Rajasthan Public Service Commission, Ajmer
Syllabus for Screening Test for the post of Lecturer, Electrical Engineering
Technical Education Department

1. **Electrical Machines**

   Basic concept of rotating machines- e.m.f and torque equation, principle of energy conversion. DC Machines- characteristics, armature reaction, commutation, speed control of DC Motor, testing of DC Machine. Single phase and three phase transformers- phasor diagram, losses, regulation and efficiency, parallel operation of transformer, poly phase connection of transformers, Three phase induction machine-torque slip characteristics, efficiency, tests, applications, single phase induction motor- principle, starting methods, characteristics, applications, special machines. Synchronous machine - phasor diagram, voltage regulation, V-curves, synchronizing power, parallel operation and application.

2. **Power System**

   Supply system, modelling of transmission lines, insulator, corona, cables, power system stability, protective devices and schemes for power system equipment, fault analysis-per unit quantities, bus admittance and impedance matrix, load flow study, voltage control, and power factor correction, conventional and non conventional generating plants, economic operation of power system, grid substation.

3. **Circuit Analysis**

   Circuit elements and their characteristics, steady state analysis of DC and AC network, network theorems, network functions, poly phase circuits, two port network, network synthesis, transient response, inductively coupled circuits, resonant circuit. Basic principle of electromagnetic and electrostatic field theory, Maxwell's equation, wave equation and electromagnetic waves.

4. **Control System**

   Open loop & closed loops control system, transfer function, transient and steady state response, Stability criterion –Routh -Hurwith , Root locus, Nyquist. Compensating network, State variable representation and analysis of control systems.

5. **Measurement and Instrumentation**

   Analog & Digital Measuring Instruments and their applications, cathode-ray oscilloscope, Instrument transformers, Transducers, AC Bridges, Measurement of Resistance, Potentiometers.

6. Power Electronics

Power semiconductors devices, thyristors-characteristics, principle of operation, triggering circuits, convertors, chopper, inverter, cyclo-converter, SMPS, basic concepts of speed control of DC and AC drives.

7. Electronic Devices & Circuits

Semiconductor physics, junction diode, transistors, JFET & MOSFET, analysis of electronic circuits, single & multistage audio & radio small and large-signal amplifiers, oscillators, feedback amplifiers, wave shaping circuits, time base generators, multi-vibrator, digital circuits, modulation and demodulations circuits, logic gates, combinational and sequential digital systems.

8. Microprocessor & Computer

Introduction to 8085 Microprocessor Architecture, Inter facing, Instruction set, assembly language programming, Basic concepts of C++ programming.

Pattern of Question Paper

1. Objective type paper
2. Maximum marks- 100
3. Number of questions 100
4. Duration of paper - 2 hours
5. All question carry equal marks
6. There will be negative marking