

## JT ELECTRICAL

### Syllabus for the written exam

**Electric Circuits and Networks:** Circuit elements, Ohms law, network Kirchoff's current and voltage laws

**Alternating Current Circuits:** R.M.S. value, average value, peak factor, form factor, phase and phase difference, Inductive & Capacitive reactance  $X_L$  &  $X_C$ , Impedance ( $Z$ ), power factor, (P.f), methods of power factor improvement, Phasor diagrams, Active and Reactive power, Simple problems on A.C. circuits, single phase & three phase systems, Both series & parallel power consumption, Concept of three-phase Star & Delta connection, Line voltage & phase voltage, current & power in a 3 ph ckt, with balanced and unbalanced load, Electrical Energy Consumption in single phase and three phase circuits.

**Transformers:** Construction and working principle of Transformer, Various components of a distribution transformer, classification of transformers, instrument transformers, Cooling of transformers, protective devices, specifications, simple problems on turns ratio. Transformer oil testing. Three phase transformers-vector groups, Parallel operations of transformer. Efficiency and voltage regulation of transformers and testing of transformers.

**Substations:** Classifications of substations, main electrical connections, and equipment layouts

**DC Generators:** Constructional details and working principles of DC generators. Various types of DC generators, components in a DC Generator.

**DC Motors:** Basic constructional details and working principles of DC Motors, Various types of DC Motors.

**Induction Motors:** Three phase and single-phase induction motors basic constructional details and working principles, Various types of Induction motors and starters, power and control circuits of induction motor starters.

**Alternators:** Basic constructional details and working principles of three phase alternator. Brush and brushless alternators. Parallel operation of alternators.

**Diesel Generators:** Operation and maintenance of LT Diesel Generator (DG) sets, and parallel operation of DG sets.

**Electrical measuring Instruments** - Types of instruments required for operation, maintenance and troubleshooting of various electrical equipments at a substation, and power distributions to load centers.

**Batteries:** Primary and secondary battery cells.

**Electric wiring:** Types of wirings, Specifications for wiring, Principle of laying out in domestic wiring and testing procedures.

**Lighting:** Types of lighting fixtures, lighting requirements for indoor and outdoor applications

**Underground Cables:** Constructional details, LT and HT cables, laying and testing procedures.

**Switchgears:** LT and HT switchgear.

**Earthing** - Principle of different methods of earthing, the importance of earthing, various types of earthing.

**Electrical Safety:** Safety techniques for human and electrical equipments.