

# BTSC JE Syllabus 2023



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- **Total Question: 100**
- **Total Marks: 100**
- **Total Time: 02 Hr**



### BTSC JE Syllabus For General Studies

- Indian History
- Science and Technology
- Static GK
- Sports
- Economic Scene
- Indian Geography
- Indian Polity
- Current Affairs- Both National & International

### BTSC JE Syllabus For Civil and Structural Engineering

The above examination will be conducted through Computer Based Test in more than one shift and due to conducting the examination in more than one shift, the result will be prepared to adopt the process of Normalization. Negative marking will be implemented for wrong answers in the examination. For each correct answer 01 mark will be given and for each wrong answer (0.25) will be deducted. (f) Adopting the process of normalization of the candidates on the basis of the said examination.

### Estimating, Costing and Valuation

- Estimate

- Painting
- Flooring
- Plastering
- Water Tank
- Bar bending schedule
- Items of work - earthwork, Brick work (Modular & Traditional bricks), RCC work, Shuttering, Timber work
- Glossary of technical terms
- Analysis of rates
- Valuation - Value and cost, scrap value, salvage value, assessed value, sinking fund, depreciation and obsolescence, methods of valuation

### **Soil Mechanics**

- Origin of soil
- Atterberg's limits
- Phase diagram
- Permeability of soil
- Triaxial test Soil compaction
- Laboratory compaction test
- Bearing capacity of soils
- Standard penetration test
- Density index and interrelationship of different parameters
- Grain size distribution curves and their uses
- Maximum dry density and optimum moisture content
- Definitions-void ratio
- Index properties of soils
- ISI soil classification and plasticity chart

### **Irrigation Engineering**

- Command area
- Time factor
- Types and methods of irrigation
- Hydrology – Measurement of rainfall
- Water requirement of crops, duty, delta and base period
- Kharif and Rabi Crops
- Crop ratio
- Definition, necessity, benefits
- 2II Effects of irrigation
- Weir and barrage
- 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
- Failure of weirs and permeable foundation
- Overlap allowance
- Irrigation efficiencies
- Different types of canals

### **Environmental Engineering**

- Need of sanitation
- sewerage systems
- circular sewer, oval sewer, sewer appurtenances, sewage treatments
- Surface water drainage
- Air pollution - pollutants, causes, effects, control
- Noise pollution - cause, health effects, control
- Quality of water, source of water supply, purification of water, distribution of water
- Solid waste management - types, effects, engineered management system

### **Concrete Technology**

- Importance of water quality
- Water cement ratio
- Workability
- Mix design
- Cement aggregates
- Quality control of concrete
- Hot weather and cold weather concreting
- Repair and maintenance of concrete structures
- Properties, Advantages and Uses of concrete
- Storage, batching, mixing, placement, compaction, finishing and curing of concrete

### **Steel Design**

- Steel design and construction of steel columns, beams roof trusses plate girders

### **Building Materials**

- Standard tests
- Laminates
- Paints
- Varnishes
- Physical and Chemical properties
- Classification
- Uses and manufacture/ quarrying of materials
- Asbestos products
- Timber and wood-based products

### **Surveying**

- Chain surveying

- Local attraction
- Plane table surveying
- Principles of surveying
- Measurement of distance
- Adjustment of theodolite
- Leveling
- Working of prismatic compass
- Tachometric survey
- Advanced surveying equipment
- Definition of terms used in levelling
- Contouring, curvature and refraction corrections
- Temporary and permanent adjustments of dumpy level

### **Hydraulics**

- Hydrostatics
- Measurements of flow
- Flow through pipes
- Bernoulli's theorem and its application
- Fluid properties
- Flow in open channels, weirs, flumes, spillways, pumps and turbines

### **Transportation Engineering**

- Pavement materials - aggregates and bitumen
- Bituminous construction
- Rigid pavement joint
- Railway Engineering
- Components of the permanent way - sleepers, ballast, fixtures and fastening
- Track geometry
- Highway Engineering - cross-sectional elements, geometric design, types of pavements
- Traffic Engineering - Different traffic survey, speed-flow-density and their interrelationships, intersections and interchanges, traffic signals, traffic operation, traffic signs and markings, road safety
- Design of flexible and rigid pavements - Water Bound Macadam (WBM) and Wet Mix Macadam (WMM), Gravel Road

### **Theory of Structures**

- Elasticity constants
- Critical load and columns
- Torsion of circular section
- Types of beams - determinate and indeterminate
- 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
- Bending moment and shear force diagrams of simply supported, cantilever and overhanging beams

## RCC Design

- Cantilever beams
- T-beams
- Lintels
- One-way and two-way slabs
- Isolated footings
- Reinforced brickworks, columns, staircases, retaining walls, water tanks (RCC design questions may be based on both Limit State and Working Stress methods)
- Design of singly reinforced and doubly reinforced beams
- RCC beams-flexural strength, shear strength, bond strength

## BTSC JE Exam Pattern 2023

The marks obtained after normalization will be used in the second stage for preparing the merit list. 40% backward class for general category in written examination by Personnel and Administrative Reforms Department, Bihar's resolution number-2374, dated-16.07.2007 and General Administration Department, Bihar's Resolution Memorandum-962, dated 22.01.2021 36.5% for OBC, 34% for Extremely Backward Classes and 32% for SC/ST, Women and Physically Challenged (Divyang) candidates, otherwise they will be out of the competition.

- Total Questions: 100
- Total Marks: 100
- Total Time: 02 Hours
- Correct Answer: 01 Marks
- Negative Marking: Yes(1/4 marks)

Subject	Que/ Marks
General Studies	20/20
Subject-specific (Civil Engineering)	80/80
<b>Total</b>	<b>100/100</b>

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