

**FURTHER DETAILS REGARDING MAIN TOPICS OF  
PROGRAMME NO. 07/2015 (Item No. 31)**

**ASSISTANT PROJECT ENGINEER**

**KERALA LAND DEVELOPMENT CORPORATION LIMITED**

**(CATEGORY NO. 4/2014)**

**Module I**

Engineering Properties of soils; Fundamental definitions and relationships; Index properties of soils & soil classification by IS methods; Permeability and seepage analysis; Shear strength of soils, Mohr's Circle of stress; Active & passive earth pressures-Rankine's & Coulomb's, Stability of retaining walls; Stability Analysis of Slopes; Subsurface exploration methods, details, sampling.

**Module II**

Hydrological cycle; meteorological parameters and their measurement, analysis of precipitation data; Abstraction from precipitation ; runoff; Hydrograph analysis; unit hydrograph theory and application; stream flow measurement; flood routing, hydrological reservoir and channel routing

**Module III**

Measurement of distance and area; chain surveying, methods of traversing, traverse computations; measurement of angles and bearings, plane table surveying; types of levelling; contouring; instruments for surveying and levelling; computation of areas & volumes (earth work).

**Module IV**

Hydraulic Machines - Impulse momentum principle, Turbines-classification and comparison of velocity triangles for Pelton wheel and reaction turbines (Francis and Kaplan), work done and efficiency, specific speed, draft tube- different types, cavitation in turbines. Pumps- classification of pumps - Centrifugal & Reciprocating pumps- types, work done, efficiency, minimum. Pump selection and installation.

**Module V**

Lacey's theory & Kennedy's theory for irrigation channel design, comparison, defects; Cross section, balancing depth, spoil bank, land width, back berm,

counter berm, maintenance of irrigation channel & service roads, canal breaches, measurement of discharge of canal; Water logging & canal lining; terraces and bunds; vegetative waterways; gully control structures, drop, drop inlet and chute spillways; earthen dams; water harvesting structures, farm ponds, watershed management.

## **Module VI**

Soil-water-plant relationship, water requirement of crops; consumptive use and evapo-transpiration; irrigation scheduling; irrigation efficiencies; measurement of soil moisture, irrigation water and infiltration; surface, sprinkler and drip methods of irrigation; design and evaluation of irrigation methods. Engineering and agronomical methods of soil conservation

## **Module VII**

Drainage coefficient; planning, design and layout of surface and sub-surface drainage systems; leaching requirement and salinity control; irrigation and drainage water quality. Groundwater occurrence confined and unconfined aquifers, evaluation of aquifer properties; well hydraulics; groundwater recharge.

## **Module VIII**

Thermodynamic principles of I.C. engines; I.C. engine cycles; engine components; fuels and combustion; lubricants and their properties; I.C. engine systems – fuel, cooling, lubrication, ignition, electrical, intake and exhaust; selection, operation, maintenance and repair of I.C. engines; power efficiencies and measurement; calculation of power, torque, fuel consumption, heat load and power losses.

## **Module IX**

General Knowledge, Current Affairs & Renaissance in Kerala

***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.***