberry cultivation–Cost and returns under irrigation and rainfed condition.	2 hrs.
29	Economics of egg production: Expenditure and income	2 hrs.
30	Economics of silkworm rearing: Investment and returns.	1 hr.
31	Economics of silk reeling: Cost and returns for different types of reeling establishments.	2 hrs.

DSC - (SER) B (1): SILK TECHNOLOGY, VANYA SERICULTURE AND EXTENSION		
Practicals		16 Practicals of 4 hrs. each
1	Categorization of different types of cocoons- good and defective cocoons- calculation of percentage of each type.	1 Prac.
2	Cocoon stifling- Determination of degree of drying. Reeling water: Determination of total and permanent hardness, alkalinity and pH.	1 Prac.
3	Cocoon cooking- different methods (mono pan and three pan demonstration)	1 Prac.
4	Determination of commercial characters of cocoon-average cocoon weight, shell weight, shell percentage or shell ratio, average filament length, reelability, raw silk recovery, renditta and denier; reeling on eprouvette.	1 Prac.
5	Identification of silk, cotton, wool and synthetic fibre (viscose/nylon/polyester) by physical method- flame and microscopic test, chemical and confirmatory tests.	1 Prac.
6	Degumming of cocoon shell/raw silk by soap & soda method and estimation of sericin and fibroin percentage.	1 Prac.
7	Bleaching of silk fibers. Silk dyeing to obtain different shades using acid dye stuff.	1 Prac.
8	Identification of different types of silk waste; floss, cooker, reeler, basin refuse and re-reeling waste, dupion silk.	1 Prac.
9	Taxonomic features of non-mulberry food plants (eg: <i>Terminalia arjuna</i> , <i>Terminalia catapa</i> , <i>Ricinus communis</i> , <i>Michelia champaca</i> , <i>Quercus</i> sp., <i>Bauhinia vareigata</i> and <i>Manihot utilissima</i> etc.,).	2 Prac.
10	Life cycle and morphology of tasar silkworm egg, larva, pupa, cocoon and moths, Rearing and grainage appliances used.	1 Prac.
11	Life cycle and morphology of Muga silkworm egg, larva, pupa, cocoon and moths, Rearing and grainage appliances used.	1 Prac.
12	Life cycle and morphology of Eri silkworm egg, larva, pupa, cocoon and moths, Rearing and grainage appliances used.	1 Prac.
13	Preparation of audio visual aids- Flash cards, posters, hand outs and pamphlets.	1 Prac.
14	Presentation of statistical data- Bar chart and graph, pie chart of raw silk and cocoon production, area under mulberry cultivation, import and exports.	2 Prac.
NOTE: Visit to reeling units/filatures/TSC/CRC/institutes-Report submission during examination.		
SCHEME OF PRACTICAL EXAMINATION		
Duration-3 hrs.		Max. Marks-80
Q1	Estimation of filament length/ reelability/ raw silk % recovery/ renditta/denier (any two) from the given cocoons (OR) Identification, sorting and percentage determination of different types of cocoons (OR) Estimation of fibroin and sericin % from the cocoon shell / raw silk. Note: Distribution of marks a) Procedure - 05 b) To conduct Experiment - 10 c) Calculations - 05	20 marks
Q2	Assign the given food plants of non mulberry silkworms to its respective family. Note: Distribution of marks a) Identification and classification -03 b) Taxonomical description -10 c) Diagrams with sericulture importance -07	20 marks
Q3	Preparation of bar charts/ graphs/ pie charts/ posters/ flashcards/ handouts/ pamphlets (OR) Identification of textile fibres. Note: Distribution of marks a) Procedure/ identification -03 b) Experiment -05 c) Diagrams -02	10 marks
Q4	Identify and comment on the spots A, B, C and D. (any four from the practical syllabus/ 5 marks for each)	20 marks
Q5	Report submission	05 marks
Q6	Viva-voce: (any five questions from the practical syllabus)	05 marks

DSE – (SER) B(2): ENTREPRENEURSHIP DEVELOPMENT IN SERICULTURE		
Theory		4 hrs/week x 16 weeks = 64 hrs.
Unit-I		
1	Entrepreneurship development programme (EDP): Emergence and objectives of EDP, essential qualities to become an entrepreneur; selection of a potential entrepreneur.	4 hrs.
2	Planning for EDP: Objectives, selection of a centre, purpose of pre-training promotional work.	3 hrs.
3	Follow-up for EDP: Need, extent and mechanism; facilitating follow-up; approach to competence development.	3 hrs.
4	Project formulation (project appraisal): Meaning and purpose, personnel / agencies interested in project appraisal, market feasibility of the project, technical and market analysis, means of finance, profitability, risk analysis and liquidity management; agencies supporting sericulture projects.	4 hrs.
5	Marketing: Approach and essence; market assessment – demand; steps involved in market study.	2 hrs.
Unit-II		
6	EDP in raising mulberry saplings (Kisan nursery).	3 hrs.
7	EDP in organization of chawki rearing centers.	3 hrs.
8	EDP in silkworm egg production and rearing.	3 hrs.
9	EDP in silk reeling – charaka, cottage basin and multi-end reeling units.	4 hrs.
10	EDP in preparation of handicrafts from cocoons.	3 hrs.
Unit-III		
11	Mass production of insect pathogens: Culturing of hosts / preparation of culture substrates, inoculation; isolation, purification and storage of pathogens.	4 hrs.
12	Mass production of parasitoids: Culturing of host insects, oviposition of parasitoids, emergence, collection, feeding and storage of parasitoid adults.	4 hrs.
13	Mass production of insect predators: Culturing of prey insects, release of adults of predators on the colony of prey insects, collection, feeding, storage of predator adults.	4 hrs.
14	EDP in composting and vermicomposting for the management of mulberry garden and rearing wastes.	4 hrs.
Unit-IV		
15	Mechanization: Objectives, principles, technology and productivity, characteristic features, advantages and limitations.	3 hrs.
16	Mechanization in mulberry cultivation, silkworm egg production and silkworm rearing - activities, scope and economics.	4 hrs.
17	Advances in silk reeling technology - activities, scope and economics.	4 hrs.
18	Contract farming and its scope in sericulture.	3 hrs.
19	Occupational health hazards in sericulture.	2 hrs.

