UPPCL JE Syllabus 2024

UP Power Corporation Limited conducts a recruitment campaign for Junior Engineers. The recruitment process is often divided into two phases: written test and document verification. The same can be expected during the 2024 examination cycle. Aspirants preparing for the UPPCL JE Recruitment process should thoroughly review the UPPCL JE Syllabus 2024. The exam consists of four sections: technical knowledge, general awareness, logical reasoning, and general Hindi. Going through the UPPCL JE Syllabus 2024 will help you determine the topics that are vital for the exam and demand more time to prepare than others. Examine the UPPCL JE Syllabus 2024 carefully.

UPPCL JE Syllabus for Electrical Engineering

Subject	**Topic**
Digital Electronics	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
Electrical Machines	Single-phase transformer: equivalent circuit, phasor diagram, open circuit, and short circuit tests, regulation, and efficiency

	Three-phase transformers: connections, vector groups, parallel operation
	Auto-transformer
	Electromechanical energy conversion principles
	DC machines: separately excited, series and shunt, motoring and generating, mode of operation and their characteristics, speed control of DC motors
	Three-phase induction machines: 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 and characteristics, regulation and parallel operation of generators, starting of synchronous motors
	Types of losses and efficiency calculations of electric machines
Digital Signal Processing	-

Measurements, Instrumentation, and Transducers	-
Analytical Instrumentation	-
Power Electronics	Static V-I characteristics and firing/gating circuits for Thyristor, MOSFET, IGBT
	DC to DC conversion: Buck, Boost and Buck-Boost Converters
	Single and three-phase configuration of uncontrolled rectifiers
	Voltage and Current commutated Thyristor based converters
	Bidirectional AC to DC voltage source converters
	Magnitude and Phase of line current harmonics for uncontrolled and thyristor based converters
	Power factor and Distortion Factor of AC to DC converters
	Single-phase and three-phase voltage and current source inverters, sinusoidal pulse width modulation

Electrical Circuits and Fields	Network elements: ideal voltage and current sources, dependent sources, R, L, C, M elements
	Network solution methods: KCL, KVL, Node, and Mesh analysis
	Network Theorems: Thevenin's, Norton's, Superposition and Maximum Power Transfer theorem
	Transient response of DC and AC networks, sinusoidal steady-state analysis, resonance, two-port networks, balanced three-phase circuits, star-delta transformation, complex power and power factor in AC circuits
	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 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

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
	Stability analysis using Routh-Hurwitz and Nyquist criteria
	Bode plots
	Root loci
	Lag, Lead and Lead-Lag compensators
	P, PI and PID controllers
	State space model, Solution of state equations of LTI systems
Industrial Instrumentation	-
Computer Control of Processes, Networks	-

Communication Engineering	-
Power Electronics and Drives	-
Power Systems	Basic concepts of electrical power generation
	AC and DC transmission concepts
	Models and performance of transmission lines and cables
	Economic Load Dispatch (with and without considering transmission losses)
	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 over-current, differential, directional and distance protection
	Circuit breakers
	System stability concepts
	Equal area criterion

UPPCL JE Syllabus for Civil Engineering

Subject	**Topic**
Building Materials	Physical and Chemical properties, classification, standard tests, uses and manufacture/quarrying of materials (e.g., building stones, silicate-based materials, cement (Portland), asbestos products, timber and wood-based products, laminates, bituminous materials, paints, varnishes).
Estimating, Costing and Valuation	Estimate, glossary of technical terms, analysis of rates, methods and unit of measurement, items of work – earthwork, brick work (Modular & Traditional bricks), RCC work, shuttering, timber work, painting, flooring, plastering. Boundary wall, brick building, water tank, septic tank, bar bending schedule, center line method, midsection formula, trapezoidal formula, Simpson's rule. Cost estimate of septic tank,

	flexible pavements, tube well, isolated and combined footings, steel truss, piles and pile-caps. Valuation – value and cost, scrap value, salvage value, assessed value, sinking fund, depreciation and obsolescence, methods of valuation.
Surveying	Principles of surveying, measurement of distance, chain surveying, working of prismatic compass, compass traversing, bearings, local attraction, plane table surveying, theodolite traversing, adjustment of theodolite, leveling, definition of terms used in leveling, contouring, curvature and refraction corrections, temporary and permanent adjustments of dumpy level, methods of contouring, uses of contour map, tachometric survey, curve setting, earth work calculation, advanced surveying equipment.
Soil Mechanics	Origin of soil, phase diagram, definitions-void ratio, porosity, degree of saturation, water content, specific gravity of soil grains, unit weights, density index and interrelationship of different parameters, grain size distribution curves, and their uses. Index properties of soils, Atterberg's limits, ISI soil classification, and plasticity chart. Permeability of soil, coefficient of permeability, determination of coefficient of permeability, unconfined and confined aquifers, effective stress, quick sand, consolidation of soils, principles of consolidation, degree of consolidation, preconsolidation pressure,

