SYLLABUS FOR THE POST OF JUNIOR ENGINEER (HORTICULTUTRE)

Section-A **70 Marks**

Domain Knowledge

Unit A Watershed Planning and Management - introduction and characteristics. Watershed development - problems and prospects, investigation, topographical survey, soil characteristics, vegetative cover, present land use practices and socio-economic factors. Watershed management - concept, objectives, factors affecting, watershed planning based on land capability classes, hydrologic data for watershed planning, watershed codification, delineation and prioritization of watersheds – sediment yield index. Water budgeting in a watershed. Management measures - rainwater conservation technologies - in-situ and ex-situ storage, water harvesting and recycling. Dry farming techniques - inter-terrace and inter-bund land management. Integrated watershed management - concept, components, arable lands - agriculture and horticulture, non-arable lands - forestry, fishery and animal husbandry. Effect of cropping systems, land management and cultural practices on watershed hydrology. Watershed programme - execution, follow-up practices, maintenance, monitoring and evaluation. Participatory watershed management - role of watershed associations, user groups and self-help groups. Planning and formulation of project proposal for watershed management programme including cost-benefit analysis.

Unit B Soil and Water Conservation Engineering - Introduction, causes and types - geological and accelerated erosion, agents, factors affecting and effects of erosion. Water erosion - Mechanics and forms - splash, sheet, rill, gully, ravine and stream bank erosion. Gullies - Classification, stages of development. Soil loss estimation – Universal soil loss equation (USLE) and modified USLE. Rainfall erosivity - estimation by KE>25 and EI30 methods. Soil erodibility - topography, crop management and conservation practice factors. Measurement of soil erosion - Runoff plots, soil samples. Water erosion control measures - agronomical measures - contour farming, strip cropping, conservation tillage and mulching. Engineering measures– Bunds and terraces. Bunds - contour and graded bunds - design and surplussing arrangements. Terraces - level and graded broad base terraces, bench terraces - planning, design and layout procedure, contour stonewall and trenching. Gully and ravine reclamation - principles of gully control - vegetative measures, temporary structures and diversion drains. Grassed waterways and design. Wind erosion- Factors affecting, mechanics, soil loss estimation and control measures - vegetative, mechanical measures, wind breaks and shelter belts and stabilization of sand dunes. Land capability classification. Rate of sedimentation, silt monitoring and storage loss in tanks.

Unit C Machines Drawing and Machines Design: Free Hand Sketching in Machine, Different types of keys, Shaft Couplings Muff Flanged/Flexible, Meaning of Design, Design of Shafts Under Torsion.

Unit D Electrical Machines And Power Utilisation: Electro-Motive Force, Transformer, Principles, Operation and Performance of DC, Starting of Shunt and Series Motor, Single Phase Induction Motor.

Unit E Farm Machinery And Equipment: Objectives of Farm Mechanization, Tillage, Heat And Mass Transfer And Refrigeration And Air Condition, Soil And Water Conservation Structure, Crop Processing And Drying And Structure, Theory of Machines, Crop Production Technology.

Section-B **30 Marks**

Unit A	General Knowledge – Current events, sports, history, geography, basic economics, general politics, Indian Constitution, Science environment, General awareness of Haryana etc
Unit B	Questions on Mathematics of matriculation standard- Number system, simplification, decimals, corrections, simple and compound interest, percentage, average, profit and loss, discount, mensuration, Time & work and time & distance etc.
Unit C	English, covering Grammar- Prepositions, adverbs, conjunction, direct/indirect speech, singular & plural, tenses, antonyms/synonyms etc
Unit D	Questions on Reasoning
Unit E	Questions on analytical Ability