



HRIDHA Series



SSC

Staff Selection Commission

Junior Engineer

CPWD

Recruitment Examination

Civil Engineering

15

Practice Papers

15 Practice Papers &
**Contains:- 10 Previous Years Solved Papers
(2008-2017)**

KHANNA PUBLISHERS

SSC-JE
JUNIOR ENGINEERS
(CPWD) RECRUITMENT EXAMINATION
Civil Engineering
10 Solved Papers (2008-2017)
&
15 Practice Papers

Compiled by

Khanna Editorial Team



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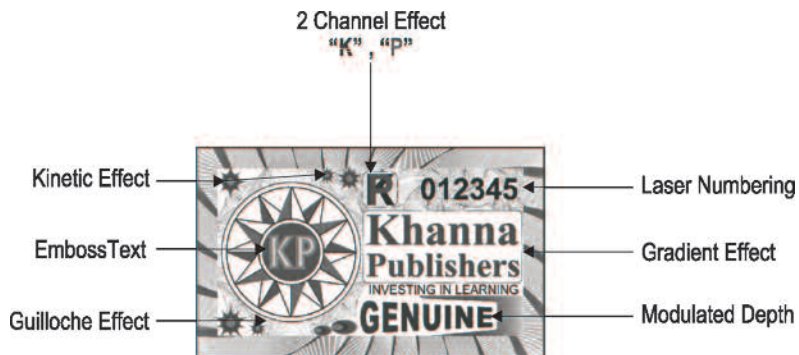
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First Edition : 2017

Preface

The book has been designed as per the latest syllabus prescribed for SSC—Junior Engineer (CPWD) Examination. SSC-JE is conducted every year by Staff Selection Commission for the recruitment of Junior Engineer for government departments such as CWC, MES and CPWD. We, as a leading publisher in technical books, made an attempt to provide the complete preparation book with 10 years solved papers and 15 solved practice papers. These practice papers help students to learn and evaluate their skills on the subject. Each paper covers the important sections of this examination—General Intelligence and Reasoning, General Awareness and General Engineering. This book is comprised into two parts—10 years solved papers and practice papers. This book will serve the purpose for the students who are preparing for Junior Engineering Examinations.

The main objective of this book is to guide the students about the technique of questions asked in the examinations. Important questions of previous years examinations have been included in each chapter. The latest updates have been included in general awareness. Objective and Subjective questions arranged separately in Paper 1 and Paper 2.

Every attempt has been made to make this book student friendly. Any suggestion made by the students to improve the usefulness of the book are welcomed.

—Publishers

Syllabus

SSC: JUNIOR ENGINEER (CPWD)

SCHEME OF EXAMINATION

Written Test: It will consist of two papers:-

Papers	Subjects	Maximum Marks	Duration
STAGE I: Paper 1	General Intelligence & Reasoning	50 marks	2 hours
	General Awareness	50 marks	
	General Engineering: Civil & Structural	100 marks	
STAGE II: Paper 2	General Engineering: Civil & Structural	300 marks	2 hours
STAGE III:	Personal Interview	100 marks	-----

Note: SSC JE written exam will be held in two stages namely Paper-1 and Paper-2.

SSC JE Paper-1: Paper 1 contains three parts namely (A) General Intelligence & Reasoning (50 marks), (B) General Awareness (50 marks), and (C) General Engineering (100 marks).

SSC JE Paper-1 will be objective type (carry 200 marks and exam duration will be 2 hours). There will be negative marking of 0.25 marks for each wrong answer in Paper-1 only.

SSC JE Paper-2: Conventional type and carries three parts in which candidates need to attempt only one part relevant to the applied JE post. (Paper-2 carries 300 marks and exam duration will be 2 hours). The interview/personality test is structured in such a manner that the candidates' interest, knowledge, various traits, aptitude, suitability etc. are probed among other things, through academic qualifications, experience, extra-curricular activities, general awareness/knowledge, depth of knowledge of the subjects

studied (10 + 2 onwards), communicative skill and over-all personality etc. Candidates called for interview/personality test, have the option to converse either in Hindi or English language during the interview process.

SYLLABUS

General Awareness

Questions will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of everyday observations and experience in their scientific aspect as may be expected of any educated person.

