

8. SCHEME OF EXAMINATION - OBJECTIVE TYPE (OMR METHOD):-

Subject	Duration	Maximum Marks	Minimum Qualifying Marks for selection	
			SCs, SC(A)s, STs, BC(OBCM)s, MBCs/DCs and BCMs	Others
<u>Paper - I (Subject Paper)</u> (200 Questions) <u>Diploma Standard</u> 1. Civil Engineering (Code No. 299) 2. Architectural Assistantship (Code No. 323) 3. Handloom Technology /Textile Technology/Textile Manufacture (Code No. 339)	3 hours	300	150	200
<u>Paper- II (General Studies)</u> (100 Questions) (Code No.003) General Studies (HSC Standard) – 75 Questions and Aptitude and Mental Ability Test (SSLC Standard) – 25 Questions	2 hours	200		
Total		500		

Paper-I :-

- Sl. No. 1 Eligible for the posts of Junior Draughting Officer in Highways Department, Junior Draughting Officer in Public Works Department and Junior Engineer in Fisheries Department.
- Sl. No. 2 Only eligible for the post of Junior Draughting Officer in Public Works Department.
- Sl. No. 3 Only eligible for the post of Junior Technical Assistant in Handlooms And Textiles Department.

Note:

- (i) The question in Subject Paper – I in Civil Engineering (Code 299)(Diploma Std) will be set both in English and Tamil. For all other subjects in Paper-I (Diploma Std) Code No.323,339) will be set in English Only. The Questions in Paper-II will be set both in Tamil and English.
- (ii) Refer [para 17 of 'Instructions to Applicants'](#) in regard to instructions to be followed while appearing for competitive examinations conducted by the Commission.
- (iii) The Syllabus for Examination is furnished in the [Annexure-II](#) of the Notification and also available in the Commission's website www.tnpsc.gov.in.

ANNEXURE – II
TAMIL NADU PUBLIC SERVICE COMMISSION
PAPER – I
CIVIL ENGINEERING (DIPLOMA STANDARD)
Objective Type

SUBJECT CODE: 299

UNIT - I: ENGINEERING MECHANICS

Direct Stresses and strains (Tensile and compressive) due to Axial forces – Deformation of elastic bar due to uni-axial force - Shear force and bending moment diagrams for statically determinate beams - Geometrical properties of sections - Stresses in beams due to bending – Stresses in shafts due to torsion – Pin jointed perfect frames with vertical loads on nodal points (method of joints only).

UNIT - II: MECHANICS OF STRUCTURE

Deflection of cantilever and simply supported beams – Shear force and bending moment diagrams for statically indeterminate structures (Propped cantilever, Fixed Beams, continuous beams, Non-sway Portal frames) using Mohr's theorems and moment distribution method. Euler's and Rankin's formula for columns – Stresses due to eccentric loads – combined stresses due to direct loads and bending moments in rectangular sections.

UNIT - III: CONSTRUCTION MATERIALS & CONSTRUCTION PRACTICE

Bricks, Tiles, Cement, Fine Aggregate, Coarse Aggregate, Timber, Ply wood, Steel, Glass, Plastics, PVC, UPVC, Paints, Mortars, Concrete – Different types, qualities, requirements, standard specifications, Admixtures for cement mortar and concrete. Different types of Foundations, Masonry, Floors, Roofs, Doors and Windows, Weathering Course, Damp proof course, Plastering, Painting, Colour Washing – Specifications for different works.

UNIT - IV: TRANSPORTATION ENGINEERING

Roads – Different types – methods of formation of water bound macadam, bituminous and concrete roads – Hill roads – Requirements – Camber, gradient, super elevation, carriage way, pavements, drainage system, sight distance etc., Traffic Engineering, Bridges – Classification of bridges – Site selection and alignment – Foundation, substructure and super-structure. Sub-grade soil – Soil mass as a three phase system – Grain size classification - Atterberg limits – IS Classification of soils–Compaction – Shear strength – Road Arboriculture – Express Highways – Rapid Transport System.

UNIT - V: HYDRAULICS

Measurement of pressure in liquids – Pressure distribution and total pressure on immersed surfaces – Types of flow (Laminar, turbulent, steady, unsteady, uniform, nonuniform) – Flow through pipes – Losses – Hydraulic gradient and total energy lines. Bernoulli's theorem – use of Orifice, Mouthpiece, Orifice meter and Venturimeters – Flow through channels – Bazin's and Manning's formula – Economical sections for open channels, Pumps – Reciprocating pumps – Centrifugal pumps – Characteristics – Discharge – Power and efficiency, Ground water – Types of well – Test for yield of wells.

