

**DETAILED Syllabus for the post of Junior Instructor  
( Horticulture ) in Industrial Training Department - Cat No:  
641/2023**

**1. Fundamentals of Horticulture (10 Marks)**

**Agriculture** - Definition , Branches of Agriculture - Plant Science and Animal Science

Plant Science - Agronomy , Horticulture and Forestry

**Horticulture** - Branches - Fruits, Vegetables, Flowers , Plantation crops and Spices, Medicinal Plants

Importance and scope of Horticulture

Classification of Horticultural Plants, Fruits , Vegetables , Flowers

**Landscaping** - importance - Lawn - Methods of Lawn making, Lawn grasses

**Gardens** - Types , Garden designs, Indoor Gardens - Indoor Plants

New trends in gardening - Vertical Garden , Terrarium , Miniature Garden

**2. Agro Meteorology (08 Marks)**

**Agro Meteorology** - Definition, Weather and Climate in Agriculture , Weather elements - Rainfall , Temperature , Humidity , Wind speed and direction , Evaporation , Sunshine duration and Intensity.

**Meteorological Instruments** - Automatic Weather Stations (A W S)

**Agricultural seasons of Kerala** - Virippu, Mundakan and Puncheda

**Agricultural seasons of India** - Kharif, Rabi, and Zaid

**Monsoons of Kerala** - Southwest Monsoon and North East Monsoon

**Njattuvela** - Importance

**Special Weather phenomena's** - cyclones, flood , drought , heat and cold waves , hail storms,

**Weather forecasting** - Importance, types

**3. Soil and Nutrient Management (15 Marks)**

**Soil** - Definition, components

**Soil Profile** - Definition - Different horizons

**Properties of Soil** - Physical properties - Soil Structure - Types - Soil Texture - Textural classes, Soil Colour, , Soil Porosity, Soil Density, Bulk

Density, Particle Density, Soil Water – Water holding capacity, Field capacity (FC), Permanent Wilting Point (PWP)

**Chemical Properties of Soil**- Soil acidity – soil P<sup>H</sup> – P<sup>H</sup> Meter , P<sup>H</sup> Paper  
- Reclamation of Soil acidity – Liming materials

**Soil Alkalinity** – Reclamation – Gypsum, Sulphur

**Problem Soils** – Saline Soils , Non saline alkali soils, Saline alkali soils , Acid saline soil, Hydromorphic Saline soil

**Soils of Kerala** –

Soil Sampling – Soils Testing – Soil Test Labs – Soil Test Interpretation and Recommendation, Soil Health Card

**Erosion** – Soil Erosion – Types, Water Erosion – Types, Wind Erosion-Types

**Soil and Water Conservation Methods**- Agronomic measures – mulching, Contour farming, Alley Cropping , Multi tier cropping, Crop rotation, Cover cropping

**Vegetative measures** – Bio fencing / Vegetative fencing

**Engineering /Mechanical Measures** - Contour bunding, Contour Trenching, Bench terracing, Basin – Listing, Check dams, Gabions, Geo textile

**Water shed** – Definition, importance

**Water Harvesting structures** – Roof top water harvesting, Percolation Pits

**Plant nutrition** – Essential elements, Macro and Micro nutrients – functions , deficiency and toxicity symptoms

**Manures** – Bulky organic manures – Farmyard manures (FYM), Compost , Green manure.

**Concentrated Organic Manure** – Oil cakes , BoneMeal, Blood Meal, Fish Meal, Meat Meal.

**Compost** – Types of composting – Aerobic and Anaerobic composting

**Vermicomposting** – Vermiwash, **Coirpith composting** –

**Green Manuring** – Types. Examples

**Fertilizers** – classification – straight fertilizers – Example , Mixed fertilizers – Examples , Complex Fertilizers – Examples

**Bio Fertilizers** – Definition – Rhizobium, Azotobacter , Azospirillum, Blue Green Algae , Azolla, WAM, Phosphate , Solubilising bacteria and Fungi

**Fertilizer application methods** – Broadcasting , Band placement , Side dressing ,Basin application, Foliar application, Fertigation

Integrated Nutrient Management (INM)

**Fertilizer calculation** – Conversion of area – Cent – Acre – Hectare

#### **4. Tillage and Farm Machinery (10 Marks)**

**Tillage** – Definition , Tilt , Objectives of tillage – Types – Preparatory Cultivation and After Cultivation

**Preparatory Cultivation** – Primary, Secondary and Seed Bed

**Primary Tillage** – Types , Implements

**Secondary Tillage implement** – Cultivator , Harrows , Plank

**Modern concepts of tillage** – Zero Tillage , Minimum Tillage

Farm Machineries- Power tiller , Tractor, Rotavator , Seed Drill, Cono weeder , Rice transplanter

