BTSC JE Syllabus 2024

The Bihar Technical Service Commission (BTSC) will shortly hold a written test to shortlist candidates for the various Junior Engineer positions. Candidates wishing to be selected as BTSC Junior Engineers should review the detailed BTSC JE Syllabus For Civil Engineering below.

BTSC JE Syllabus for General Studies

Topics for General Studies covered in BTSC JE Syllabus	
Current Affairs	Science and Technology
Indian History	Static GK
Indian Geography	Sports
Indian Polity	Economic Scene

BTSC JE Syllabus for Civil and Structural Engineering

Topic	**Subtopics**
Building Materials	Physical and Chemical properties
	Classification
	Standard tests
	Uses and manufacture/quarrying of materials
	Asbestos products
	Timber and wood based products
	Laminates
	Paints

	Varnishes
Estimating, Costing and Valuation	Estimate
	Glossary of technical terms
	Analysis of rates
	Items of work – earthwork, Brick work (Modular & Traditional bricks), RCC work, Shuttering, Timber work
	Painting
	Flooring
	Plastering
	Water Tank
	Bar bending schedule
	Valuation – Value and cost, scrap value, salvage value, assessed value, sinking fund, depreciation and obsolescence, methods of valuation
Surveying	Principles of surveying
	Measurement of distance
	Chain surveying
	Working of prismatic compass
	Local attraction
	Plane table surveying
	Adjustment of theodolite

	Leveling
	Definition of terms used in leveling
	Contouring, curvature and refraction corrections
	Temporary and permanent adjustments of dumpy level
	Tachometric survey
	Advanced surveying equipment
Soil Mechanics	Origin of soil
	Phase diagram
	Definitions-void ratio
	Density index and interrelationship of different parameters
	Grain size distribution curves and their uses
	Index properties of soils
	Atterberg's limits
	ISI soil classification and plasticity chart
	Permeability of soil
	Triaxial test
	Soil compaction
	Laboratory compaction test
	Maximum dry density and optimum moisture content

	Bearing capacity of soils
	Standard penetration test
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
	2II effects of irrigation
	Types and methods of irrigation
	Hydrology – Measurement of rainfall
	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
	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
	Major irrigation projects in India
Transportation Engineering	Highway Engineering – cross-sectional elements, geometric design, types of pavements
	Pavement materials – aggregates and bitumen
	Design of flexible and rigid pavements – Water Bound Macadam (WBM) and Wet Mix Macadam (WMM), Gravel Road
	Bituminous construction
	Rigid pavement joint
	Railway Engineering

	Components of permanent way – sleepers, ballast, fixtures and fastening
	Track geometry
	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 systems
	Circular sewer, oval sewer, sewer appurtenances, sewage treatments
	Surface water drainage
	Solid waste management – types, effects, engineered management system
	Air pollution – pollutants, causes, effects, control
	Noise pollution – cause, health effects, control
Theory of Structures	Elasticity constants
	Types of beams – determinate and indeterminate
	Bending moment and shear force diagrams of simply supported, cantilever and overhanging beams
	Moment of area and moment of inertia for rectangular & circular 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
	Importance of water 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 structures
RCC Design	RCC beams-flexural strength, shear strength, bond strength
	Design of singly reinforced and doubly reinforced beams
	Cantilever beams
	T-beams
	Lintels

	One way and two way slabs
	Isolated footings
	Reinforced brick works, columns, staircases, retaining wall, water tanks (RCC design questions may be based on both Limit State and Working Stress methods)
Steel Design	Steel design and construction of steel columns, beams
	Roof trusses
	Plate girders