The test will also include questions relating to India and its neighboring countries especially pertaining to Sport, History, Culture, Geography, Economic Scene, General Polity, Indian Constitution and Scientific Research, etc. These questions will be such that they do not require a special study of any discipline.

General Engineering (Civil and Structural)

BUILDING MATERIALS: Physical and Chemical properties, classification, standard tests, uses and manufacture/quarrying of materials e.g. building stones, silicate based materials, cement (Portland), Asbestos products, Timber and Wood based Products, laminates, bituminous materials, paints, varnishes.

ESTIMATING, COSTING AND VALUATION : Estimate, glossary of technical terms, analysis of rates, methods and unit of measurement.

SURVEYING: Principles of surveying, working of properties, compass and bearing, plane table surveying, theodolite traverse, adjustment of theodolite, levelling and contouring, curvature, refraction, permanent adjustment of dumpy level, methods of contouring and uses of a control map, tachometric survey.

SOIL MECHANICS: Origin of soil phase diagram, definitions of void ratio, porosity, degree of saturation, water content, specific gravity of soil grains and unit weights, grain size distribution curves for different soil and their uses. Atterberg's limits, ISI soil classification, plasticity chart, coefficient of permeability, effective stress, consolidation of soils.

HYDRAULICS: Fluid properties, hydrostatics, measurements of flow, Bernoulli's theorem and its application, flow through pipes, flow in open channels, weirs, flumes, spillways, pumps and turbines.

IRRIGATION ENGINEERING : Definition, necessity, benefits, effects of irrigation, types and methods of irrigation, Hydrology – Measurement of rainfall, run off coefficient, rain gauge, losses from precipitation – evaporation, infiltration, etc. Water requirement of crops, duty, delta and base

period, Kharif and Rabi Crops, Command area, Time factor, Crop ratio, Overlap allowance, Irrigation efficiencies. Different type of canals, types of canal irrigation, loss of water in canals. Canal lining – types and advantages. Shallow and deep to wells, yield from a well. Weir and barrage, Failure of weirs and permeable foundation, Slit and Scour, Kennedy's theory of critical velocity. Lacey's theory of uniform flow. Definition of flood, causes and effects, methods of flood control, water logging, preventive measure. Land reclamation, Characteristics of affecting fertility of soils, purposes, methods, description of land and reclamation processes. Major irrigation projects in India.

TRANSPORTATION ENGINEERING : Highway Engineering – cross sectional elements, geometric design, types of pavements, pavement materials – aggregates and bitumen, different tests, Design of flexible and rigid pavements – Water Bound Macadam (WBM) and Wet Mix Macadam (WMM), Gravel Road, Bituminous construction, Rigid pavement joint, pavement maintenance, Highway drainage, Railway Engineering- Components of permanent way – sleepers, ballast, fixtures and fastening, track geometry, points and crossings, track junction, stations and yards. Traffic Engineering – Different traffic survey, speed-flow-density and their interrelationships, intersections and interchanges, traffic signals, traffic operation, traffic signs and markings, road safety.

ENVIRONMENTAL ENGINEERING: Quality of water, source of water supply, purification of water, distribution of water, need of sanitation, sewerage system, circular sewers, oval sewer, sewer appurtenances, surface water drainage, sewage treatments.

STRUCTURAL ENGINEERING : Theory of structures: Elasticity constants, type of beams, determinate and indeterminate, bending moment and shear force diagrams of simply supported, cantilever and over hanging beams. Moment of area and moment of inertia for rect. & circular section, bending moment and shear stress for tee, channel and compound sections, chimneys, dams and retaining walls, eccentric loads, slope deflection of simply supported and cantilever beams, critical load and columns, torsion of circular section.

CONCRETE TECHNOLOGY: Properties, Advantages and uses of concrete, cement aggregates quality, water cement ratio, workability, mix design, storage, batching, mixing, placement, compaction, finishing and curing of concrete, quality control of concrete, hot weather and cold weather concreting, repair and maintenance of concrete structure.

RCC DESIGN: RCC beam, flexural strength, shear strength, bond strength, design of single reinforced beams, lintels, cantilever beams, double reinforced beams, one way slabs, two way slabs, isolated footings, reinforced brick work. T-beams, columns, staircases, retaining walls, water tanks (RCC design questions may be based on both Limit State method and Working Stress method).

STEEL DESIGN: Steel design and construction of steel columns, beams, roof trusses, plate girders.

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