**Harvesting** – combined harvester

**Plant protection equipments** – Sprayers –Hand Sprayer – Knapsac Sprayer , Rocker Sprayer – uses, parts and working

**Electrical devices** – Pump and motor

**Safety precautions while using sprayers**

#### **5. Irrigation and Drainage (10 Marks)**

**Irrigation** – Methods – Surface , Sub surface , Micro irrigation, special methods ( Drip, Sprinkler, Mist, Bubbler ) , Fertigation

**Losses of irrigation water** – methods to prevent

**Water lifting equipments** – Indigenous and power operated

**Quality of irrigation water** – Management

**Drainage** – Need , types and control techniques

#### **6. Plant Propagation Techniques (12 Marks)**

**Types of propagation** – Sexual Propagation – seed – definition , qualities of good seed , classes of seed , soiling methods ,seed bed preparation , hybrid seedling production – portray seedlings – seed testing – germination Methods-Germination percentage

**Asexul propagation** - cuttings - types - stem, leaf, root

**Layering** - Air layering , simple layering , compound layering , mound layering

**Grafting** - Side grafting , approach grafting , stone grafting , wedge or cleft grafting

**Budding** - "T" budding, Patch budding , chip budding

**Tissue culture** - Advantages , Examples

**Vegetable Grafting**

**Plant Hormones- Examples, Uses, Application methods**

## **7. Pest and Disease Management in Horticultural Crops** **(10 Marks)**

**Pest** - Definitions , Classes, Insect orders

**Diseases** - Pathogens and symptoms

**Weeds** - Uses , types , Examples

**Pest Control Methods** - Cultural, Mechanical , Physical , Chemical and Biological

**Pesticides** - Chemical, Bio Pesticides , **Bio Pharmacy**

**Plant protection chemicals** - formulations

**Bio Control agents** - VAM, Tichoderma , Pseudomonas

## **8. Crop Production Technology of Horticultural crops** **(15 Marks)**

### **1. FRUITS**

**Banana** - Scientific name - season , varieties , and preparation - spacing - selection of suckers , proportion for planting , manuring and fertilizer application, de suckering , Plant protection - Important pest - banana pseudostem weevil , banana rhizome weevil, diseases - Bunchitop , kokkan disease , sigatoka leaf spot

**Mango** - Scientific name, Varieties, hybrids , propagation , planting fertilizer application, pest - mango hopper , fruit fly , stem borer , diseases - powdery mildew

**Pineapple** - Scientific name , varieties, spacing , manures and fertilizers , application of flowering hormone , pest - mealy beg , scale insect , diseases - Heart rot , Leaf spot

## **2. VEGETABLES**

**Solanaceous Vegetables** – Brinjal, Tomato and Chilli ( Common Name , Scientific Name , Varieties, Seed rate, Spacing , Fertilizer recommendation , Important pests , Nature of damage , Control measures .

**Cucurbitaceous vegetables** – common name , Scientific name , varieties , seed rate and spacing , fertilizer recommendation , plant protection , important pest , diseases and management .

**Cool season vegetables** – Cabbage , Cauliflower , Carrot

Scientific name , varieties

**Amaranthus** – Scientific name – varieties

**Okra** – Common name , Scientific name , varieties , seed rate , pest , diseases

**Vegetable cowpea** – Scientific name , varieties , seed rate , pest , diseases

**Terrace farming , Kitchen garden**

### **Preservation of Fruits& Vegetables**

Preparation of Jam,Jelly,Squash and Pickle, Processing Instruments, Preservatives

## **3.FLOWERS**

**Rose** – uses , classes of rose ,varieties, propagation , spacing, planting, fertilizer application – pest and disease management – harvesting – post harvest handling

**Jasmine** – Scientific name –species and varieties – propagation – spacing , planting , fertilizer application , plant protection , harvesting , value addition

**Marigold**-uses, Types,propagation,manuring&Fertilizer application,special practices-pinching,disbudding,Harvesting,value addition

**Orchid** – use , classification – varieties , propagation , planting , potting media , manuring , fertilizer application , repotting , plant protection , harvesting , post harvest handling

**Anthurium** – varieties , propagation , potting media – planting , fertilizer application , plant protection , harvesting

## **4. PLANTATION CORPS ,SPICES and MEDICINAL PLANTS**

**Plantation Crops** -Coconut, Rubber ( Varieties , cultivation practices , plant protection **Spices** - Pepper , cardamom , Ginger , Turmeric(Varieties,Propagation,Plant Protection) **Medicinal Plants** - Adalodakam , Panikkerka, kattarvazha,Brahmi, kasturi manjal, Neela amari , Thulasi , Vetivar( Common Name , Parts used, Medicinal properties)

## **9.Maintenance of Farm Records ( 5 Marks)**

**Registers**-stock register,cultivation register

**Marketing**-Types,Trading,Licensing,Taxation,Exporting

## **10.Occupational Safety& Health (5 Marks)**

**Safe Use of Pesticides, Chemical Poisoning**-First Aid measures, Safety and Protective Devices

**Safe use of Agriculture Machineries'**, protective measures during operation of machinery

**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.**