APPGCET -2021: SYLLABUS
TEST NAME: 303 – SERICULTURE

Section 1:

TAXONOMY & ANATOMY OF MULBERRY: Botanical Description and taxonomical characters of Mulberry Varieties and Species- Anatomy of Root (Primary & Secondary), Stem (Primary & Secondary), Petiole and leaf- Influence of Environment on Mulberry growth and development- Soil- Physical and Chemical Properties of soils, soil texture, soil structure and their classification in relation to mulberry growth red loamy soils, clay soils, sandy soils and black soils.

MULBERRY PROPAGATION: Asexual Propagation or Vegetative Propagation-propagation by cuttings-Grafting- Stem, Bud and root grafting-Layering- Simple, Air, Trench-Sexual Propagation through seeds and seedlings preparation-Nursery Technology.

MULBERRY PRODUCTION & MANAGEMENT -I: Factors of soil for mulberry growth -Mulberry cultivation. Selection of the Land- Preparation of the Land-Planting material-Methods of Planting-a) Pit system, b) Row system-Irrigation methods- Flatbed method, basin method, furrow method, sprinkler or over head method, drip irrigation-Manuring.

MULBERRY PRODUCTION &MANAGEMENT - II: Inter Cultivation and Weeding, Systematic position of Common weeds of mulberry garden, Preventive & Control measures. Integrated Weed Control.-2. Methods of pruning- low cut, high cut, and middle cut, Head and non-head type of pruning-3. Methods of leaf harvest- leaf picking, branch harvest and whole shoot harvest- Preservation.

PHYSIOLOGY & GROWTH OF MULBERRY: Brief Account of Photosynthesis; Carbon Fixation and their relation to leaf quality and productivity-Chemical Composition of Mulberry leaf. In relation to environmental conditions, soil conditions, cultural practices-Plant Nutrition- A. Macronutrients; Micronutrients their role in growth and respective deficiency syndromes-Growth regulating substances and their application in improvement of mulberry.

Section 2:

EMBRYOLOGY:- Sporogenesis- Microsporogenesis- Development of microspores; Megasporogenesis -Development of megaspores-Fertilization-Embryo Development-Polyembryony; Parthenogenesis; Parthenocarpy.

CYTOLOGY, GENETICS, BREEDING OF MULBERRY

Cytological aspects of Mulberry-Brief account of Mendelian genetics, selection, scope and methods.Collectionand maintenance of Germplasm Bank.Breeding of Mulberry-Plant introduction and acclimatization.Hybridization-Scope, application and limitationsPolyploidy- Euploidy, Aneuploidy, Introduction of Polyploidy and their significance.Mutations-Natural, Induced-Techniques, applications, Limitations.

BIOTECHNOLOGY IN MULBERRY:

Introduction and Scope of biotechnology in mulberry improvement Biofertilizers –Bio-fertilizers and their application in mulberry cultivation, methods of application, scope and limitation.

Vermi Technology. Mulching: Mulches and their significance in soil conservation -Tissue Culture – Tissue culture techniques in mulberry anther/ pollen culture, callus culture, somoclonal variants, somatic, hybrid in *vitro* screening cryopreservation.

DISEASES & PESTS OF MULBERRY, INTEGRATED PEST MANAGEMENT (IPM):

Introduction to Plant diseases:
Foliar Diseases- Powdery mildew- Rust- Leaf Spot; D.Tukra.
Stem Diseases- Trunk rot-. Dogare blight-
Root Diseases- White root-rot. Violet root-rot Root-Knot.
Prevention and Control of Mulberry Diseases

Pest Attack on Mulberry:
Identification of different types of leaf eating caterpillars, Jassids, Mealy Bugs, Thrips, Scale Insects, Beetles, Nature of damage, Preventive and control measures. Common Pesticides, Chemical nature, Mode of action. Integrated Pest Management methods.

RESOURCE MANAGEMENT & ECONOMICS OF MULBERRY
Water management and Watershed management concept – significance of water recharging technologies-Intercropping and uses for soil management - Economics of mulberry cultivation – Bye – products of mulberry and their industrial use

Section 3:

SYSTEMATICS & SILKWORM BIODIVERSITY: Systematic position of Mulberry and Non mulberry silkworms in the animal kingdom (Taxonomic Classification)-Kinds of Silkworms & geographical distribution (Mulberry and Non Mulberry Silkworms) -Life cycle (Holometabola) of silkworm – egg stage, larva stage, pupa stage and adult stage.

