

TSSPDCL Syllabus 2022 (Assistant Engineer)

TSSPDCL Exam Pattern 2022

Name of the Subject	Number of Questions	Number of Marks
Section A: Subject (Engineering Mathematics and Electrical Engineering)	80	80
Section B: General Knowledge and Numerical Ability	20	20
Total	100 Questions	100 Marks
Time Duration of Exam: 2 Hours		
Type of Examination: Multiple Choice Questions		

TSSPDCL Syllabus 2022 - (Subject Wise)

Engineering Mathematics

- **Linear Algebra:** Matrix Algebra, Systems of linear equations, Eigenvalues, Eigenvectors.
- **Calculus:** Mean value theorems, Theorems of integral calculus, Evaluation of definite and improper integrals, Partial Derivatives, Maxima and minima, Multiple integrals, Fourier series, Vector identities, Directional derivatives, Line integral, Surface integral, Volume integral, Stokes's theorem, Gauss's theorem, Green's theorem.
- **Differential equations:** First order equations (linear and nonlinear), Higher order linear differential equations with constant coefficients, Method of variation of parameters, Cauchy's equation, Euler's equation, Initial, and boundary value problems, Partial Differential Equations, Method of separation of variables.
- **Complex variables:** Analytic functions, Cauchy's integral theorem, Cauchy's integral formula, Taylor series, Laurent series, Residue theorem, Solution integrals.
- **Probability and Statistics:** Sampling theorems, Conditional probability, Mean, Median, Mode, Standard Deviation, Random variables, Discrete and Continuous distributions, Poisson distribution, Normal distribution, Binomial distribution, Correlation analysis, Regression analysis.
- **Numerical Methods:** Solutions of nonlinear algebraic equations, Single and Multi-step methods for differential equations.
- **Transform Theory:** Fourier Transform, Laplace Transform, z-Transform.

Electrical Engineering

- **Electric Circuits:** Network graph, KCL, KVL, Node, and Mesh analysis, Transient response of dc and ac networks, Sinusoidal steady-state analysis, Resonance, Passive filters, Ideal current and voltage sources, Thevenin's theorem, Norton's theorem, Superposition theorem, Maximum power transfer theorem, Two-port networks, Three-phase circuits, Power and power factor in ac circuits.
- **Electromagnetic Fields:** Coulomb's Law, Electric Field Intensity, Electric Flux Density, Gauss's Law, Divergence, Electric field and potential due to point, line, plane, and spherical charge distributions, Effect of the dielectric medium, Capacitance of simple configurations, Biot-Savart's law, Ampere's law, Curl, Faraday's law, Lorentz force, Inductance, Magnetomotive force, Reluctance, Magnetic circuits, Self and Mutual inductance of simple configurations.
- **Signals and Systems:** Representation of continuous and discrete-time signals, Shifting and scaling operations, Linear Time-Invariant and Causal systems, Fourier series representation of continuous periodic signals, Sampling theorem, Applications of Fourier Transform, Laplace Transform, and z-Transform.
- **Electrical Machines:** Single phase transformer: equivalent circuit, phasor diagram, open circuit, and short circuit tests, regulation and efficiency; Three-phase transformers: connections, parallel operation; Auto-transformer, Electromechanical energy conversion principles,
- **DC machines:** separately excited, series and shunt, motoring and generating mode of operation and their characteristics, starting and speed control of dc motors; Three-phase induction motors: the principle of operation, types, performance, torque-speed characteristics, no-load and blocked rotor tests, equivalent circuit, starting and speed control; Operating principle of single-phase induction motors;
- **Synchronous machines:** cylindrical and salient pole machines, performance, regulation and parallel operation of generators, starting of synchronous motor, characteristics; Types of losses and efficiency calculations of electric machines. Power Systems Power generation concepts, ac, and dc transmission concepts, Models and performance of transmission lines and cables, Series and shunt compensation, Electric field distribution and insulators, Distribution systems, Per-unit quantities, Bus admittance matrix, Gauss-Seidel, and Newton-Raphson load flow methods, Voltage and Frequency Control, Power factor correction, Symmetrical components, Symmetrical and unsymmetrical fault analysis, Principles of overcurrent, differential and distance protection; Circuit breakers, System stability concepts, Equal area criterion.
- **Control Systems:** Mathematical modeling and representation of systems, Feedback principle, transfer function, Block diagrams, and signal flow graphs, Transient and Steady-state analysis of linear time-invariant systems, Routh-Hurwitz and Nyquist criteria, Bode plots, root loci, Stability analysis, Lag, Lead and Lead-Lag compensators; P, PI and PID controllers; State-space model, State transition matrix.
- **Electrical and Electronic Measurements:** Bridges and Potentiometers, Measurement of voltage, current, power, energy, and power factor; Instrument transformers, Digital voltmeters and multimeters, Phase, Time, and Frequency measurement; Oscilloscopes, Error analysis.

- **Analog and Digital Electronics:** Characteristics of diodes, BJT, MOSFET; Simple diode circuits: clipping, clamping, rectifiers; Amplifiers: Biasing, Equivalent circuit, and Frequency response; Oscillators and Feedback amplifiers; Operational amplifiers: Characteristics and applications; Simple active filters, VCOs and Timers, Combinational and Sequential logic circuits, Multiplexer, Demultiplexer, Schmitt trigger, Sample and hold circuits, A/D and D/A converters, 8085 Microprocessor: Architecture, Programming, and Interfacing.
- **Power Electronics:** Characteristics of semiconductor power devices: Diode, Thyristor, Triac, GTO, MOSFET, IGBT; DC to DC conversion: Buck, Boost, and Buck-Boost converters; Single and three-phase configuration of uncontrolled rectifiers, Line commutated thyristor-based converters, Bidirectional ac to dc voltage source converters, Issues of line current harmonics, Power factor, Distortion factor of ac to dc converters, Single phase and three-phase inverters, Sinusoidal pulse width modulation

General Awareness and Numerical Ability

- Analytical & Numerical Ability
- General Awareness
- English
- Related to Telangana Culture & Movement and
- Computer Knowledge