



UNIVERSITY OF DELHI

Scheme of Examination for Direct Recruitment to the Post of Assistant Engineer (Civil)

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

Fundamental concepts: Classification of Surveys; Chain Surveying; Compass Surveying; Levelling and Contouring; Theodolite Surveying; Tachometry; Curves; Introduction and fundamental concepts of electronic measuring instruments – EDM, Total Station, GIS &GPS

2. Construction materials &Practice

Properties and uses of construction materials – Stones, Bricks, tiles, Sand, Cement, Timber, Plastics, Glass, Asbestos, Paints, Distempers, Enamels and Varnishes; Preparation of Cement Mortar For various works

Classification of Buildings as per NBC, Site investigation for foundation as per NBC – Trial Pit and auger boring, classification of foundations, construction of spread footing and well foundation; Stone and Brick masonry types and principles of construction; Doors and Windows – types fittings and fastenings, types and functions of Lintels, Sunshades and Roofs, Flooring –

Construction and types of material; Types of Stairs; Scaffolding; Types of Plastering, Pointing painting and white / Colour Wash.

3. Engineering Mechanics and Strength of materials

Forces- types of forces, Parallelogram, Triangle and Polygon Law of Forces, Lami's theorem; Centre of Gravity and moment of Inertia; Simple stresses and strains, Hooke's law –stress strain diagram, working strength elastic constants, Poisson's ratio, Relationship between elastic constants, compound rods, temperature stresses, strain energy, proof resilience, impact loading; Shear force and bending moment diagrams for simply supported, over hanging and cantilever beams, relation between intensity of loading, Shear force and bending moment; Theory of simple bending, modulus of section, moment of resistance, distribution of shear stress in rectangular, circular and I- Sections ; Deflection in cantilever and simply supported beams subjected to simple loading; columns and struts - Euler's and Rankine's formulae, Slenderness ratio, simple built-up columns; Analysis of dam and retaining walls; Simple plane and pin-jointed trusses, Stresses by method of joints and method of sections.

4. Hydraulics

Properties of fluids, fluid pressure and its measurement; Types of flows, energies in fluid motion, Bernoulli's theorem and its applications – venture metre, pitot tube; Orifice and mouthpiece; Notches and weirs; Flow through pipes, hydraulic gradient line and total energy line, laminar and turbulent flow in pipes – Reynolds number, measurement of velocity; open channels; Water turbines - classification, centrifugal and reciprocating pumps; layout of hydroelectric power plant.

5. Quantity Surveying

Abstract estimate, detailed estimate – centerline and long & short wall method, various items of Civil Engineering works as per Indian Standards; General Specifications – earth work, brick / stone masonry in cement mortar, RCC, plastering in cement mortar, Floor finishes with ceramic tiles and marbles, white washing. Colour washing; Standard schedule of rates, lead and lift preparation of lead statement; Computation of earth work – Mid-ordinate, mean Sectional area, Trapezoidal method, Prismoidal Rule; Approximate estimate-Plinth area and cubic rate estimate.

6.Design of Structures (RCC and Steel)

RCC structures: Design philosophies- principles and concepts of working stress method and limit state method, loads and permissible stresses, IS specification, analysis and design-rectangular beam, slab, T-beam, column, footing and stair case.

Steel Structures: Properties of steel section, loads and permissible stresses, IS specifications, Analysis and design- welded joints, beam, column, base tension member; Design of roof truss.

7. Irrigation Engineering

Definition, Duty, delta, base period, rainfall and its measurement, factors affecting runoff methods of computing maximum flood discharge; Classification of head works, component parts

of a weir and barrage, factors influencing selection of site –reservoirs and dams; Classification of canals, canal lining, cross drainage works; Soil erosion, water logging, soil water plant relationship; Necessity of irrigation - advantages and disadvantages, irrigation methods.

8. Environmental Engineering

Basics of ecosystem, water supply scheme; Sources of water; Conveyance of water – pipes, joints and laying; Testing of water, drinking water standards; Treatment of water, Distribution of water; Water supply connection to a building.

Quantity of sewage, surface drains, design of sewers running half full, limiting velocities; laying of sewers, sewage, sewer appurtenances; Collection of sewage samples, characteristics of domestic and industrial sewage-BOD, COD; Sewage treatment, septic tank & soak pit, sewage disposal-dilution and sewage farming; House drainage arrangements in buildings; solid waste-collection and disposal; Air Pollution-sources, effects and controlling methods.

9. Transportation Engineering

Alignment of roads-plain and hilly terrain, surveys; Cross section of road structure, width of pavement, Chamber, Gradient, Super elevation, Transition curves, horizontal and vertical alignment; Pavement making, traffic signs, traffic islands.

Types of soil, classification of soil-Textural IS Classification, physical properties-plasticity, cohesion, consolidation, compaction, permeability, compressibility, soil moisture content, specific gravity, density; Bearing capacity of soil

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)**