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SYLLABUS FOR TEST (POST :ASSISTANT ENGINEER -ELECTRICAL)

1. **Electrical Circuits**: KVL, KCL, node and mesh analysis, star/delta transformation, electromagnetic induction, mutual induction, ac fundamentals, transient response of dc and ac networks, sinusoidal steady state analysis, resonance, ideal current and voltage sources, Network theorems, two-port networks, three phase circuits, power measurement in 3-phase circuits.

2. **Electrical Measurements:** Bridges and potentio meters, PMMC, moving coil, moving iron, dynamometer, induction type measuring instruments, measurement of voltage, current, power, energy, power factor, digital volt meters, multi-meters, ,phase, frequency measurements, Q-meters, oscilloscopes
3. **Control Sytems**:Principles of feedback control systems, transfer function, block diagram reduction,signal flow graph, Mason's,gain formula,time response, steady state error,Routh , Nyquist criterion,Bode plot, root locus, compensation design
4. **Analog and digital electronics:** Chacteristics of p-n diode, Zener diode, BJT, FET, amplifiers, biasing, low frequency and high frequency equivalent circuits, frequency response, feedback amplifiers, oscillators, combinational and sequential logic circuits, multiplexer, Schmitt trigger, A/D, D/A converters, basics of 8-bit, 16 bit microprocessors, architecture, programming, interfacing
5. **Electrical Machines:** Single phase transformer, equivalent circuit, phasor diagram,tests, regulation, efficiency,3-phase transformers, connections, parallel operation,auto transformer, DC machines: types, armature windings,characterstics of dc generators and motors, armature reaction, commutation,starting and speed control of dc motors
   3-phase induction motors: principle of operation, types, characteristics, computation of performance, equivalent circuit, starting and speed control
   Single phase induction motors: types, methods of starting, characteristics
   Synchronous Machines:emf equation, armature reaction, equivalent circuit, regulation, parallel operation, load sharing, operation with infinite busbars, synchronous motor, synchronous condensor, V and Inverted V curves
6. **Power Systems:** Basic power generation concepts, transmission line models and performace, Under ground cables, string insulators, corona , distribution systems, per unit quantities, bus impedance and admittance matrices, load flow studies, voltage control, power factor correction, economic operation, symmetrical components, fault analysis, principles of over current, differential, and distance protection, protection of alternators, protection of transformers, proection of transmission lines, protection from lightning, neutral grounding, circuit breakers, types and operation of CBs, system stability concept, swing curves, equal area criterion
7. **Utilization:** Electric heating, resistance heating, induction heating, dielectric heating, Electric traction, lighting calculations, types of lamps and their working
8. **Power Electronics and Drives:** SCR, IGBT, MOSFET, static and dynamic characteristics, triggering circuits, phase control rectifiers, bridge rectifiers, principles of dc-dc converters, Inverters, basic principles and characteristics of adjustable speed dc and ac drives

<u>Instruction to Candidates</u>

- The question paper consists of 100 multiple choice questions
- The answer are to be marked on separate OMR answer sheet using **blue or back ball point pen.**The answer can not be erased once it is marked. **Use of white correction fluid is strictly prohibited.**
- The duration of the test is 2hrs (120 minutes)



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Sample questions

1. The connection used for 11 kV/440 V distribution transformer is

   (A) Delta-delta (B) Star -delta
   (C) Delta-star (D) Star-star

2. In short circuit test of transformer iron losses are neglected because

   (A) Mutual flux is small (B) Copper losses are high
   (C) Secondary current is small (D) Primary current is small

3. The rating of lightning arrestor used for protection of 132 kV transformer is

   (A) 132kV, 5 kA (B) 120 kV, 10 kA
   (C) 120 kV, 5 kA, (D) 76.2 kV,10kA

4. The speed time curve used for main line traction is

   (A) trapezoidal (B) triangular
   (C) quadrilateral (D) rectangular

Answers:

Q.No	A	B	C	D
1.	○	○	●	○
2.	●	○	○	○
3.	○	●	○	○
4.	●	○	○	○