

**FURTHER DETAILS REGARDING MAIN TOPICS OF
PROGRAMME No. 12/2017 (Item No. 12)**

ASSISTANT ENGINEER (SOIL CONSERVATION)

SOIL SURVEY AND SOIL CONSERVATION

(CATEGORY No.072/15)

1. 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. Kuttamkulam 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, AI-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 Cheriyan, 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

PART II

MODULE – I

Fluid Mechanics – Properties of fluids – Measurement of fluid pressure – Total pressure and centre of pressure on plane surfaces – Buoyancy – Metacentric height – Fundamentals of fluid flow – Types of fluid flow -Continuity equation – Flow nets and its applications – Bernoulli's equation – Venturi meter, orifice meter,Pitot Tube -Flow through orifices and mouth pieces – Flow over notches and weirs – Flow through pipes – Head loss in pipes due to friction – Major and minor losses in pipes – Hydraulic grade line energy grade line – Flow in open channels - Most economical section of different forms of channels – Critical depth of channel – Hydrology – Hydrological cycle – Measurement of rainfall – Runoff estimation – Unit hydrograph theory and application – stream flow measurement – Flood routing – soil and water erosion – Mechanics of soil erosion – Factors affecting soil erosion – measures to control erosion – Earthen dams – rainwater harvesting structures – check dams - Watershed management.

MODULE -II

Basic soil properties and their inter-relationship - Index properties of soils – Particle size distribution characteristics of soils by sieve analysis and hydrometer analysis – Atterberg limits – Classification of a soil as per Indian Standards using Plasticity chart – Engineering properties of soils – Permeability- Methods of laboratory determination – Permeability of layered soil deposits – Effective stress principle – Shear strength of soils – Mohr's circle of stress – Laboratory determination of shear parameters of soils by direct shear test, unconfined compression test, triaxial test and vane shear test – UU, CU and CD tests – Consolidation of soils – Determination of magnitude of consolidation settlement – Determination of time rate of consolidation settlement– Compaction of soils – Procedure and specifications of Indian Standard Light and Heavy compaction tests – Field compaction control -

MODULE -III

Soil exploration – Various stages in planning an exploration program – Guidelines in fixing spacing and depth of bore holes – Different methods of Boring – Standard Penetration test and static cone penetration test on soils - Geophysical Methods – Seismic refraction and electrical resistivity methods – Soil sampling – Factors affecting sample disturbance and methods to ensure obtaining of good quality samples – Bearing capacity of soils – Terzaghi's method for determination of safe bearing capacity – Effect of water table on bearing capacity – Settlement of soils – Computation of elastic settlement – Concept of active and passive states – Determination of total active and passive earth pressures – Effect of water table, surcharge and layering on active and passive earth pressures – Stability of slopes – Friction circle method – Use of stability charts for slope stability analysis under various field situations – Soil improvement methods – Principle of preloading with drains – concept of reinforced earth – Stress distribution in soils – Boussinesq's theory – Equivalent point load method – Vertical stress in soils due to loaded areas of different shapes.

MODULE -IV

Surveying and levelling - Measurement of distance and area – Chain surveying- Theory of errors – Types – Weighting of observations – Most probable value – Methods of traversing – Checks in closed traverse – Traverse computations – Balancing the traverse – Plane table surveying – Theodolite surveying – Computation of areas and volumes – Electromagnetic distance measurement – Principles – Types of instruments – Distomat – Total Station – Parts of a Total Station – Principles and field procedures – Errors in Total Station Survey – Good practices in using Total Station – Geographic Information System – Components of GIS – GIS Data, Database Management Systems.

Module V -

Water requirement of crops; consumptive use and evapotranspiration; measurement of infiltration, soil moisture and irrigation water, Irrigation Water

Conveyance and application Methods: Design of irrigation channels and underground pipelines; irrigation scheduling surface , sprinkler and micro irrigation methods, design and evaluation of irrigation methods; irrigation efficiencies. Agricultural Drainage: Drainage coefficient ;planning, design and layout of surface and sub-surface drainage systems;leaching requirement and salinity control; irrigation and drainage water quality and reuse. Wells and Pumps: Types of wells, steady flow through wells; classification of pumps; pump characteristics;pump selection and installation.

Module VI

Design and selection of machine elements – gears, pulleys, chains and sprockets and belts; overload safety devices used in farm machinery; measurement of force, torque, speed, displacement and acceleration on machine elements. Farm Machinery: Soil tillage;forces acting on a tillage tool; hitch systems and hitching of tillage implements; functional requirements, principles of working, construction and operation of manual, animal and power operated equipment for tillage, sowing , planting, inter-cultivation, mowing, testing of agricultural machinery and equipment; calculation of performance parameters – field capacity, efficiency, application rate and losses;cost analysis of implements and tractors.

Module VII

Sources of power on the farm – human, animal, mechanical, electrical , wind , Solar and biomass; bio-fuels. Farm Power: 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 -VIII

Tractors and Power tillers:Type, selection, maintenance and repair of tractors and power tillers; tractor clutches and brakes; power transmission systems – gear trains, differential, final drives and power take-off; mechanics of tractor chassis; traction theory; three point hitches-free link and restrained link operations; mechanical steering and hydraulic control systems used in tractors; tractor tests and performance. Human engineering and safety in design of tractor and other soil conservation implements.

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.