

**ANNEXURE - I**  
**Syllabus for Written Test of AP Transco**  
**Assistant Executive Engineer (Electrical) - 2019**

**Electric Circuits:** Network graph, KCL, KVL, node and mesh analysis, star/ delta transformation; electromagnetic induction; mutual induction; ac fundamentals; harmonics, transient response of dc and ac networks; sinusoidal steady-state analysis, resonance, ideal current and voltage sources, Thevenin's, Norton's, Superposition and Maximum Power Transfer theorems, two-port networks, three phase circuits, power measurement .

**Electrical Machines:** Single phase transformer - equivalent circuit, phasor diagram, tests, regulation and efficiency; three phase transformers - connections, parallel operation; auto-transformer; DC machines - types, windings, generator/ motor characteristics, armature reaction and commutation, starting and speed control of motors; three phase induction motors - principles, types, performance characteristics, starting and speed control; single phase induction motors; synchronous machines - performance, regulation and parallel operation of generators, motor starting, characteristics and applications .

**Power Systems:** Basic power generation concepts; transmission line models and performance; underground cable, string insulators; corona; distribution systems; per-unit quantities; bus impedance and admittance matrices; load flow; voltage control; power factor correction; economic operation; symmetrical components; fault analysis; principles of over-current, differential and distance protection; protection of alternator, transformer, transmission lines neutral earthing, solid state relays and digital protection; circuit breakers; system stability concepts, swing curves and equal area criterion

**Utilization & Control Systems:** Principles of feedback; transfer function; block diagrams; steady-state errors; Routh and Nyquist techniques; Bode plots; root loci; lag, lead and lead-lag compensation; Heating - resistance, induction, dielectric; Welding – spot, seam and butt; Electric traction – speed-time curves, tractive effort;

**Measurements:** Bridges and potentiometers; PMMC, moving iron, dynamometer and induction type instruments; measurement of voltage, current, power, energy and power factor; digital voltmeters and multi-meters; phase, time and frequency measurement; Q-meters; oscilloscopes;

**Analog and Digital Electronics:** Characteristics of diodes, BJT, FET; amplifiers - biasing, equivalent circuit and frequency response; oscillators and feedback amplifiers; Combinational and sequential logic circuits; multiplexer; Schmitt trigger; A/D and D/A converters; 8-bit microprocessor basics, architecture, programming and interfacing.

**Power Electronics and Drives:** Semiconductor power diodes, transistors, thyristors, triacs, GTOs, MOSFETs and IGBTs - static characteristics and principles of operation; triggering circuits; phase control rectifiers; bridge converters - fully controlled and half controlled; principles of choppers and inverters; basic concepts of adjustable speed dc and ac drives.

**Model Question Paper**

The question paper consists of **one hundred** multiple choice objective type questions to be answered on the OMR answer sheet using HB pencil in **2 hours**. A few questions are given as a model below. **Note:** *Calculators are not allowed into the Examination Hall. Candidates have to bring their own pencils and erasers.*

1.The armature of a d.c machine is made of (A) Silicon steel (B) Wrought iron (C) Cast steel (D) Soft iron	A ●	B ○	C ○	D ○
2.The main drawbacks of d.c shunt generator is that (A)Shunt circuit has high resistance (B) Generator voltage is small (C) Terminal voltage drops considerably with load (D) It is expensive	A ○	B ○	C ●	D ○
3.Transformers usually transfer electrical energy from primary to secondary with change in (A) Frequency (B) Voltage (C) Power (D) Time period	A ○	B ●	C ○	D ○