	normally consolidated soil, e-log p curve, computation of ultimate settlement. Shear strength of soils, direct shear test, vane shear test, triaxial test. Soil compaction, laboratory compaction test, maximum dry density and optimum moisture content, earth pressure theories, active and passive earth pressures, bearing capacity of soils, plate load test, standard penetration test.
Hydraulics	Fluid properties, hydrostatics, measurements of flow, Bernoulli's theorem and its application, flow through pipes, flow in open channels, weirs, flumes, spillways, pumps and turbines.
Irrigation Engineering	Definition, necessity, benefits, effects of irrigation, types and methods of irrigation, hydrology – measurement of rainfall, runoff coefficient, rain gauge, losses from precipitation – evaporation, infiltration, etc. Water requirement of crops, duty, delta and base period, Kharif and Rabi crops, command area, time factor, crop ratio, overlap allowance, irrigation efficiencies. Different types of canals, types of canal irrigation, loss of water in canals.
Canal Lining	Types and advantages. Shallow and deep wells, yield from a well. Weir and barrage, failure of weirs and permeable foundation, slit and scour, Kennedy's theory of critical velocity, Lacey's theory of uniform flow. Definition of flood, causes and effects, methods of flood control,

	water logging, preventive measures. Land reclamation, characteristics affecting fertility of soils, purposes, methods, description of land and reclamation processes. Major irrigation projects in India.
Transportation Engineering	Highway Engineering – cross sectional elements, geometric design, types of pavements, pavement materials – aggregates and bitumen, different tests, design of flexible and rigid pavements – Water Bound Macadam (WBM) and Wet Mix Macadam (WMM), gravel road, bituminous construction, rigid pavement joint, pavement maintenance, highway drainage. Railway Engineering – components of permanent way – sleepers, ballast, fixtures, and fastening, track geometry, points and crossings, track junction, stations and yards. Traffic Engineering – different traffic surveys, speed-flow-density, and their interrelationships, intersections, and interchanges, traffic signals, traffic operation, traffic signs and markings, and road safety.
Environmental Engineering	Quality of water, source of water supply, purification of water, distribution of water, need of sanitation, sewerage systems, circular sewer, oval sewer, sewer appurtenances, sewage treatments. Surface water drainage. Solid waste management – types, effects, engineered management system. Air pollution – pollutants, causes, effects, control. Noise pollution – cause, health effects, control.

Structural Engineering	Theory of structures: Elasticity constants, types of beams – determinate and indeterminate, bending moment and shear force diagrams of simply supported, cantilever, and overhanging beams. Moment of area and moment of inertia for rectangular & circular sections, bending moment and shear stress for tee, channel, and compound sections, chimneys, dams and retaining walls, eccentric loads, slope deflection of simply supported and cantilever beams, critical load and columns, torsion of circular section.
Concrete Technology	Properties, advantages, and uses of concrete, cement aggregates, importance of water quality, water cement ratio, workability, mix design, storage, batching, mixing, placement, compaction, finishing and curing of concrete, quality control of concrete, hot weather and cold weather concreting, repair and maintenance of concrete structures.
RCC Design	RCC beams – flexural strength, shear strength, bond strength, design of singly reinforced and doubly reinforced beams, cantilever beams. T-beams, lintels. One way and two way slabs, isolated footings. Reinforced brick works, columns, staircases, retaining wall, water tanks (RCC design questions may be based on both Limit State and Working Stress methods).

Steel Design	Steel design and construction of steel columns, beams, roof trusses, plate girders.

UPPCL JE Syllabus for General Awareness/ Knowledge

Topics for General Awareness/ Knowledge covered in UPPCL JE Syllabus	
Indian History	Events related to India and its neighboring countries
Indian Constitution	General Polity
Indian Economy	Indian Culture & Heritage
Current Affairs – International & National	Science & Technology
Indian & World Geography	

UPPCL JE Syllabus for Reasoning

Topics for Reasoning covered in UPPCL JE Syllabus	
Series Completion	Statement – Conclusions
Alpha-Numeric Sequence Puzzle	Direction Sense Test
Number, Ranking & Time Sequence	Logical Venn Diagrams
Clocks & Calendars	Deriving Conclusions from Passages

Situation Reaction Test	Alphabet Test
Statement – Arguments	Eligibility Test
Classification	Data Sufficiency
Coding-Decoding	Theme Detection
Arithmetical Reasoning	Logic
Mathematical Operations	Analogy
Inserting The Missing Character	Puzzle Test
Logical Sequence of Words	

UPPCL JE Syllabus for General Hindi

Topics for General Hindi covered in UPPCL JE Syllabus	
Phrases	Plural Forms
Translation of Sentences	Comprehension
Fill in the Blanks	Synonyms
Grammar	Antonyms
Vocabulary	Error Detection