

**Karnataka Examinations Authority, Bengaluru - 560012**

**PGCET: 2024 – 25**

**Number of MCQ questions for PGCET is 100. Each question carry one mark.**

**Syllabus for PGCET in Textile Technology**

**(1) Engineering mathematics**

(i) Linear Algebra: Matrices and determinants, Rank of matrix, Systems of linear equations, Eigen values and

Eigen vectors.

(ii) Calculus: Limit, continuity and differentiability, Partial derivatives, Maxima and minima, Sequences and series, Test for convergence, Fourier series.

(iii) Differential Equations: Linear and nonlinear first order ODEs, higher order ODEs with constant coefficients, Cauchy's and Euler's equations, Laplace transforms, PDE- Laplace, heat and wave equations.

(iv) The concept of individual population and samples-Frequency distribution and its representation-Construction of frequency diagrams with applications, probability curves. Statistical measures and their practical applications. Measures of central tendency-different types of means, Measures of dispersion. Skewness, kurtosis.

(v) Random sampling errors, relations between samples and populations, confidence interval. Determination CI for means, SD and difference in mean and SD. The normal distribution, binomial and Poisson distributions.

**(2) C Programming for problem solving**

(i) Overview of C: Basic structure of C program, executing a C program, variable and data types, operators and expressions. Managing input and output operations, conditional branching and loops. Example programs. Finding roots of quadratic equation, computation of binomial coefficients, plotting of Pascal's triangle.

(ii) Arrays: Arrays (1D, 2D), character arrays and strings, basic algorithms, searching and sorting algorithms (linear search, bubble sort and selection sort).

**(3) Technical English**

(i) Introduction Listening Skills and Phonetics: Introduction to phonetics, sounds mispronounced, silent and non-silent letters, Homophones and homonyms, aspiration, pronunciation of "The" words ending with age. Use of articles – indefinite and definite articles.

(ii) Identifying Common Errors in writing and speaking English: Subject verb agreement (concord rules with exercises), common errors in subject verb agreement, noun-pronoun agreement. Adjective, adverb, verb, sequence of tenses, misplaced modifiers, Articles and prepositions, common errors in conjunctions. Gender, singular and plural.

**(4) Textile Fibres**

Classification of Polymers-Application of Polymers, study of Various methods of polymerization - Study of various types of initiators -Techniques of polymerization - Physical structure of polymers-Polymer reactions -Thermal analysis of polymers; Study of different structures of textile fibres using various techniques-Study of different properties of various textiles fibres i.e., moisture relations, mechanical properties optical properties, electrical properties and thermal properties; History on origin of textiles -Study of different textiles fibres-Basic requirements of textile fibres, Geographic distribution-Cultivation and grading of cotton, wool, silk and jute fibres - Physical and chemical properties of important natural fibres; Sequence of operations in conversion of important natural fibres into fabric; Study of different man-made fibre spinning,

Fundamentals of fluid flow in man - made fibre spinning-High speed melt spinning-Formation of fibre structure during various methods of man -made spinning-Production of micro denier and special shaped fibres; Production and Properties of various regenerated fibres - Production of various raw materials for different synthetic fibres - Properties of different synthetic fibres-Effect of various parameters on various synthetic fibres-Study of semi-continuous and integrated continuous process for production of Nylons; Study of different high performance fibres; Study of spin finish -heat setting and drawing of fibres; Study of different methods of texturing and various parameters affecting texturizing—test methods of textured yarns; Study of different yarn count systems-conversion from one system to another system.

### **(5) Yarn Manufacture: Ginning and Baling**

(i) Blow room: Objects and methods of mixing - Opening and cleaning- Blow room machineries cleaning efficiency - Lap regularity - Modern developments - Auto mixer and calculations pertaining to blow room.

(ii) Carding: Objects - Working - Speeds and Setting - Grinding and stripping - Silver quality- Modern developments in carding - Calculations related to warding - fibre hooks at card - Opening lines required for processing of various blends.

