

**FURTHER DETAILS REGARDING MAIN TOPICS OF
PROGRAMME NO. 05/2016 (Item No. 19, 20 & 21)**

ASSISTANT ENGINEER (CIVIL)

**KERALA STATE HOUSING BOARD/ KERALA STATE
ROAD TRANSPORT CORPORATION**

ASSISTANT ENGINEER (CIVIL)

**KERALA SMALL SCALE INDUSTRIES DEVELOPMENT
CORPORATION LIMITED (SIDCO)
(SR FOR ST ONLY)**

&

ASSISTANT ENGINEER (HYDROLOGY)

GROUND WATER

(CATEGORY Nos. 66/2015, 201/2015 & 209/2015)

PART 1a: STRUCTURAL ENGINEERING

Static friction, mass moment of inertia, collision of elastic bodies, conservation of energy and momentum, simple harmonic motion, elastic constants. Rotational motion. Bending moment and shear force in statically determinate beams. Simple stress and strain relationship: Stress and strain in two dimensions, principal stresses, Mohr's circle. Strain energy, torsion and axial stress, close coiled helical springs, columns and struts, Euler and Rankine loads, deflections, arches, influence lines. Simple bending theory, flexural and shear stresses, unsymmetrical bending, shear centre. Cylinders, thin walled pressure vessels, uniform torsion, buckling of column, combined and direct bending stresses. Flitched beams, slope deflection, trusses, concrete structures, balanced and unbalanced reinforcement, prestressed concrete, steel structures, rivets and joints.

PART 1b: GEOTECHNICAL ENGINEERING

Origin of soils, soil classification, three-phase system, fundamental definitions, relationship and interrelationships. Seepage forces, critical hydraulic gradient, permeability and compressibility of soils. Effective stress principle, liquefaction of soil, consolidation, compaction, shear strength. Mohr- Coulomb theory, active and passive earth pressures, settlement components.

PART 1c: FOUNDATION ENGINEERING

Sub-surface investigations- scope, drilling bore holes, sampling, penetration test, pile load test and plate load test. Earth pressure theories, effect of water table, layered soils. Stability of slopes-infinite slopes, finite slopes. Foundation types-foundation design requirements. Contact pressure distribution of ultimate bearing capacity of Terzaghi, design aspects of footings and rails. Shallow foundations-bearing capacity, effect of

shape, water table and other factors, stress distribution, settlement analysis in sands & clays. Deep foundations pile types, dynamic & static formulae, load capacity of piles in sands & clays, bearing capacity of piles and pile groups, negative skin friction. Under-reamed piles, well foundation, machine foundation, modes of vibration, natural frequency, vibration isolation.

PART 1d: FLUID MECHANICS AND IRRIGATION ENGINEERING

Properties of fluids, principle of conservation of mass, momentum, energy and corresponding equations. Buoyancy, stability of floating and submerged bodies, streamlines, velocity potential and stream function. Applications of momentum and Bernoulli's equation, laminar and turbulent flow through pipes, friction factor, pipe networks. Energy loss, critical depth in open channel flow, hydraulic jump and its applications, flow net, equation of continuity. Concept of boundary layer and its growth, drag and lift on bodies. Uniform flow, critical flow and gradually varied flow in channels, specific energy concept, hydraulic jump. Orifices and mouthpieces, notches and weirs. Dimensional analysis and hydraulic modeling, undistorted and distorted models. Hydrograph, unit hydrograph, specific yield, aquifers, storage capacity of reservoirs, reservoir losses, duty and delta, kharif and rabi crops, most efficient section of channels, types of dams, spillway, canal lining, hydraulic structures.

PART 1e : ENVIRONMENTAL ENGINEERING

Quality standards, basic unit processes and operations for water treatment. Drinking water standards, water requirements, basic unit operations and unit processes for surface water treatment, distribution of water. Sewage and sewerage treatment, quantity and characteristics of wastewater. Primary, secondary and tertiary treatment of wastewater, sludge disposal, effluent discharge standards. Domestic wastewater treatment, quantity of characteristics of domestic wastewater, primary and secondary treatment. Unit operations and unit processes of domestic wastewater, sludge disposal. Principles of coagulation, flocculation and sedimentation, distribution systems, sewerage systems, sewage treatment, sanitation, filtration, B.O.D, C.O.D., DO, self purification of streams.

PART 1f: TRANSPORTATION ENGINEERING

Geometric design of highways, classification of roads, transition curves, super elevation, testing and specifications of paving materials, design of flexible and rigid pavements. Railways, permanent way, ballast, sleeper, fastenings, points and crossings, different types of turn-outs, cross-over. Traffic characteristics, theory of traffic flow, intersection design, traffic signs and signal design, highway capacity. Signs, signals and markings.

