

Delhi Development Authority DDA Recruitment 2016 Junior Engineer Electrical / Mechanical Syllabus

Junior Engineer (Electrical/Mechanical)

General Engineering (Electrical and Mechanical)

- **Electrical Engineering**

Basic Electrical Engg.: Elect. Measurements, Concepts of current, voltage, resistance, power and energy, their units, Ohm's law.

Circuit Law: Kirchooff's law, solution of simple network problems, Network theorems and their applications, Electro-magnetism, concept of flux, e m f, reluctance, magnetic circuits. Electro-magnetic induction, self and mutual inductance. A.C. fundamentals, instantaneous, peak, R.M.S. and average values of alternating waves, Equation of sinusoidal wave form, simple series and parallel AC. circuits consisting of R.L. and C, Resonance. Measurement and measuring instruments, Moving coil and moving iron ammeters and voltmeters, Extension of range, Wattmeters, Multimeters, megger, Basic Electronics.

Electrical machines: Basic principles of D.C. motors, generators, their characteristics, Speed control and starting of D.C. motors, losses and efficiency of D.C. machines. 1-Phase and 3-phase transformers: Principles of operation, equivalent circuit, voltage regulation, O.C. and S.C. tests, efficiency, auto transformers. Synchronous machines, generation of 3-phase e m f, armature reaction, Voltage regulation, parallel operation of two alternators, synchronizing, starting and applications of synchronous motors. 3-Phase Induction motor, rotating magnetic field, principle of operation, equivalent circuit, torque-speed characteristics, starting and speed control of 3-phase induction motors, Fractional KW motors, 1-phase induction motors, A.C. series motor, reluctance motor.

General, Transmission and Distribution: Different types of power stations, Load factor, diversity factor, demand factor, simple problems thereon, 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: Principles of a extinction by oil and air, H.R.C. fuses, Protection, earth leakage, over current, Buchhotz relay, Merz- Prince system of protection of generators & transformers, protection of feeders and bus bars. Lightning arresters, Various transmission and distribution systems, Comparison of conductor materials, efficiency for different systems. Utilization of Electrical Energy, Illumination, electric heating, Electric welding, electroplating, electric drives and motors.

- **Mechanical Engineering**

Flow of Fluids: Laminar & turbulent flow, equation of continuity, Bernoulli's theorem, measurement of discharge, flow through pipes, friction losses, Forces of jet impinging on vanes, blades, work done and efficiency, classification of turbines & pumps.

Thermal Engineering:

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Laws of thermodynamics, change in entropy in various processes; uses of steam, Properties of steam table & charts; Construction & Working of Cochran, Lancashire locomotive & Babcock & Wilcox boilers, working of steam turbine, Otto & Diesel Cycles, working of IC engines, Carburetion, Solex Carburettor. Diesel fuel, pump & injector: Cooling & lubrication.

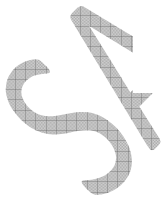
Production Engineering: Foundry- Different casting processes, concept of Patterns; types of mould making, purring defect in castings, causes & remedies, Welding- classification and types of welding, Testing and defects in welds. Lathes- working of lathe, various tools, operation on lathes, types of lathes. Drilling operations performed on drilling machines. Description, principles of working and various operations on machine tools, milling machine, shaper, grinder, boring and slotting machines.

Strength of Materials: Stresses in composite bars, relation between elastic constants, Resilience under different types of loads, SF and BM diagrams; stresses in beams- combined direct and bending stresses, Struts and columns – Euler's and Rankin's theories, Torsion of circular shafts.

Theory of Machines: Simple Machines – Four bar chain, Slider crank chain, double slider crank chain, Flywheel – Turning moment diagrams. Fluctuation of energy, Friction-in collar and pivots, plate clutch, conical clutch, journal bearing. Transmission of power through flat and V-belts, Gears, profile of gears, Governors- Watt and Hartnell governors

To measure candidate's reasoning ability, quantitative aptitude and proficiency in English and General Awareness

- Test of Reasoning
- Test of Quantitative Aptitude
- Test of General Awareness and Test of English Language



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