



UNIVERSITY OF DELHI

Scheme of Examination for Direct Recruitment to the post of Assistant Engineer (Electrical)

The following shall be the scheme of Examination, components of written test and its syllabus etc. for recruitment to the post of **Assistant Engineer (Electrical)** by the direct recruitment:

A. Scheme of the Examination:

Written Test		
Paper – I MCQ Type (Questions will be of B.Tech./B.E. or equivalent level)	Time: 1 hours	Max. marks allowed: 100 marks
Paper-II Descriptive Type (Questions will be of B.Tech./B.E. or equivalent level)	Time: 2 hours	Max. marks Allowed: 100 marks
Total Marks		200 marks

Syllabus for the above papers will be as follows:

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 potentiometers, PMMC, moving coil, moving iron, dynamometer, induction type measuring instruments, measurement of voltage, current, power, energy, power factor, digital volt-meters, phase, frequency measurements, Q-meters, oscilloscopes

3. Control Systems

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

Characteristics 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, basic 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, characteristics of dc generators and motors, armature reaction, commutation, starting and speed control of dc motors

3-phase induction motors: principle of operation, types of 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 condenser, V and Inverted V curves

6. Power Systems

Basic power generation concepts, transmission line models and performance, 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, protection 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 calculation, types of lamps and their working

8. Power Electronics and Drives

SCR, IGBT, MOSFET, Static and dynamic characteristics, triggering circuits, phase control rectifier, bridge rectifiers, principles of dc-dc converters, inverters, basic principles and characteristics of adjustable speed dc and ac drives

Note:

1. The minimum qualifying marks for Paper I and Paper II separately shall be 45% for the unreserved posts and 40% for the posts reserved for OBC category and 35% for the posts reserved for SC/ST/PwD category.
2. Answer script of Paper-II of a candidate would be evaluated only if he/she qualifies in Paper-I.
3. There shall be no negative marking for wrong answers.
4. The question paper shall be in English but the applicant will have the option to respond either in English or Hindi. However, the same medium of language must be used throughout.
5. Merit shall be drawn only for candidates who qualify both the Paper I and Paper II separately. The Merit shall be drawn on the basis of combined scores of the two papers.
6. In case of bunching/bracketing of candidates in the results of the written test, the priority/merit list would be decided as follows:
 - a) The candidate having more marks in aggregate in the examination/degree/diploma which is defined as the minimum eligibility for the respective post will be given preference.
 - b) In case of further bunching/bracketing of candidates, candidate senior in age will be given preference.

**DEPUTY REGISTRAR
(RECRUITMENT)**