FURTHER DETAILS REGARDING MAIN TOPICS OF PROGRAMME NO. 01/2021 (Item Nos. 33, 34, 35, 36, 37, 38, 39, 40 & 41)

AGRICULTURAL OFFICER/SOIL CONSERVATION OFFICER/ SOIL SURVEY OFFICER

AGRICULTURE DEVELOPMENT AND FARMER'S WELFARE DEPARTMENT/SOIL SURVEY AND SOIL CONSERVATION

(CATEGORY Nos. 163/2019, 307/2019, 353/2019, 354/2019, 211/2019, 236/2019, 392/2019, 393/2019, 398/2019)

PART I - HORTICULTURE

MODULE 1

Horticulture – definition – area, production, productivity of horticultural crops in India and Kerala – branches of horticulture – major fruit crops (Pomology) – importance, nutritional value – commercially cultivated varieties – improved propagation methods – methods of layout of orchard – planting systems, high density planting – factors affecting fruit production – training, pruning, top working - cultural operations – plant protection – harvesting, storage, marketing. Major plantation crops of Kerala – commercially cultivated varieties – improved propagation methods – factors affecting production – training, pruning, top working – methods of layout of plantation – planting systems, high density planting – cultural operations – plant protection – harvesting, storage, processing and value addition – marketing.

MODULE 2

Vegetables (Olericulture) – importance, nutritional value – factors affecting vegetable production – classification of vegetables – types of vegetable growing – summer vegetables, cool season vegetables – cultivated varieties – cultural practices – protected cultivation – plant protection – harvesting, storage, processing and value addition – marketing. Ornamental and flowering plants (Floriculture) – gardening and landscaping – cultivation of commercial ornamental and flower crops – post-harvest handling – principles and methods of extension of shelf life – methods of extraction of floral concrete packing, storage, marketing. Importance and scope of gardening and landscaping – styles of garden – garden designs – garden plants and other components for landscaping – special types of garden.

PART II - PLANT BREEDING AND GENETICS

MODULE 3

Germplasm – Methods of conservation and utilization in crop improvement. Induction of variability – Hybridisation, Mutation and Polyploidy and its utilization in crop improvement. Exploitation of heterosis in crop improvement – coconut, tapioca, rice, maize and vegetable crops. Improved varieties of crops – coconut, rice pulses and oil seeds. Production of quality seedlings in coconut.

MODULE 4

Seed Act 1966 – seed certification agencies, procedure, field inspection, seed testing, seed certification standards and classes of seed. Seed Bill 2004. Biological Diversity Act 2002. Convention on Biological Diversity, National Biodiversity Board. Intellectual Property Rights – Protection of Plant Varieties and Farmers Act (PPVFRA) and Geographical Indications.

PART III - PLANT PROTECTION

MODULE 5

Abundance and success of insects – Beneficial, productive and harmful insects – categories of pests of agriculture – Tools of integrated pest management (IPM) – host plant resistance, cultural, mechanical, physical, legislative, biological (macrobial and microbial control), chemical (synthetic, new molecules with novel mode of action) and botanical pesticides – Use of repellants, antifeedants, pheromones, chitin synthesis inhibitors, irradication (genetic control) and biotechnology (transgenic plants) in pest management, plant protection equipment – Bionomics, damage caused and management practices of pests of coconut, arecanut, cashew, mango, banana, other fruits, vegetables, tubers, pulses, tea, coffee, spices (pepper, cardamom, ginger), ornamentals and medicinal plants – pests of stored products – their preventive and curative management. Bionomics, damage caused and management – of non insect pests of agriculture – nematodes, mites, rodnuts, birds, molluscs (snail) etc.

MODULE 6

Important plant pathogens – fungi, bacteria, phytoplasma, spiroplasma, viruses – algae, protozoa and phanerogamic parasites, phenomenon of infection and pathogenesis. Principles of crop diseases management – plant quarantine – cultural control – biological control (biocontrol agents, PGPR), physical methods (soil solarisation, heat treatment), chemical control – fungicides – inorganic, organic, systemic, antibiotics – plant diseases resistance. Biotechnology in plant disease management – integrated plant disease management. Economic importance, symptoms, cause, epidemiology, disease cycle and integrated management of disease or rice, wheat, sugarcane, groundnut, pulses, vegetables, tubers, citrus, mango, banana, grapevine, pineapple, papaya, guava, sapota, cashew, apple, coconut, arecanut, cocoa, black pepper, ginger, cardamom, tree spices, oil palm, betelvine, coffee, tea, rubber and ornamentals.

PART IV - AGRONOMY

MODULE 7

Importance of agriculture in National Economy – basic principles of crop production – National and International research institutes – classification of crops – tillage – tilth – soil fertility and productivity – water resources and irrigation development – water and irrigation requirement of crops – scheduling of irrigation for crops – methods of irrigation – measurement of irrigation water – application, distribution and use efficiencies – irrigation water quality and its management – water management in major field crops (rice, sugarcane, banana, cowpea, sesamum, groundnut) – soil erosion – water harvesting – watershed – types – characteristics and management – agricultural drainage. Weeds – definition – characteristics – classification – crop – weed competition – allelopathy – weed control methods – integrated weed management – classification, formulation and selectivity of herbicides – herbicide application methods and equipments – weed management in field crops, viz, rice, banana, pineapple, vegetables and sugarcane.

MODULE 8

Economic importance – soil and climatic requirements – area and production – varieties – seed rate – spacing – methods of sowing/planting – manurial schedule, cultural practices and yield of major field crops of Kerala, viz, rice, tapioca, sugarcane, pulses, groundnut, sesamum and fodder crops, viz, guinea and hybrid napier. Crop stand establishment and planting geometry and their effect on crop growth and yield – cropping systems – terminology – plant interactions in multiple cropping systems – criteria for assessing yield advantage – major cropping systems of Kerala – (rice based – coconut based – cassava based – homestead farming) – organic farming – precision farming – Inegrated farming system – sustainable agriculture – LEIA – HEIA – LEISA – sustainable technologies for crop production.

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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.