UNIT - VI: SURVEYING

Types of Surveys – Chain surveying – Compass surveying – Levelling – Contour surveying – Theodolite surveying – Trigonometrical levelling – Tacheometry – Field work – Simple problems. Curves, Global Positioning System (GPS), Remote sensing – Photogrammetric Surveying and Hydrographic Surveying, Total Station and Geographical Information System (GIS).

UNIT - VII: ENVIRONMENTAL ENGINEERING AND POLLUTION CONTROL

Sources of water – Conveyance of water – Treatment of water – Quality of water – Tests on water – Distribution systems – Sewers – Collection and conveyance of sewage – Sewer Appurtenances – Drainage arrangements and Sanitary fittings in buildings – Treatment and disposal of sewage, Solid waste Management. Environmental pollution – Air – water – Soil – Noise - Pollution Control.

UNIT - VIII: ESTIMATING AND COSTING

Systems of taking out quantities – Trade and Group systems – Material requirement for different items of works – Preparation of data for works – Report writing – Valuation of buildings and properties – Fixation of rents – Approximate estimates – Detailed estimate and Abstract estimate for buildings, well, sump, septic tanks, compound wall, roads etc.

UNIT - IX: STRUCTURAL ENGINEERING

Reinforced cement concrete structure – Analysis and design of singly and Doubly reinforced rectangular and T-beam sections – Cantilever, simply supported, continuous beams – One way and two way slabs – Lintels and sunshades – Staircases – Rectangular and circular short columns – Isolated column footings. (All designs by Limit State Method only). Steel structures – simple beams – Tension and compression members – simple columns.

UNIT - X: CONSTRUCTION MANAGEMENT

Planning of a project – Factors to be considered – Project reports – Organization structure on construction departments – Construction planning – CPM and PERT networks – Contracts – Tenders and Tender documents – Bill- Supervision and Quality control – Safety measures in construction sites – Banking practice – Cash flow diagrams. Entrepreneurship, Ethics in Engineering, Use of computers – Information Management, Financial Management, Disaster Management – Types of Natural calamities – Causes for major disaster – Preparedness – Response and Recovery.

ARCHITECTURAL ASSISTANTSHIP
(DIPLOMA STANDARD)

SUBJECT CODE: 323

UNIT – I: ENGINEERING MECHANICS

Simple Stresses and Strain – Stress and Strain – Modulus of Elasticity / Elastic constants – Application of stress and strain in engineering field – Behaviour of ductile and brittle material – Loads – Shear Force and Bending Moment – Geometrical properties of sections – Centroid – Moment of Inertia – Stress in Beams and Shafts – Stresses in Beams due to bending – Stress in shafts due to torsion – Pin Jointed Frames - Analytical Method – Graphical Method.

UNIT – II: BUILDING MATERIALS & CONSTRUCTION

Properties, characteristics, strengths, manufacturing, components & applications of materials & methods of construction & detailing for the following:

Stone – Brick & Clay Products – Lime – Cement – Timber – Concrete – Ferrous and Non-Ferrous Metals – Glass – Plastics – Asphalt, Sealants & Adhesives – Protective and Decorative Coatings – Water Proofing and Damps Proofing Materials – Rural Building Materials(Bamboo, Soil, etc.).

UNIT – III: HISTORY & THEORY OF ARCHITECTURE

History of Architecture

Egyptian Architecture – Greek Architecture – Roman Architecture – Early Christian & Byzantine Architecture – Gothic Architecture – Renaissance Architecture. Indian Architecture – Indus Valley Civilization, Buddhist Architecture, Hindu Architecture – Islamic Architecture in India. Modern Architecture, Post Modernism, Deconstructivism Contemporary World Architecture.

Theory of Architecture

Definition of Architecture – Architecture as satisfying functional, aesthetic & psychological human needs. Elements of Architecture – Form, Space, Light, colour, etc. Principles of Architecture – Proportion, Balance, Scale, Symmetry, etc.

UNIT – IV: STRUCTURAL ENGINEERING

Slope and Deflection of Beams – Propped Cantilevers – Fixed Beams – Arches – Continuous Beams – Theorem of Three Moments – Continuous Beams – Moment Distribution Method – Columns and Struts – Combined Bending and Direct Stresses – Earth Pressure and Retaining Walls – Working Stress Method Design of Beams for Flexure by L.S.M – Design of T-Beams and Continuous Beams by L.S.M – Design of Beams for Shear by L.S.M – Design of Oneway Slabs by L.S.M - Design of Twoway Slabs by L.S.M - Design of Staircases by L.S.M - Design of Columns by L.S.M - Design of Column Footings – Design of Simple Beams – Design of Tension Members – Design of Compression Members – Design of Welded Connections.