SILKWORM ANATOMY AND PHYSIOLOGY: Morphology of Silkworm Egg, Larva, Pupa & Moth. Anatomy of Silkworm larva-Digestive System, Excretory System , Respiratory, Circulatory and Central Nervous System and Silk glands Male and Female reproductive system. - Introduction, Structure and functions of Endocrine Glands (Brain, Corpora allatum, Prothoracic gland, Corpora cardiaca & Sub oesophageal ganglion).

THE SILKWORM AND THE ENVIRONMENT: Introduction of silkworm rearing
Rearing Equipment - rearing stand, rearing trays, ant wells, paraffin papers, foam rubber pads, chopsticks, feathers, chopping boards, leaf chambers, cleaning nets, mountages - Disinfection of rearing house - methods, eco-friendly disinfectants-Precautions during disinfection - Rearing and Impact of Environmental factors.

INCUBATION AND PRESERVATION OF SILKWORM EGGS: Preparatory Work for Incubation of Silkworm Egg Development of Silkworm Embryo-Environmental conditions for Incubation-Technical Management in Incubation-Preservation of eggs for initiation of rearing.

PRINCIPLES AND BV&MV SILKWORM REARING MANAGEMENT
Rearing of Chawki Silkworms: Paraffin Paper method-Box rearing Cooperative Rearing-Scientific Rearing Technology - Brushing, feeding, bed cleaning, spacing-Moulting and care during moulting-Adult Silkworm Rearing Methods - Mounting-Methods-Various Mountages, Spinning and Harvesting

Section 4:

SILKWORM SEED TECHNOLOGY: Grainage introduction: Indian sericulture scenario in egg production - Grainage system in A.P - Model Grainage - Grainage Equipment - Economics of Egg – Production.

SILKWORM SEED COCOON PROCESSING: Grainage activities(Hybrid Disease free egg laying): Disinfection of grainage - P1 Seed cocoon procurement and transportation of seed cocoons - Cocoon Sorting and Cocoon arrangements - Sex Separation, Moth

Emergence & Synchronization of moth emergence, Pairing & De - pairingOviposition, Refrigeration of Male moths- Pupal gut examination - Moth Examination: (Individual, Sampling and Mass Moth examination Artificial hatching - Hot and Cold Acid Treatment - Postponement of hatching by Chilling - Hibernation and Incubation of Eggs.

SEED ORGANIZATION: Objectives of seed organization - Types of cocoon production areas -Industrial cocoon production areas - seed cocoon production areas -
P4 Stations (Evolution of new silkworm breeds) - P3 Stations (Basic Seed Farms) - P2 Stations (Seed Multiplication Farms) and P1 centers (Parent Seed Cocoon Production Centers)

SILKWORM PATHOLOGY: Introduction of Parasitism, Commensalism, Symbiosis and Parasite relationship - Mulberry Silkworm Diseases: Introduction, types, Pebrine, Grasserie, Muscardine, Flacherie, Symptoms and Pathogens, Mode of Infection, Prevention and Control -Non – mulberry silkworm diseases: Pebrine, Bacterial and viral diseases.

SILKWORM PESTS AND PREDATORS: Introduction, types of pests – Indian and Japan Uzi fly Life Cycle - Nature of Damage, Preventive and control measure and other pests Demisted beetles - Brief Account of Predators of Silkworms, Cockroaches, Ants, Beetles, Lizards, and Rodents - Nature of damage and control measures.

Section 5:

CYTOLOGY: Mitosis, Meiosis, Chromosome number in Mulberry and Non-Mulberry Silkworms – Gametogenesis,Oogenesis and Spermatogenesis

DEVELOPMENTAL BIOLOGY: Embryonic development-Cleavage-Blastoderm-germ band formation – Blastokinesis-Appendage formation-Organogenesis – Sex determination in silkworms.

GENETICS: Linkage and Crossing Over, Linkage Maps, factors influencing crossing over, Linkage groups – Parthenogenesis with reference to silkworm-types and methods, induction of parthenogenesis.Merits and limitations – Multiple alleles. Genetic control of Voltinism and Moultinism, relation between genes and hormones.

Genetics of cocoon colours: Mutations- Mutation – radiation and chemical mutagenesis – radiation sensitivity – types of chemical mutagens, importance of mutagens in induction of mutations.

BREEDING: Aim of Breeding, inbreeding, Inbreeding depression, out breeding, consequence of homozygocity – Selection-Hybridization- Heterosis-theories-manifestation of hybrid vigor. Evolution of new breeds, Sex Limited races – GeneticEngineering-Rdna technology-Transgenic Silkworms-Restriction Enzymes-Vectors Plasmids.

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