

RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

SYLLABUS FOR SCREENING TEST FOR THE POST OF JUNIOR ENGINEER CIVIL (DIPLOMA HOLDERS), PUBLIC HEALTH ENGINEERING DEPARTMENT

Part – A

- 1 प्राचीन सभ्यताएं – कालीबंगा, आहड़-बैराठ
- 2 मुगल शासन और राजपूत राज्य (1526–1707)
- 3 राजस्थान में स्वतंत्रता संग्राम एवं राजस्थान का एकीकरण (1857 से 1956)
 - वास्तुशिल्प एवं स्थापत्य – मन्दिर, दुर्ग व हवेलियां
 - राजस्थान के भक्त एवं संत
 - राजस्थान की संस्कृति – रीति-रिवाज, मेले, त्यौहार, उत्सव, व्रत एवं उपवास
 - राजस्थान की लोक परम्पराएं – नृत्य, गीत, संगीत व कलाएं
 - राजस्थान के सन्दर्भ में समसामयिक घटनाएं
 - राज्य प्रशासन – कार्यपालिका, व्यवस्थापिका एवं न्यायपालिका
 - जिला प्रशासन – जिलाधीश, उपखण्ड अधिकारी एवं तहसीलदार – कार्य एवं भूमिका
 - स्थानीय प्रशासन – ग्रामीण एवं नगरीय
 - राजस्थान का सामान्य भूगोल – स्थिति, आकार, विस्तार, प्रशासनिक विभाजन, स्थलाकृतिक स्वरूप, जलवायु, वनस्पति, अपवाह व कृषि
 - सर्वेक्षण – तलेक्षण (लैवलिंग) सर्वेक्षण की विशेषताएं व समस्याएं
 - राजस्थान के हस्तशिल्प, लघु उद्योग, वृहद् उद्योग, राज्य में संचालित योजनाएं ।

Part – B

Civil Engineering –

Strength of Materials :

Simple stress and strain, Relationship between various Elastic constants. Various mechanical properties of materials, Tensile Test, Bending Test, Compression Test, Toughness Test and Hardness Test.

Hook's Law, Principle of superposition, Thermal Stress and Strain, Working Stress, Ultimate Tensile Stress, Proof Stress, Shear Stress, Shear Strain, Poisson's ratio Volumetric Stress and Strain, Compound Stress, Mohr's Circle Method for principal stresses, strain energy due to various types of loading.

Bending moment and shear force diagrams, for simply supported and cantilever beams with point load and u.d.l.

Bending Stress and shear stress in beams for I, Rectangular, Channel, Circular, H and + Section Columns and Struts, Torsion of circular shaft, springs, Thin Cylindrical shells, Combined direct and bending stresses, Determinate frames.

Fluid Mechanics :

Properties and mechanics of fluid, fluid pressure and its measurement, Hydrostatics, Hydrokinematics, Hydro-dynamics and measurement of flow, orifices and Notches, Determination of coefficient of discharge for venturimeter and orifice meter, Determination of C_c, C_u, C_d of small orifices. Practical verification of Bernoulli's theorem, Flow through pipes and channels. Types and properties of Turbines and Pumps. Maintenance of pumps and turbines. Determination of coefficient of friction and various losses in pipes.

Building Technology and Construction Materials :

Types of Foundations, Various types of masonry, Scaffolding, shoring and underpinning. Types of materials – Bricks, Tiles, Stones, Lime, Cement, Timber, mortars, paints & varnishes and their various tests.

Survey :

Introduction, Chain survey, compass survey, Levelling, Contouring, Plane Table Surveying, Theodolite, Tacheometry, Trigonometrical levelling, traversing, Total Station and minor Instruments.

Soil Engineering :

Fundamentals, definition and relationship, Classification of soil. Properties of soil, permeability, compaction and consolidation of soil. Shear Strength, Bearing capacity and Earth pressure of soil. Determination of SBC by SPT and Plate Bearing Test.

Concrete Technology :

Types of Cement, various tests for cement. Types of Aggregates: Properties and their Testing-Types of concrete their grades and various tests of Concrete. Form work. Quality control at site, ready mixed concrete, ferro cement.

Public Health Engineering :

- 1 Water Supply Necessity and Development of water supply system. Quantity, quality and sources of water, Rural and Urban per-capita demand. Treatment of water. Conveyance of water, construction and maintenance of Filter Plants, Types of filters. Various Regulatory valves. Distribution system of water. Building water supply and Rural water supply. Various tests of water. Quality control and Testing in Domestic water supply.
- 2 **Sanitary Engineering** : Necessity of systematic collection and disposal of various types of waste, quantity, characteristics and composition of sewage.

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Building drainage and sewerage system. Various appurtenances, Laying and maintenance of sewers and sewage systems. Sewage Treatment and disposal, Rural sanitation. Determination of chlorides sulphates, BoD and CoD Tests of sewage sample.

- 3 **Irrigation Engineering** : Hydrology, Reservoir planning, Introduction of River Traming works, Diversion head works, Cross drainage works, Distributory works and well Irrigation, Rainwater harvesting and Ground Water Recharge.

Theory of Structures – Slope and deflection of various types of beams, Rolling loads and influence lines. Propped cantilever, fixed beams and continuous beams.

Estimating & Costing - Common items of works in Civil Engineering Construction and their units. Methods of measurement, Rate analysis of various items. Importance of specifications and detailed specification of various items. Contract system, Departmental procedure, Public works accounts. Stores, Tools and plants. Estimate of Septic Tank, water tank and small reservoir.

R.C.C. - Introduction of working stress and Limit State methods of design. Grades of Concrete and Steel. Analysis and Design of beams and Slabs. Design of Short Axially loaded columns and reinforcement details. Design of footing with uniform depth. Design of simple cantilever retaining walls. Introduction of pre-stressed concrete. Provision of IS-456- 2000 for R.C.C.

Steel Structure - Properties of Steel as per Is-226-1969. Riveted and welded connection. Design of Compression and tension members. Design of Slab base and Gusset Base. Design of Beams and lintels, provisions of IS-800-1984.

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Pattern of Question Papers :

- 1 Objective Type Question Paper.
- 2 Maximum Marks : 100
- 3 Number of Questions : 100
- 4 Duration of Paper : Two Hours.
- 5 All Questions carry equal marks.
- 6 There will be **Negative Marking**.
- 7 20% Questions will be from Part-A and 80% questions from Part-B.

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