

# RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

## SCHEME & SYLLABUS OF EXAMINATION FOR THE POST OF ASSISTANT ENGINEER- CIVIL (DEPARTMENT OF LOCAL SELF GOVERNMENT)

### Part-A

#### **Paper- General Knowledge and General Science including General Knowledge of Rajasthan- its Geography, Economy and Culture:**

- 1. Current Affairs:-** Current events of State, National and International importance, National & International agencies and their activities. Games & Sports at State, National and International levels.
- 2. History & Culture:-** Landmarks in the political and cultural history of India. Major monuments and literary works. Renaissance, struggle for freedom and national integration. History & Culture of Rajasthan with special reference to:-
  - (a) The medieval backgrounds.
  - (b) Socio-economic life and organization.
  - (c) Freedom movement and political awakening.
  - (d) Political integration.
  - (e) Dialects and literature.
  - (f) Music, dance & Theatre.
  - (g) Religious beliefs, cults, saints, poets, warrior- saints, Lok Devtas & Lok Deviyan.
  - (h) Handicrafts.
  - (i) Fairs and festivals, customs, dresses, ornaments with special reference to Folk & Tribal aspects thereof.
- 3. General Science:-** General science will cover general appreciation and understanding of science including matters of everyday observation and experience. Candidates are supposed to be familiar with matters such as electronic tele-communications, satellites and elements of computers (both Hard & Soft Wares), research labs including CSIR managed national labs and institutes. Environment & pollution etc.
- 4. Economic Developments with special reference to Rajasthan:-** Food and commercial crops of Rajasthan, Agriculture based industries, Major irrigation and River valley projects, Projects for the development of the desert and wastelands. Indira Gandhi Canal Project, growth and location of industries, Industrial raw materials. Mineral based industries, small scale and cottage industries, export items Rajasthani handicrafts, Tribes and their economy. Cooperative movement. Tourism development in Rajasthan, Various five years Plans: objectives and progress. Major economic problems of Rajasthan and obstacles for economic development. Current

budget of Rajasthan and Central Government. Economic reforms in India and their impact on commercial banks and other financial institution in Rajasthan.

**5. Geography and Natural Resources:-**

- (I) Broad- physical features of the world important places, rivers, mountains, continents, oceans.
- (II) Ecology and wild- life of India.
- (III) Rajasthan's Physiography: Climate, vegetation and soil regions. Broad physical divisions of Rajasthan. Human resources: problem of population, unemployment, poverty, drought, famine and desertification in Rajasthan. Natural resources of Rajasthan. Mines and Minerals, forests, land water. Animal resources. Wild- life and conservation. Energy problems and conventional and non-conventional sources of energy.

**6. Various schemes running in Urban Areas of Rajasthan:-**

- (I) Indira Rasoi Yojana
- (II) Swachh Bharat Mission (Urban)
- (III) Pradhanmantri aawas Yojana (Urban)
- (IV) Indira Gandhi Rojgar Guarantee Yojana (Urban)
- (V) Amrut Mission.
- (VI) Hriday Yojana
- (VII) National Urban Livelihood Mission (NULM)
- (VIII) Indira Gandhi Credit Card Yojana

## Part B

### CIVIL ENGINEERING

#### **A. ENGINEERING MATERIAL & CONSTRUCTION TECHNOLOGY:-**

Selection of site for the construction of various types of building: Planning and orientation of building. Bonds in masonry. Damp proof course. Scaffolding, underpinning and ranking floors, staircases, roofs, doors and windows. Requirements of fire protection. Ventilation and air conditioning and acoustics. Building and highway materials and there is codal provisions. Stones, bricks, timber, lime, cement, mortar, plain and reinforced cement concrete, bitumen, asphalt.

#### **B. SURVEYING:-**

Generally adopted scales, chain and compass surveying; Leveling; temporary and permanent adjustments of levels and theodolite. Use of Theodolite, tacheometry, Trigonometrical and Triangulation survey. Traversing and traverse adjustment, contours and contouring, simple circular compound and transition curves and their setting out, Theory of Errors and Survey Adjustment. Computations of areas and volumes.

#### **C. SOIL/GEO TECHNICAL ENGINEERING:-**

Classification of soil as per I.S. code, Field identification test for soils; water content, specific gravity, voids, ratio, porosity, degree saturation; unit weight, density index etc; and their inter-relationship, determination of various properties of soils as noted above as well as grain size distribution, consistency limits etc.

Soil permeability and its determination in the laboratory and field; Darcy's Law, Flow nets, its characteristics and uses.

Compaction and consolidation of soil. Quality control, Soil stabilization methods. Boussinesq's methods. Newmark's chart and its uses.

Shear strength parameters and their determination with Bearing capacity, local and general shear failures, design criteria for shallow foundation, Plate load Test and Standard Penetration Test. Earth pressures on retaining wall. Stability of simple slopes. Significant depth of exploration, design features of undisturbed sampler.

