

Syllabus for JE (Electrical Engineering)

Qualification	Diploma(Electrical)
Topics / sub topics	
<p>Basic concepts: Concepts of resistance, inductance, capacitance, and various factors affecting them. Concepts of current, voltage, power, energy and their units. 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. simple series and parallel AC Circuits consisting of R.L. and C, Resonance, Poly Phase system – star and delta connection, 3 phase power,</p>	
<p>Measurement and measuring instruments: Measurement of power (1 phase and 3 phases, both real and reactive) and energy, 2 wattmeter methods of 3 phase power measurement. Measurement of frequency and phase angel. Ammeter and voltmeter (both moving oil and moving iron type), extension of range wattmeter, Multimeters, Megger, Energy meter, CLAMP ON Meter. Use of CRO, Signal Generator, CT, PT and their uses. Earth Fault detection .</p>	
<p>Electrical Machines: D.C. Machines – operation and maintenance of D.C. motors and generators, speed control and starting of D.C. Motors. Transformers – operation and maintenance of 1 phase /3 phase transformers. Auto transformers. Specifications of transformers, isolation transformers applications. 3 phase induction motors- operation and maintenance of 3 phase induction motors, starting and speed control of 3 phase induction motors. Operation and maintenance of Fractional Kilowatt Motors and Single Phase Induction Motors Electrical installation of above machines</p>	
<p>Generation, Transmission and Distribution – Different types of power stations, Load factor, diversity factor, demand factor, Power factor improvement techniques, Automatic Power Factor correction Units: Operation & Maintenance. Various types of tariffs, types of faults. Switchgears – rating of circuit breakers, MCB, MCCB, ELCB etc. Fuses, Protection against earth leakage / over current, etc. Buchholz relay, protection of feeders and bus bars. Lightning arresters, various transmission and distribution system, comparison of conductor materials. Cable – Different type of cables, cable jointing and termination methods, and rating.</p>	
<p>Estimation and costing: Code of practice for electrical wiring and installations as per CPWD norms- terminology, SOR, planning and specification of wires, switchgears etc. Estimation of lighting scheme, Design/Erection Installations, Operation & maintenance of substations (transformers & switches). Standby generating sets- commissioning procedures and tests. Switchgear panels, LT switchgears, relevant IE rules. Earthing practices- installation & maintenance, substation earthing and IE Rules. Street lighting systems. Service connection to buildings</p>	
<p>Utilization of Electrical Energy: Illumination- units and standard, principles of indoor and outdoor lighting design. Electric heating. Electric welding. Electroplating. Electric drives.</p>	
<p>Basic Electronics: Construction and working of various electronic devices e.g. P N Junction diodes, Transistors (NPN and PNP type), BJT and JFET. Simple circuits using these devices.</p>	
<p>UPS and Inverters- Concept of UPS, Difference between Inverters and UPS. Basic block diagram of UPS & operating principle, explanation of rectifier, battery, inverter. Types of UPS: Off line UPS, On line UPS, Line interactive UPS & their comparison, UPS specifications.</p>	

Amul
14-3-16