(iii) Drawing: Objects and Principles - Roller drafting systems - Modern developments Calculations pertaining to draw frame.

(iv) Combing: Hook formation in carding -Study of preparatory machines to comber Combing process-Setting - Modern - Combers - Calculations pertaining to comber.

(v) Speed Frame: Objects -working and drafting systems -Twist insertion -Mechanism of winding -Lift of bobbin-Bobbin building mechanism -Speeds and production calculations- Modern speed frames.

(vi) Ring Frame: Objects-Working and ring frame mechanisms-Yarns tension during spinning a yarn and package faults -modern developments- calculations pertaining to ring frame.

(vii) Doubling: Objects -Dry doubling and wet doubling - Fancy yarns Hosiery and sewing threads - Properties and end uses.

(viii) Open End Spinning: Principles of Break spinning-Comparison of ring and OE yarns - Recent developments in OE spinning -Different types of rotors and opening rollers.

### **(6) Modern Yarn Production Methods**

Twist less spinning, self-twist spinning, wrap spinning, friction spinning and air –jet spinning, comparison of the above methods for their principles and yarn properties, end used and techno-economics feasibility, Siro, core and cove spinning methods.

### **(7) Fabric Manufacture**

(i) Winding: Objects - Derivation of speeds- coil angles- Cone angle -Study of modern winders Production Calculations

(ii) Warping: Objects -Study of modern warping machines -Production calculations.

(iii) Sizing: Study of ingredients –Properties- Modern size cooking equipment- Modern sizing machine - Production calculations.

(iv) Looms: Study of Plain tappet tappet loom- Automatic looms - Drop box looms - Dobby and jacquard looms - Production calculations.

(v) Unconventional Weaving Machine: Study of Gripper - Rapier - Air jet- water jet machines.

(vi) Non Wovens: Classification, web productions techniques, properties of binders, geometry of non woven structures, identification and testing of non wovens, study of thermal, spun bonding and spun lacing.

(vii)Knitting: Weft basic stitches, Jersey, Rib, Purl, interlock, wrap basic stitches, pillar, atlas, tricot, study of circular weft knitting machines, advantages of positive feed, study of wrap knitting machines, tricot and Raschel.

### **(8)Chemical Processing Of Textiles**

(i) Pre-process: Preparatory processes to wet processing; An overview' of wet processing - Sequences of wet processing- Desizing-Methods of desizing - Singeing - Methods of singeing - Batching -Souring - Bleaching - Mercerizing; Methods of purifying fibre yarn and Fabric made from other natural fibre like silk, wool, jute etc., Methods of desizing - Scouring and Bleaching of regenerated cellulose fibre.

(ii)Dyeing: Coloration- Theories of coloration / dyeing - Factors that affect Dyeing Mechanism of dyeing -Mechanism used for dyeing -Classification of dyes- Dyeing of Natural fibres using direct, reactive, acid, metal complex, vat, sulphur, Ingrain dyes and other popular dyes using different methods - After treatments and testing of dyed materials Yarn package dyeing - Dyeing of knitted fabrics -Dyeing of garments.

(iii)Printing: Design development for printing - Sources of inspection- the designers tools and work space- Different techniques for design generation and reproduction- Transfer of designs on wooden blocks, Screen and Stencil- Scope of printing- Methods and principles of printing- Machineries used for Textile printing- Passage of material through printing machines.

(iv)Finishing: Objects of finishing Various methods of finishing - Cotton, Silk, Wool, worsted fabric- Chemicals formulation of different finishes - Machineries used for finishing - Speciality chemicals used for finishing - Finishing of Garments.

### **(9) Textile Testing**

(i)Fibres: Regain, length, fineness, maturity, strength, their determination, HVI AND AFIS.

(ii) Yarn: Yarn count, twist, strength, hairiness, uniformity and their determination.

(iii) Fabrics: Fabric weight, thickness, cover, tear, abrasion, drape, crease, colour, fastness, their determination. Fabric handle, KESF and FAST.