UNIT – V: ENVIRONMENTAL ENGINEERING

Sources of Water – Collections and Conveyance of Water – Quality of Water – Treatment of Water – Distribution System – Appurtenances and Maintenance of Water Lines – Collections and Conveyance of Sewage – Treatments and Disposal – Environmental Pollution and Control – Industrial Waste Water Treatment and Solid Waste Disposal – Land, Water & Air Pollution.

UNIT – VI: BUILDING SERVICES

Water Supply & Sewage Disposal, Mechanical Systems – Pumps & Motors, Electrical Systems – Generation & Distribution, Ventilation & Lighting, Air Conditioning – Principles, systems & applications, Vertical Transportation systems, Fire Hazards, Safety & Design Regulations, Acoustics.

UNIT – VII: SITE SURVEY & PLANNING

Chain Surveying – Compass Surveying – Plane Table Surveying – Levelling – Theodolite – Contouring – Minor Instruments.

Site Drawings – Site marking, Importance & procedures for making site drawings & dimensioning.

UNIT – VIII: SPECIFICATION & ESTIMATION

Stages of Detailed Estimate – Measurements & Material Requirement – Specification & Report Writing – Approximate Estimates – Areas and Volumes – Data – Valuation – Detailed Estimate.

UNIT – IX: TOWN PLANNING

Town Planning Principles – Road and Street Planning – Housing – Economy, Society, Environment and Transport Policy and Planning – Town Planning Rules, Building Bye-Laws & Development Control Rules.

UNIT – X: COMPUTER AIDED DRAFTING & VISUALIZATION

2D & 3D Drafting & Visualization - Using AutoCAD, etc– Setting limits and creating entities like LINE, ARC, CIRCLE etc – Editing the drawing with edit commands like TRIM, FILLET, COPY, MOVE etc., Creating 2D building working drawings.

Visualization using SKETCH UP, 3DMAX, etc.

HANDLOOM TECHNOLOGY / TEXTILE TECHNOLOGY/
TEXTILE MANUFACTURE (DIPLOMA STANDARD)
SUBJECT CODE: 339

UNIT- I: FIBRE PROPERTIES AND MAN-MADE FIBRE SPINNING

- i) Properties of textile fibres
- ii) Classification of Textile fibres – vegetable, animal, mineral, regenerated, synthetic
- iii) Microscopic, physical and chemical test methods for fibre identification
- iv) Physical & Chemical properties of Vegetable fibres – Cotton, Jute, linen
- v) Physical & Chemical properties of Animal fibres – Wool, Silk
- vi) Physical & Chemical properties of Regenerated Cellulosic fibres – Viscose and Acetate Rayon, Cuprammonium Rayon
- vii) Physical & Chemical properties of Synthetic fibres – Polyester, Nylon
- viii) Requirements of fibre forming polymers
- ix) Spinning of Polymers - Melt Spinning, Wet spinning, Dryspinning
- x) Post Spinning Operations – Drawing, Crimping, Heat setting, Texturisation and spin finish application

UNIT- II: SPUN YARN FORMATION

- i) Ginning – Principle, machines and gin out-turn.
- ii) Objectives / Principles of opening, cleaning and mixing/blending machines
- iii) Working mechanisms of blowroom, card, drawframe, comber, comber preparatory, speedframe, ringframe, doubling machinery.
- iv) Salient features of blowroom, card, drawframe, comber, comber preparatory, speedframe, ringframe, doubling machinery.
- v) Working principles and features of open end spinning machines – rotor, air jet and air vortex
- vi) Norms and Critical settings related to quality / production in spinning machinery.
- vii) Yarn conditioning, reeling, bundling and baling
- viii) Maintenance of spinning machines

UNIT- III: TEXTILE CALCULATIONS

- i) Calculations of speed, draft, hank, production and efficiency in spinning machines.
- ii) Production and efficiency calculations in Winding, Warping, Sizing and Weaving
- iii) Indirect count systems –English, French, Worsted, linen and metric
- iv) Direct count systems – Tex and Denier.
- v) Conversion of yarn count from one system to other -Within Indirect, within Direct systems
- vi) Conversion of yarn count from indirect to direct systems and vice versa
- vii) Resultant count of folded yarn, Average count, Yarn Costing
- viii) Reed and heald calculations; Fabric cover, Fabric Costing.

