Entrance Examination Syllabus of M.Sc. in Power System Engineering

1. **Power System lines**
   Structure of electric power systems, Components: generation, transmission, distribution, Single line diagrams, Active and reactive power, power factor, Per Unit System - Base quantities and conversions, Advantages of per unit representation, Transmission line parameters (R, L, C, G), Short, medium, and long line models, ABCD constants, Performance of transmission lines (voltage regulation, efficiency), Corona and its effects
2. **Power Flow Analysis**
   Bus classification: Slack, PV, PQ, Load flow problem formulation, Gauss–Seidel method, Newton–Raphson method (concept and comparison), Fault Analysis- Symmetrical components, Sequence networks, Types of faults: LG, LL, LLG, 3-phase, Fault current calculation, Bus voltages under fault conditions
3. **Power System Protection**
   CTs and PTs, Overcurrent, differential, and distance protection (basic principles), Circuit breakers, Principle of overcurrent, differential and distance protection, transformer protection, alternator protection, feeder and line protection, solid state relays and digital protection
4. **High Voltage Engineering**
   Overvoltage (lightning and switching), Insulation coordination, Basic concept of EHV transmission, Generation, testing, Switching and lightening overvoltage, Protection against overvoltage, Dielectric breakdown