DSE – (SER) B(2): ENTREPRENEURSHIP DEVELOPMENT IN SERICULTURE		
Practicals		16 Practicals of 4 hrs. each
1	Planning the facilities required for establishment of insectary.	1 Prac.
2	Observations on insect pathogens and symptoms.	1 Prac.
3	Observations on insect parasitoids and predators.	1 Prac.
4	Planning for raising mulberry saplings (Kisan nursery) and vermicomposting.	1 Prac.
5	Planning for establishment of chawki rearing centers.	1 Prac.
6	Planning for establishment of silkworm egg production centres.	1 Prac.
7	Planning for establishment silk reeling - charka, cottage basin and multi-end reeling units.	2 Prac.
8	Assessment of Benefit – Cost ratio under traditional and mechanized systems of mulberry cultivation and silkworm egg production.	1 Prac.
9	Assessment of Benefit – Cost ratio under traditional and mechanized systems of silkworm rearing and silk reeling units.	1 Prac.
10	Visit to units for mass production of parasitoids and predators.	2 Prac.
11	Visit to grainage / silk reeling units to study the health related problems among the concerned personnel.	2 Prac.
12	Visit to chawki rearing centres.	2 Prac.
	A report shall be submitted at the end of the course for evaluation.	
SCHEME OF PRACTICAL EXAMINATION		
Duration-3 hrs		Max. Marks – 80
Q1	Write on the EDP of Kisan nursery / silkworm rearing / egg production / silk reeling and its importance.	20 marks
	Note: Distribution of marks	
	a) Procedure – 12 marks b) Importance – 8 marks.	
Q2	Prepare a project plan for establishment of chawki rearing centres (capacity: 10 Lakhs dfls brushing per year)	20 marks
	Note: Distribution of marks	
	a) Requirements – 8 marks b) Plan – 12 marks.	
Q3	Identify and comment on the spots A, B, C, D and E. Any FIVE from the practical syllabus.	20 marks
Q4	Submission of field work / visit report.	10 marks
Q5	Viva-voce: (any five questions from the practical syllabus)	10 marks

SKILL ENHANCEMENT COURSE (SEC) FROM SERICULTURE		
SEC – (SER) PAPER-2: SILK TECHNOLOGY		
Theory	2 hrs/week X 16 Weeks = 32 hrs.	
Unit-1		
1	Introduction to different textile fibres.	1hr.
2	Physical and commercial characteristics of cocoons.	2hrs.
3	Cocoon marketing - Government cocoon markets, purchase of cocoon in open auction; grading of cocoons- visual inspection and selection.	2hrs.
4	Cocoon sorting: Objectives and procedure, types of defective cocoons.	1hr.
5	Cocoon stifling: Objectives and methods-conventional and modern techniques. Conditioning and preservation of stifled cocoons.	2hr.
Unit-2		3hrs.
6	Cocoon cooking: Objectives and methods - mono pan, three pan and pressurized.	2hrs.
7	Cocoon brushing: Objectives; methods- hand and mechanical brushing.	1hr.
8	Reeling water: Quality required for silk reeling total and permanent hardness,optimal pH; corrective measures.	1hr.
9	Reeling: Objectives and devices-country charaka, cottage basin, multi end reeling machine, auto and semi-automatic, improved CSTR reeling devices; advantages and disadvantages.	3hr.
10	Re-reeling and packing: Objectives, process; lacing, skeining, booking and bale making.	1hr.
Unit-3		
11	Raw silk properties- physical, chemical and biological. Uses of raw silk	1hr.
12	Raw silk testing and grading; Objectives and visual inspection and mechanical tests.	2hrs.
13	Silk throwing: Introduction, objectives soaking, winding, doubling, twisting, heat/steam setting, rewinding.	3hrs.
14	Silk weaving: Warp preparation- warp and weft preparation - Powerloom and handloom weaving.	2hrs.
Unit-4		
15	Chemical processing of silk yarns and fabric: Objectives of degumming and methods. Silk dyeing- acidic and basic dyeing processing, different classes of dyes and chemicals used for silk dyeing.	3hrs.
16	Spun silk industry- steps involved, flow chart, spun silk yarn and noil yarn.	2hrs.
17	Silk finishing: Objectives, methods- Mechanical and chemical finishing.	1hr.
18	By-products of sericulture industry and their utilization.	2hrs.

INTERNAL ASSESSMENT

For Theory

C1 = One assignment / presentation (5 marks) and one test (5 marks)

C2 = One assignment / presentation (5 marks) and one test (5 marks)

For Practical

C1 = Performance of student at every practical (2.5 marks) / field work or test (2.5 marks)

C2 = Performance of student at every practical (2.5 marks) / practical record (2.5 marks)

QUESTION PAPER PATTERN (THEORY: C3 EXAMINATION)

I-VI SEMESTER

Sl. No	Type of question	Marks / Question	No. of Questions to be asked	No. of Questions to be answered	Total
1	Define / Mention / Expand, etc. - the following	1	05	05	05
2	Write short notes on the following	3	07	05	15
3	Give brief answers on the following	5	08	06	30
4	Write in detail / explain the following	10	04	03	30
Total					80

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