UNIT- IV: FABRIC FORMATION

- i) Objectives of preparatory processes
- ii) Preparatory processes for handloom industry
- iii) Warp winding - random and precision winding, winding drum parameters
- iv) Stop motions, yarn clearers, tensioners and knotters/splicers

- v) Warping –Types of warping, Creels, Length measurement, stop motion
- vi) Working principles of Pirn winders
- vii) Sizing –Ingredients, Size recipes for cotton, silk and blends of cotton with polyester and viscose.
- viii) Principles of Drawing-in and Denting.
- ix) Primary, Secondary and Tertiary motions of loom, Loomtiming diagram.
- x) Tappet, Dobby and Jacquardshedding, Handloom shedding motion, Drop Box mechanism.
- xi) Features of Pit loom, raised pit loom, frame loom, semi-automatic loom and improved handlooms.
- xii) Principles of Shuttleless Weft insertionsystems.
- xiii) Maintenance of shuttle and shuttleless looms
- xiv) Fabric defects – causes and remedies

UNIT- V: FABRIC STRUCTURE

- i) Elements of woven fabric design – weave, draft and peg plan
- ii) Construction of Weaves - Plain weave and its derivatives, Regular and Modified Twills, Sateen and Satin, Crepe, Honey comb, Brighton honey comb, Mock-leno, Huck-a-back, Bedford cords, Welt, pique, backed cloth, Double Cloth, Triple Cloth, Tubular cloth, damask, tapestry, patent satin.
- iii) Extra warp and Extra weft figuring
- iv) Terry Pile – 3 pick, 4 pick, 5 pick and 6 pick terry weaves.
- v) Cut Pile – Velvets and Velveteens.
- vi) Gauze and Leno structures
- vii) Colour and Weave Effect
- viii) Computer Aided Textile Designing (CATD) – Photoshop, Coreldraw, Paintshop Pro and CATD softwares

UNIT - VI: CHEMICAL PROCESSING

- i) Preparatory processes – Desizing, Scouring and Bleaching – Objectives, Machines and Methods
- ii) Mercerisation – Objectives, Machines and Methods
- iii) Dyeing techniques for cotton, silk and blends– Direct, Reactive, Vat, Acid, Basic and Disperse dyes.
- iv) Batchwise and Continuous dyeing. Dyeing machines.
- v) Styles of printing – Direct, Resist, Discharge.
- vi) Printing techniques – Roller, Rotary Screen, Flat bed.
- vii) Mechanical and chemical finishing – calendaring, anti-shrink, resin finish, water repellent finish, flame retardant finish.

UNIT - VII: KNITTING, GARMENTS & MODERN DEVELOPMENTS IN HANDLOOMS

- i) Knitting - Yarn quality requirements, principles of weft and warp knitting
- ii) Basic weft and warp knitted structures and its properties – plain, rib, interlock and purl.
- iii) Garments - Pattern making, Spreading, Cutting, Sewing
- iv) Developments in Handlooms – Solid border weaving, multiple putta weaving, pneumatic / electrical lifting devices for jacquard, electronic jacquard for handlooms.

UNIT - VIII: TESTING & QUALITY CONTROL

- i) Important terms in Textile quality control – Mean, Median, Mode, SD, SE and CV.
- ii) Calculations related to test of significance.
- iii) Control charts and their applications in textile quality control.
- iv) Sampling techniques – objectives and types of sampling
- v) Humidity control – Standard and Testing atmosphere, Measurement of Relative Humidity.
- vi) Measurement of fibre length, strength, fineness, maturity and trash
- vii) Determination of yarn count, twist – Twist per unit length, twist multiplier; strength - CSP, RKM; elongation, hairiness, Evenness
- viii) Determination of fabric strength, stiffness, handle, drape, thickness, GSM, crease resistance, abrasion resistance, pilling resistance, air / water permeability, dimensional stability.
- ix) Determination of fastness to washing, rubbing, light.
- x) Inspection and Merchandising.

UNIT- IX: NONWOVENS, TECHNICAL TEXTILES & HANDLOOM FABRICS

- i) Classification of Nonwovens - Mechanical, Thermal and Chemical bonded fabrics
- ii) Technical Textiles- Belts, Tyre-cords, Coated abrasives, Airbags, Flame Resistant fabrics, Ballistic protective fabrics, Geotextiles, Medical Textiles.
- iii) Quality Particulars of handloom fabrics – Sarees, dhotis, angavastrams, bedsheets, towels, lungies, fabrics reserved for exclusive production on handlooms.
- iv) Traditional handloom Saris – Banaras, Kanchipuram, Jamdhani, Paithani, Chanderi, Patola, Sungudi, Ikats of Andhrapradesh and Orissa.

