Code: TX Textile Technology

Engineering Mathematics

Linear Algebra: Matrices and Determinants, Systems of linear equations, Eigen values and Eigen vectors.

Calculus: Limit continuity and differentiability; Partial Derivatives; Maxima and Minima; Sequences and series; Test for convergence; Fourier series

Vector Calculus: Gradient; Divergence and Curl; Line a; Surface and volume integrals; Stokes, Gauss and Green's theorems

Differential Equations: Linear and non-linear first order ODE's; Higher order linear ODE's with constant coefficients; Cauchy's and Euler's equations; Laplace transforms; PDE's- Laplace, heat and wave equations.

Probability and Statistics: Mean, median, mode and standard deviation; Ransom variable; Poisson, normal and binomial distributions; Correlation and regression analysis.

Numerical Methods: Solutions of linear and non-linear algebraic equations; integration of trapezoidal and Simpson's rule; single and multi-step methods for differential equations.

General Textile Technology

Textile Fibres: Classification of textile fibres, fibre properties, New fibres, Substrate & Geometry, Spinning of Man Made fibres and terms related, spinnerets, properties of cotton, wool, silk and bast fibres, comparison of natural and man-made fibres for production and properties, Spin finish, types of silk yarns, types of silk fabrics, Types of yarn (single, multi fold & Fancy),

Silk Technology: types of silks, production of Silk from Mulberry, rearing, reeling, throwing process, elements of quality in Silk

Yarn Count systems: Yarn Numbering systems, differences, conversion from one system to other

New and Unconventional Natural fibres: Organic, Bt, PALF, Bamboo, Maize, applications

Textile Testing: objectives, number of sample and sample preparation methods, Testing of fibres, yarns & fabrics for properties, interpretation of results using statistics, role of SHF, KESF, FAST, AFIS systems

Yarn Manufacture:

Blow Room: Cotton selection, Mixing and Blending, selection of openers and cleaners, parameters controlling quality, Modern developments in openers and Blow room

Carding Drawing: Objectives, elements, role played, setting, modern developments in Card and,

drawframe, quality control aspects

Comber and Simplex: Preparatory process to combing, selection of machines, quality control at comber; Simplex Objectives, elements, role played, setting, modern developments and quality control

Ring Frame and Post spinning: Objectives, elements, role played, setting, modern developments and quality control in Ring spinning; post spinning machines, selection.

Spin Plan: preparation of spin plan for cotton, blends and synthetics

Advanced yarn Manufacture: principles of open end spinning, selection criterion, elements and working of Rotor, DREF, and Airjet spinning

Texturing: principles and methods of texturing, application

Fabric Manufacture:

Winding: types of spinning packages, principles of winding, selection criterion, systems of yarn preparation, practical aspects, kinetics of winding, productivity of winding, quality control aspects and production planning

Warping: types of warping, selection criterion, practical aspects, practical aspects of sectional warping, productivity, quality control aspects and production planning.

Sizing: different methods of types of Sizing, elements of sizing machine, Size preparation and devices, Size ingredients and selection, calculation of concentration of size recipe, Quality control aspects, role of each zone, productivity of winding, quality control aspects and production planning

Post sizing: selection of heald, reed and drop wire, and their selection.

Loom shed: Weave preparatory plan, Introduction to Weaving, Loom specification and Loom(Shuttle) classification and elements and mechanisms, quality control and production aspects, Loom primary and secondary motions, shedding devices and sheds, Automatic weaving, Dobby and Jacquard shedding , box motions, practical problems, Timing of looms, setting of looms for different types of fibres and sorts,

Unconventional weaving: principles, selection criterion, working elements of Gripper projectile, Rapier, Airjet and Waterjet weaving, multiphase weaving, triaxial weaving.

Fabric structure, Knitting, Nonwovens and Textile wet Processing

Fabric structure: elements of fabric structure, representation, primary, secondary and special weaves, compound structures and their features.

Knitting: Principles of loop formation in latch, beard and compound needle in weft knitting, machine arrangement for rib, purl and interlock, methods of representation of knit structure, geometry of knits, elements of warp knitting, machine aspects, loop formation in latch, beard and compound needle, type

of warp knit structure, calculations in weft and warp knitting

Nonwoven fabrics: differences between woven, knitted and nonwoven, methods of nonwoven, selection, production of needle punched nonwoven, properties and applications

Textile wet processing: grey cloth inspection, method of water calculation, elements, process and parameters of singeing, desizing, scouring , bleaching, mercerizing and quality control aspects, dyeing and elements of dyeing, dyes and classification, dyeing methods, faults of dyeing, printing and its elements, methods of printing , print paste preparation and elements of print paste, role played by each element, printing machines, selection of printing methods; finishing elements and methods, types of finishes and machines used

Apparel Technology

Sourcing: Need, Scope, role played by Sourcing manager

Markers & Marker Planning: Need and scope of Markers, types, Marker making Methods (Manual and Automated), constraints on fabric width, checks and stripes, constraints on grain direction.

Spreading: Need, Objectives, requirements and methods of spreading, economic cut quantities, factors affecting economic cut quantities, computerized cut order planning

Cutting: Objectives, methods of cutting, Types of cutting machines and applications, study on computer controlled cutting machine, Role of CNC machines in cutting, Laser, water Jet and Plasma cutting. Stickering, Bundling, Dispatch

Sewing technology: Introduction to sewing machines, Types, Sewing Machine-components and functions of sewing machine. Embroidery machines – mechanism, stitch formation, Computer controlled embroidery sewing machine. Selection of Stitches & Stitching Mechanism: classification, Comparison of stitches and Its usage.Seams: definition, types of seams, Seam Finishes

Sewing threads: types, selection of sewing threads, sewing problems. Sewing thread consumption, work aids, Care labelling

Fusing technology: Need, methods, requirement of fusing process, fusing machinery. quality control in fusing. Pressing of garment and equipment.

Washing: Types, principles of laundering, different methods of washing, characteristics of washing machine

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