#### **D. STRUCTURAL MECHANICS:-**

Stress and strains, elastic constants, factor of safety, relation among elastic constants. Bending moments and shear force diagrams for cantilever, simply supported and overhanging, fixed and continuous beams subject to static loads:- concentrated, uniformly distributed and uniformly varying. Theory of Simple Bending. Shear stress, Influence lines.

Deflection of cantilever, simply supported fixed and continuous beams. Determinate and Indeterminate structures and frames pin jointed, Plane and space frames.

#### **E. STEEL STRUCTURES:-**

Design of ordinary and plate girder beams, roof trusses with welded joints, axially and eccentrically loaded columns, Grillage, Gusseted and slab base foundations. Provisions of IS : 800 and 875. Economic span of bridges.

#### **F. REINFORCED CONCRETE STRUCTURES:-**

Provisions of latest IS : 456 design of beams singly and doubly reinforced, design of shear reinforcement. Design of slabs spanning in two directions and T-beam slabs. Design of column axially and uniaxially eccentrically loaded. Design of isolated and combined column footings, Design of simple RCC cantilever and counterform retaining walls. Reinforcement in overhead and underground water tanks.

#### **G. FLUID MECHANICS INCLUDING HYDROLOGY AND IRRIGATION:-**

Hydraulic pressure at a point and its measurement. Total pressure and centre of pressure on plane and curved immersed surfaces, Buoyancy. Conditions of equilibrium of floating bodies; fluid flow conditions. Bernoulli's, Navier-Stokes, Reynolds's equations, flow through orifices venturimeter, notches and weirs, flow through pipes and open channels, Gradually and rapidly varied flow, Dimensional analysis, Momentum and angular momentum principles as applied to fluid in a control volume, applications of jets, Viscous flow, concept of drag, flow through pipes.

Engineering hydrology; Hydrology of floods and drought reservoirs and dams; overflow structures, ground water hydrology, irrigations: canals, Kennedy's Lacey's theories, Khosla's theories for design of hydraulic structures. Ground water and well irrigation, water logging.

#### **H. PUBLIC HEALTH ENGINEERING:-**

Per capita requirement of water for urban and rural areas, Forecast of population. Sources of water supply, standards of purity of public water supplies with various methods of purification; House drainage system. Distribution network with all the ancillaries: system of drainage. Layout of sewerage systems. Primary, Secondary treatments, trickling filters, lagoons and other treatment units and their design criteria. Flushing of sewers; sewage treatment; rural water supply and sanitation.

#### **I. HIGHWAY AND BRIDGES:-**

Principles of highway planning; classification of road land width, building line, center line, formation width, terrain classification pavement width, camber, longitudinal gradient sight distance, horizontal curve, super elevation, vertical curve, lateral and vertical clearances.

Flexible pavements; sub-base course and shoulder stone/ Kankar brick soling, WBM courses, shoulders. Granular sub-base, stabilized soil roads cement/ lime stabilized sub base, sand bitumen base course, crushed cement concrete base/ sub-base course.

Prime and tack coats, surface dressing, open graded premix carpet, semi dense carpet, build-up spray grout base course, bituminous base binder course. Asphaltic concrete, seal coats, mixed seal surfacing. Penetration macadam base/ binder course, full and semi groups.

Traffic Engineering: traffic characteristics, vehicular characteristics, volume, speed and delay studies origin and destination study, traffic flow characteristics, traffic capacity and parking studies, traffic regulation, traffic control devices, intersection control.

Alignment: traffic engineering, pavement design, paving materials and highway construction and maintenance of different types of roads. Need for highway drainage and arboriculture, types of bridges: choice of type of bridge, economical considerations of fixing spans culverts.

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—: परीक्षा योजना एवं पाठ्यक्रम :—

प्रतियोगी परीक्षा में नीचे विनिर्दिष्ट विषय पर एक प्रश्न-पत्र होगा जो कि वस्तुनिष्ठ प्रकार का होगा और अधिकतम 120 अंको का होगा। प्रश्नपत्र का स्तरमान स्नातक स्तर का होगा।

प्रश्न-पत्र	अंक	अधिकतम अंक	समय
भाग-अ:- सामान्य ज्ञान और सामान्य विज्ञान (राजस्थान का इतिहास, कला एवं संस्कृति, परम्पराएँ, विरासत एवं राजस्थान का भूगोल, तथा दैनिक विज्ञान)	40	120	2 घण्टे
भाग-ब:- सिविल अभियांत्रिकी (डिग्री)	80		

नोट:-

1. प्रश्न पत्र में बहुविकल्पीय प्रकार के 120 प्रश्न होंगे व सभी प्रश्न समान अंक के होंगे।
2. मूल्यांकन में ऋणात्मक अंकन किया जाएगा, जिसमें प्रत्येक गलत उत्तर के लिए 1/3 (एक तिहाई) अंक काटे जाएंगे।

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