PART 1g SURVEYING

Importance of surveying, principles and classifications, mapping concepts, coordinate system, map projections, measurements of distance and directions. Chain surveying, theodolite traversing, tacheometry. Plane table surveying, two-point problem, three-point problem. Compass surveying, bearing. Errors and adjustments, horizontal and vertical curves. Astronomical surveying, aerial photogrammetry, hydrographic surveying. Leveling, refraction and curvature corrections.

PART II: GENERAL KNOWLEDGE, CURRENT AFFAIRS & RENAISSANCE IN KERALA

Salient Features of Indian Constitution

Salient features of the Constitution - Preamble- Its significance and its place in the interpretation of the Constitution.

Fundamental Rights - Directive Principles of State Policy - Relation between Fundamental Rights and Directive Principles - Fundamental Duties.

Executive - Legislature - Judiciary - Both at Union and State Level. - Other Constitutional Authorities.

Centre-State Relations - Legislative - Administrative and Financial.

Services under the Union and the States.

Emergency Provisions.

Amendment Provisions of the Constitution.

Social Welfare Legislations and Programmes

Social Service Legislations like Right to Information Act, Prevention of atrocities against Women & Children, Food Security Act, Environmental Acts etc. and Social Welfare Programmes like Employment Guarantee Programme, Organ and Blood Donation etc.

RENAISSANCE IN KERALA

Towards A New Society

Introduction to English education - various missionary organisations and their functioning- founding of educational institutions, factories, printing press etc.

Efforts To Reform The Society

(A) Socio-Religious reform Movements

SNDP Yogam, Nair Service Society, Yogakshema Sabha, Sadhu Jana Paripalana Sangham, Vaala Samudaya Parishkarani Sabha, Samathwa Samajam, Islam Dharma Paripalana Sangham, Prathyaksha Raksha Daiva Sabha, Sahodara Prasthanam etc.

(B) Struggles and Social Revolts

Upper cloth revolts. Channar agitation, Vaikom Sathyagraha, Guruvayoor Sathyagraha, Paliyam Sathyagraha. Kuttankulam Sathyagraha, Temple Entry Proclamation, Temple Entry Act. Malyalee Memorial, Ezhava Memorial etc.

Malabar riots, Civil Disobedience Movement, Abstention movement etc.

Role Of Press In Renaissance

Malayalee, Swadeshabhimani, Vivekodayam, Mithavadi, Swaraj, Malayala Manorama, Bhashaposhini, Mathnubhoomi, Kerala Kaumudi, Samadarsi, Kesari, Al-Ameen, Prabhatham, Yukthivadi, etc

Awakening Through Literature

Novel, Drama, Poetry, *Purogamana Sahithya Prasthanam, Nataka Prashtanam*, Library movement etc

Women And Social Change

Parvathi Nenmenimangalam, Arya Pallam, A V Kuttimalu Amma, Lalitha Prabhu.Akkamma Cherian, Anna Chandi, Lalithambika Antharjanam and others

Leaders Of Renaissance

Thycaud Ayya Vaikundar, Sree Narayana Guru, Ayyan Kali.Chattampi Swamikal, Brahmananda Sivayogi, Vagbhadananda, Poikayil Yohannan(Kumara Guru) Dr Palpu, Palakkunnath Abraham Malpan, Mampuram Thangal, Sahodaran Ayyappan, Pandit K P Karuppan, Pampadi John Joseph, Mannathu Padmanabhan, V T Bhattathirippad, Vakkom Abdul Khadar Maulavi, Makthi Thangal, Blessed Elias Kuriakose Chaavra, Barrister G P Pillai, TK Madhavan, Moorkoth Kumaran, C. Krishnan, K P Kesava Menon, Dr.Ayyathan Gopalan, C V Kunjuraman, Kuroor Neelakantan Namboothiripad, Velukkutty Arayan, K P Vellon, P K Chathan Master, K Kelappan, P. Krishna Pillai, A K Gopalan, T R Krishnaswami Iyer, C Kesavan. Swami Ananda Theerthan , M C Joseph, Kuttippuzha Krishnapillai and others

Literary Figures

Kodungallur Kunhikkuttan Thampuram, KeralaVarma Valiyakoyi Thampuram, Kandathil Varghese Mappila. Kumaran Asan, Vallathol Narayana Menon, Ulloor S Parameswara Iyer, G Sankara Kurup, Changampuzha Krishna Pillai, Chandu Menon, Vaikom Muhammad Basheer. Kesav Dev, Thakazhi Sivasankara Pillai, Ponkunnam Varky, S K Pottakkad and others

GENERAL KNOWLEDGE AND CURRENT AFFAIRS

General Knowledge and Current Affairs

NOTE: - It may be noted that apart from the topics detailed above, questions from other topics prescribed for the educational qualification of the post may also appear in the question paper. There is no undertaking that all the topics above may be covered in the question paper.