

Test type: Written Exam (Multiple Choice Questions)

Test period: 2 Hours

Total marks: 100

**Syllabus for the post of Junior Engineer**

Subject	Topic	Weightage
General English	<ul style="list-style-type: none"><li>▪ Comprehension, One word substitution, Synonyms and Antonyms,</li><li>▪ Spelling error, Spotting error in sentences,</li><li>▪ Grammar Noun, Pronoun, Adjective, Verb, Preposition, Conjunction,</li><li>▪ Use of 'A', 'AN' and 'THE',</li><li>▪ Idioms and Phrases</li></ul>	5 Questions each 1 mark [5]
General Knowledge	<ul style="list-style-type: none"><li>▪ Indian History, Indian Geography, Indian Economy, Indian Polity &amp; Constitution,</li><li>▪ Scientific Research, awards,</li><li>▪ Sports,</li><li>▪ Current Affairs-India &amp; World</li></ul>	8 Questions each 1 mark [8]
Logical Reasoning	<ul style="list-style-type: none"><li>▪ Analogies - Semantic Analogy, Symbolic / Number Analogy, Figural Analogy,</li><li>▪ Similarities and differences, word building, relation concepts,</li><li>▪ Arithmetic number series, Semantic Series, Number Series,</li><li>▪ Coding and Decoding - small &amp; Capital Letters / numbers coding, decoding and classification</li></ul>	7 Questions each 1 mark [7]
Quantitative Aptitude	<ul style="list-style-type: none"><li>▪ Number System,</li><li>▪ Time and Work,</li><li>▪ Averages, Percentages,</li><li>▪ Profit and loss,</li><li>▪ Ratio and Proportions,</li><li>▪ Simple and Compound Interest, Time and Distance</li></ul>	10 Questions each 1 mark [10]
Computer Literacy	<ul style="list-style-type: none"><li>▪ Characteristics of Computer, Computer Organisation including RAM, ROM, File System, Input Devices,</li><li>▪ Computer Software - Relationship between Hardware and Software,</li><li>▪ Operating System, MS-Office (exposure of Word, Excel/spread sheet, Power point),</li><li>▪ Digital Signatures, Application of information technology in Government for E- Governance</li></ul>	5 Questions each 1 mark [5]

Subject	Topic	Weightage
Estimating, Costing and Valuation	<ul style="list-style-type: none"> <li>▪ Estimate, glossary of technical terms, analysis of rates, methods and unit of measurement,</li> <li>▪ Items of work – Earthwork, RCC work, Shuttering,</li> <li>▪ Centre line method, Mid-section formula, Trapezoidal formula,</li> <li>▪ Simpson’s rule.</li> <li>▪ Valuation – Value and cost, scrap value, salvage value, assessed value, sinking fund, depreciation and obsolescence, methods of valuation.</li> </ul>	5 Questions each 1 mark [5]
Surveying	<ul style="list-style-type: none"> <li>▪ Principles of surveying, measurement of distance, chain surveying, working of prismatic compass,</li> <li>▪ compass traversing, bearings, local attraction,</li> <li>▪ plane table surveying, theodolite traversing, adjustment of theodolite, Levelling,</li> <li>▪ Definition of terms used in levelling, contouring, curvature and refraction corrections,</li> <li>▪ temporary and permanent adjustments of survey instruments,</li> <li>▪ methods of contouring, uses of contour map,</li> <li>▪ tachometric survey, curve setting, earth work calculation, advanced surveying equipment e.g. Total Station, DGPS, GPS etc.</li> <li>▪ Use of Remote Sensing Techniques in planning of WR projects</li> </ul>	20 Questions each 1 mark [20]
Geotechnical Engineering	<ul style="list-style-type: none"> <li>▪ Soil Type and structure – gradation and particle size distribution – consistency limits.</li> <li>▪ Properties of soils, classification and interrelationship;</li> <li>▪ Compaction behaviour, methods of compaction and their choice,</li> <li>▪ Laboratory and field tests, Earth pressure theory and analysis for retaining walls,</li> <li>▪ Bearing capacity of soil - stability of slope of earth walk.</li> <li>▪ Type and properties of Rocks including laboratory and field testing.</li> </ul>	4 Questions each 1 mark [4]
Foundation Engineering	<ul style="list-style-type: none"> <li>▪ Types of foundations,</li> <li>▪ Selection criteria for foundation of structures, bearing capacity, settlement,</li> <li>▪ Types of piles and their layout.</li> <li>▪ Foundations on expansive soils, foundation on swelling soils.</li> </ul>	4 Questions each 1 mark [4]

Subject	Topic	Weightage
Hydraulics	<ul style="list-style-type: none"> <li>▪ Fluid properties,</li> <li>▪ hydrostatics,</li> <li>▪ measurements of flow,</li> <li>▪ Bernoulli's theorem and its application, flow through pipes,</li> <li>▪ flow in open channels,</li> <li>▪ weirs, flumes, spillways, pumps and turbines</li> </ul>	4 Questions each 1 mark [4]
Irrigation Engineering	<ul style="list-style-type: none"> <li>▪ Definition, necessity, benefits, effects of irrigation, types and methods of irrigation,</li> <li>▪ Water requirement of crops, duty, delta and base period, Kharif and Rabi Crops, Command area, Time factor, Crop ratio, Overlap allowance, Irrigation efficiencies.</li> <li>▪ Different type of canals, types of canal irrigation, canal capacity, canal losses, alignment of main and distributory canals,</li> <li>▪ Canal lining – types and advantages.</li> <li>▪ Canal structures: Description of head regulators, canal falls, aqueducts, metering flumes and canal outlets.</li> <li>▪ Diversion headwork: Description of weirs of permeable and impermeable foundation, Silt and Scour, Kennedy's theory of critical velocity, Lacey's theory of uniform flow.</li> <li>▪ Storage works: Types of dams.</li> <li>▪ Spillways: Spillway types, energy dissipation.</li> </ul>	15 Questions each 1 mark [15]
Concrete Technology	<ul style="list-style-type: none"> <li>▪ Properties, Advantages and uses of concrete,</li> <li>▪ Cement aggregates, importance of water quality, water cement ratio, workability, mix design, storage, batching, mixing, placement, compaction, finishing and curing of concrete,</li> <li>▪ Quality control of concrete, hot weather and cold weather concreting,</li> </ul>	3 Questions each 1 mark [3]
Hydrology	<ul style="list-style-type: none"> <li>▪ Measurement of rainfall, rain gauge and related data analysis e. g. Rainfall – Runoff analysis, Thiessen polygon,</li> <li>▪ PMP, precipitation, Evaporation and transpiration,</li> <li>▪ Overland flow, unit and synthetic hydrograph,</li> <li>▪ Floods and their management, flood frequency analysis etc.</li> </ul>	10 Questions each 1 mark [10]