UNIT- X: TEXTILE MILL MANAGEMENT

- i) Plant location, lay out, material handling in textile mills
- ii) Selection and balancing of preparatory machines and looms
- iii) Costing – Elements, Balance sheet, Profit & Loss Account
- iv) Production, Planning & Control.
- v) Total Quality Management, Management Information System.
- vi) Human Resources management – Selection, recruitment, training, Industrial relations and Labour laws
- vii) Role of BIS, AEPC, HEPC, IIHT, WSC, Textile Committee, Textile Commissioner Office.
- viii) New Textile Policy.
- ix) Pollution Control: Types - Air, Water, Noise; Characteristics of Effluent and Effluent treatment of Wet Processing industry
- x) Energy audit and conservation.

PAPER-II
GENERAL STUDIES (H.S.C STANDARD)
OBJECTIVE TYPE

SUBJECT CODE: 003

UNIT-I GENERAL SCIENCE:

Physics: Nature of Universe-General Scientific laws-Inventions and discoveries-National scientific laboratories-Mechanics and properties of matter-Physical quantities, standards and units-Force, motion and energy-Magnetism, electricity and electronics -Heat, light and sound.

Chemistry-Elements and Compounds-Acids, bases and salts-Fertilizers, pesticides, insecticides.

Botany-Main Concepts of life science-Classification of living organism-Nutrition and dietetics-Respiration.

Zoology-Blood and blood circulation-Reproductive system-Environment, ecology, health and hygiene-Human diseases including communicable and non – communicable diseases - prevention and remedies-Animals, plants and human life.

UNIT-II. CURRENT EVENTS

History-Latest diary of events-national - National symbols - Profile of States-Eminent persons & places in news-Sports & games-Books & authors - Awards & honors'-India and its neighbours

Political Science-1. Problems in conduct of public elections-2. Political parties and political system in India-3. Public awareness & General administration-4. Welfare oriented govt. schemes, their utility

Geography--Geographical landmarks-

Economics-- Current socio-economic problems

Science-Latest inventions on science & technology

UNIT- III. GEOGRAPHY

Earth and Universe-Solar system-Monsoon, rainfall, weather & climate-Water resources --- rivers in India-Soil, minerals & natural resources-Forest & wildlife-Agricultural pattern-Transport including surface transport & communication-Social geography – population-density and distribution-Natural calamities – Disaster Management.

UNIT - IV. HISTORY AND CULTURE OF INDIA AND TAMIL NADU

Indus valley civilization-Guptas, Delhi Sultans, Mughals and Marathas-Age of Vijayanagaram and the bahmanis-South Indian history-Culture and Heritage of Tamil people-India since independence-Characteristics of Indian culture-Unity in diversity –race, colour, language, custom-India-as secular state-Growth of rationalist, Dravidian movement in TN-Political parties and populist schemes.

UNIT-V. INDIAN POLITY

Constitution of India--Preamble to the constitution- Salient features of constitution- Union, state and territory- Citizenship-rights amend duties- Fundamental rights- Fundamental duties- Human rights charter- Union legislature – Parliament- State executive- State Legislature – assembly- Local government – panchayat raj – Tamil Nadu- Judiciary in India – Rule of law/Due process of law—

Elections- Official language and Schedule-VIII- Corruption in public life- Anti-corruption measures – CVC, Lok-adalats, Ombudsman, CAG - Right to information- Empowerment of women- Consumer protection forms.

UNIT-VI. INDIAN ECONOMY

Nature of Indian economy- Five-year plan models-an assessment-Land reforms & agriculture- Application of science in agriculture-Industrial growth-Rural welfare oriented programmers-Social sector problems – population, education, health, employment, poverty-Economic trends in Tamil Nadu

UNIT-VII. INDIAN NATIONAL MOVEMENT

National renaissance-Emergence of national leaders-Gandhi, Nehru, Tagore-Different modes of agitations-Role of Tamil Nadu in freedom struggle Rajaji, VOC, Periyar, Bharathiar & others.

UNIT-VIII. APTITUDE & MENTAL ABILITY TEST (SSLC STANDARD)

Conversion of information to data - Collection, compilation and presentation of data - Tables, graphs, diagrams - Analytical interpretation of data - Simplification-Percentage - Highest Common Factor (HCF) - Lowest Common Multiple (LCM) - Ratio and Proportion - Simple interest - Compound interest – Area – Volume -Time and Work - Logical Reasoning - Puzzles – Dice -Visual Reasoning - Alpha numeric Reasoning - Number Series.
