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**JAMMU AND KASHMIR PUBLIC SERVICE COMMISSION**  
**Solina, Srinagar – 190009**

**Subject:** Syllabus for the Screening Test for the posts of Assistant Engineer Electrical and Mechanical.

**Notice**

**Dated:-01.04.2017**

**Syllabus for the post of AE (Electric) in Power Development Department.**

Primary and secondary cells, Dry accumulators, Solar Cells, Steady state analysis of d.c. and a.c. network, network theorems; network functions, Laplace techniques, transient response; frequency response; three- phase networks; inductively coupled circuits.

Mathematical modelling of dynamic linear systems, transfer functions, block diagrams; stability of control systems.

Electrostatic and magnetostatic field analysis; Maxwell's equations. Wave equations and electromagnetic waves.

Basic methods of measurements, standards, error analysis; indicating instruments, cathode ray oscilloscope, measurement of voltage; current; power resistance, inductance, capacitance, frequency, time and flux, electronic meters.

Vacuum based and Semi conductor devices and analysis of electronic Circuits; single and multistage audio, and radio, small signal and large signal amplifiers; oscillators and feedback amplifiers; wave shaping circuits and time base generators: multi-vibrators and digital circuits; modulation and demodulation circuits, Transmission line at audio, radio and U.H. Frequencies; Wire and Radio communication.

Generation of e.m.f. and torque in rotation machine; motor and generator characteristics of d.c. synchronous and induction machines, equivalent circuits; commutation starters; phaser diagram, losses, regulation, power transformers.

Modelling of transmission lines, steady, state and transient stability, surge phenomena and insulation coordination; protective devices and schemes for power system equipment.

Conversion of a.c. to d.c. and d.c. to a.c. controlled and uncontrolled power, speed control techniques for drives.

## **Syllabus for the post of AE (Mechanical) in Public Works Department.**

**Statics:** Simple applications of equilibrium equations.

**Dynamics:** Simple applications of equations of motion, simple harmonic motion, work energy, power.

**Theory of Machines:** Simple examples of links and mechanism. Classification of gears, standard gear tooth profiles, Classification of bearing. Function of fly wheel. Types of governors. Statics and dynamic balancing. Simple examples of vibration of bars. Whirling of shafts.

**Mechanics of solids:** Stress, strain, Hook's Law, elastic moduli, Bending moments and shearing force diagrams for beams. Simple bending and torsion of beams springs, thinwalled cylinders Mechanical properties and material testing.

**Manufacturing Science:** Mechanics of metal cutting, tool life, economics of machining, cutting tool materials. Basic machining processes, types of machine tools, transfer lines, shearing, drawing, spinning, rolling, forging, extrusion. Different types of casting and welding methods.

**Production Management:** Method and time study, motion economy and work space design, operation and flow process charts. Product design and cost selection of manufacturing process. Break even analysis, Site selection, plant layout, Materials handling, selection of equipment for job, shop and mass production, Scheduling, despatching routing.

**Thermodynamics:** Heat, work and temperature, First and second laws of thermodynamics, Carnot, Rankine, Otto and Diesel Cycles.

**Fluid Mechanics:** Hydrostatics Continuity equation. Bernoulli's theorem. Flow through pipes. Discharge measurement. Laminar and Turbulent flow, concept of boundary layer.

**Heat Transfer:** Heat transfer by conduction, Convection and Radiation. One dimensional steady state conduction through walls and cylinders. Fins, Concept of thermal boundary layer. Heat transfer, coefficient, Combined heat transfer, coefficient, Heat exchangers.

**Energy Conversion:** Compression and spark ignition engines, Compressors, fans and blowers. Hydraulic pumps and turbines Thermal turbo machines.

**Boiler** Flow of steam through nozzles layout of power plants.

**Environmental Control** Refrigeration cycles, refrigeration equipment- its operation and maintenance, important refrigerants, Psychometrics comfort, cooling and dehumidification.

**Sd/-**

**Secretary**

**J&K Public Service Commission**