SSC JE Syllabus 2019 Paper 2

The Junior Engineer Paper 2 is divided into 3 varied parts. Part A will be of Civil & Structural Eng whereas Part B is Electrical Eng and Part C is Mechanical Eng.

SSC JE Part A - Civil & Structural Engineering Syllabus

Units	Topics
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, Centre line method, Mid-section formula, Trapezodial formula, Simpson‟s rule etc.
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, Levelling, Definition of terms used in levelling, contouring, curvature and refraction corrections, temporary and permanent adjustments of dumpy level, methods of contouring, uses of contour map etc.
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 etc.
Irrigation Engineering	Definition, necessity, benefits, 2II effects of irrigation, types and methods of irrigation, Hydrology – Measurement of rainfall, run off coefficient, rain gauge, losses from precipitation etc.
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) etc.
Environmental Engineering	Quality of water, source of water supply, purification of distribution of water, need of sanitation, sewerage systems, circular sewer, oval sewer, appurtenances, sewage treatments etc.
Structural Engineering	
Theory of structures	Elasticity constants, types of beams – determinate and indeterminate, bending moment and shear force diagrams of simply supported, cantilever and over hanging beams. Moment of area and

	moment of inertia for rectangular & circular sections etc.
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 etc.
RCC Design	RCC beams-flexural strength, shear strength, bond strength, design of singly reinforced and double reinforced beams, cantilever beams. T-beams, lintels. One way and two way slabs, isolated footings. Reinforced brick works, columns, staircases, retaining wall etc.
Steel Design	Steel design and construction of steel columns, beams roof trusses plate girders.

SSC JE Part B - Electrical Engineering Syllabus

Units	Topics
Basic concepts	Concepts of resistance, inductance, capacitance, and various factors affecting them. Concepts of current, voltage, power, energy and their units.
Circuit law	Kirchhoff‟s law, Simple Circuit solution using network theorems.
Magnetic Circuit	Concepts of flux, mmf, reluctance, Different kinds of magnetic materials, Magnetic calculations for conductors of different configuration e.g. straight, circular, solenoidal, etc. Electromagnetic induction, self and mutual induction.
AC Fundamentals	Instantaneous, peak, R.M.S. and average values of alternating waves, Representation of sinusoidal wave form, simple series and parallel AC Circuits consisting of R.L. and C, Resonance, Tank Circuit etc
Measurement and measuring instruments	Measurement of power (1 phase and 3 phase, both active and re-active) and energy, 2 wattmeter method of 3 phase power measurement. Measurement of frequency and phase angle.
Electrical Machines	D.C. Machine – Construction, Basic Principles of D.C. motors and generators, their characteristics, speed control and starting of D.C. Motors. Method of braking motor, Losses and efficiency of D.C. Machines etc.
Synchronous Machines	Generation of 3-phase e.m.f. armature reaction, voltage regulation, parallel operation of two alternators, synchronizing, control of active and reactive power. Starting and applications of synchronous motors etc.
Generation, Transmission and Distribution	Different types of power stations, Load factor, diversity factor, demand factor, cost of generation, inter-connection of power stations. Power factor improvement, various types of tariffs, types of faults, short circuit current for symmetrical faults. Switchgears – rating of circuit breakers etc.
Estimation and costing	Estimation of lighting scheme, electric installation of machines and relevant IE rules. Earthing practices and IE Rules.
Utilization of	Illumination, Electric heating, Electric welding,

Electrical Energy	Electroplating, Electric drives and motors.
Basic Electronics	Working of various electronic devices e.g. P N Junction diodes, Transistors (NPN and PNP type), BJT and JFET. Simple circuits using these devices.

SSC JE Part B - Mechanical Engineering Syllabus

Units	Topics
Theory of Machines and Machine Design	Concept of simple machine, Four bar linkage and link motion, Flywheels and fluctuation of energy, Power transmission by belts – V-belts and Flat belts, Clutches – Plate and Conical clutch, Gears –Type of gears etc.
Engineering Mechanics and Strength of Materials	Equilibrium of Forces, Law of motion, Friction, Concepts of stress and strain, Elastic limit and elastic constants, Bending moments and shear force diagram, Stress in composite bars etc.
Thermal Engineering	Properties of Pure Substances, 1 st Law of Thermodynamics, 2 nd Law of Thermodynamics, Air standard Cycles for IC engines, Rankine cycle of steam, Boilers; Classification; Specification etc.
Fluid Mechanics & Machinery	Properties & Classification of Fluid, Fluid Statics, Measurement of Fluid Pressure,Fluid Kinematics, Measurement of Flow rate Basic Principles etc.
Production Engineering	Classification of Steels : mild steal & alloy steel, Heat treatment of steel, Welding – Arc Welding, Gas Welding, Resistance Welding, Special Welding Techniques i.e. TIG, MIG, etc. (Brazing & Soldering), Welding Defects & Testing; NDT, Foundry & Casting – methods, defects, different casting processes etc.