

**Scheme and Syllabus for Preliminary Screening Test for recruitment to the post of Botanist in the Directorate of Cinchona & Other Medicinal Plants under the Department of Food Processing Industries & Horticulture, Govt. of W.B. against Commission's Advt. No. 19/2019.**

**Scheme of Examination:**

**Preliminary Screening Test** will be objective type (MCQ) in 4 different series, viz., A, B, C & D.

- Number of questions: 100, each carrying 1 mark.
- Full marks: 100.
- Duration: 1 hour 30 minutes.

**N.B.: There will be negative marking for wrong answers as per norms.**

**Syllabus of Examination:**

Marks will be allotted as: (i) Botany or Agriculture including Genetics

- (a) **Scope and importance of Medicinal and Aromatic Plants, horticultural crops and floriculture** – Area and Production – Imports and Exports – Agro Climatic Zones of India and West Bengal in relation to Horticultural, Floriculture and Medicinal and Aromatic Plants.
- (b) **Scope for Medicinal and Aromatic Plants, Floriculture and Horticulture Development in West Bengal (especially Hilly region):** Factors limiting Medicinal and Aromatic Plants, Floriculture and Horticultural crop production – Climate (Rainfall, Temperature, Light Humidity, Sunshine) – Soil (pH, EC, Soil Depth) – Crops suitable for different soils – water (Quality and quantity) – Drainage.
- (c) **Dry land/terrace horticulture and watershed management.**
- (d) **Planning:** Layout and Planning of orchards and Nurseries – fencing- wind breaks – spacing – systems of planting – cropping systems, Multitier cropping – cover crops – Intercrops – Mulching – weed control.
- (e) **Manures and Manuring:** Organic and inorganic manures – Bio fertilizers – Fertigation – Bio pesticides.
- (f) **Essential Elements** – Functions – Cultivation technique – Deficiency symptoms – Fertilizer schedule – Time and method of application. Physiological disorders – Control measures.
- (g) **Irrigation** – Water requirement of different crops – various irrigation methods including Drip, Sprinkler, Fogging, Misting and Water Stress – Mulching types.
- (h) **Training and Pruning** – Principles and Methods – Canopy Architecture – Planting systems and Planting densities.

- (i) **Flowering – Pollination** – Fruit set – Fruit drop – Causes and Prevention – Unfruitfulness associated with External and Internal factors.
- (j) **Maturity** – Harvesting – Pre and Post Harvest Handling – Processing and Preservation.
- (k) Role of plant growth regulators and their commercial applications in the Horticulture.
- (l) **Seed and Vegetative Propagation** – advantages and disadvantages – Seed Treatment – Important methods of Vegetative Propagation – Cutting – Layering – Incompatibility – Grafting – Budding – Rootstock – Scion – (Stock – scion relationship) – Specialized Parts of Propagation (bulbs, corms, tubers, offsets, runners etc.) – Micro propagation.
- (m) **Tropical, Subtropical, Temperate and Arid Zone Horticultural Crops-** Climate and Soil – propagation practices spacing and planting- varieties- Nutrient water and weed management – mulching- intercropping – use of growth regulators- yield-Economics- Integrated pest and disease management- Pre and Post harvest practices- Processing and Preservation- Marketing.
- (n) **Fruit Crops:** Kiwi, Peach, Pear Plum, Strawberry, Apple, Walnut, Avocado, Dragon fruits etc.
- (o) **Spice Crops:** Cardamom, Ginger, Turmeric, Saffron, Black Pepper, etc.
- (p) **Plantation Crops:** Cinchona, Tea, Coffee, Rubber etc.
- (q) **Vegetable Crops:** Tomato, Brinjal, Bhendi, Chilli, Cucumber, Gourds, Pumpkin, Peas, Beans, Potato, Tuber crops, Carrot, Radish, Cauliflower, Cabbage etc. Exotic vegetables- Broccoli, Brussels Sprouts, Asparagus, Celery, Spinach etc.
- (r) **Flower Crops:** Cymbidium and Tropical Orchids, Chrysanthemum, Marigold, Gerbera, Gladiolus, Anthurium, Carnation, Statice etc.
- (s) **Medicinal Plants:** Ipecac, Chirata, *taxus baccata*, Cinchona and other commercially important Medicinal plants like Aswagandha, *Sweritia Chirata*, *Rauwolfia Serpentine*, *Valeriana jatamansi*, *Ocimum sanctum*, *Artemisia annua*, *Gymnema Sylvestre*, *Catharanthus roseus*, *Piper longum*, *Withania Somnifera*, *Andrographis paniculata*, *Costus speciosus*, *Digitalis purpurea*, *Stevia* etc.
- (t) **Aromatic Plants:** Commercially important aromatic plants notified by Govt. of India like Lemongrass, Citronella, Patchouli, Vetiver, *Artemisia annua*, Geranium, Menta, *Ocimum Eucalyptus*, Sandalwood, Lavender etc.
- (u) **Ornamental Gardening:** Landscaping- design and principles- Types of gardens-Layout-garden components-flowering, foliage and Avenue trees-Arboretum-Shrubs-Creepers and climbers. Cacti and Succulents, Hedge and edge plants. Plants for rockery and water garden-Flowering annuals, Indoor plants, Garden ornaments-arches and pergolas. Lawn- grasses- Making and maintenance. Terrace gardening, topiary Bonsai preparation, flower arrangements, Urban and semi-urban Horticulture, Kitchen garden, aeroponics, hydroponics and Herbal garden.
- (v) **Social and Farm Forestry.**

### Special Topics:

- (1) **Research and Development oriented works.**

**(2) Organic farming:**

Definition of organic farming, scope of organic farming in Horticulture Crops, Certification procedure and inspection of organic production of Horticulture crops. Scientific use of microbial inoculants in Horticulture crops. Preparation and use of organic manures *viz.* Enriched compost, Vermi compost, Green manuring, Beejamrutha, Jeevamrutha, Panchagavya, Biodigester, Vermi wash, Cow urine, Neem cake, BD-500 etc. Use of Bio-fertilizers *viz.* Rhizobium, Azotobacter, Azospirillum, phosphate solubilizers, Azolla, plant growth promoting rhizobacteria, VAM in different Horticultural crops. Methods of application of bio-fertilizers. Use of microbial consortia in composting of Agri/Horticultural wastes and enrichment of compost. Microbial biocontrol agents *viz.* Pseudomonas, Bacillus, PGPR etc. Crops suitable for organic farming.

**(3) Precision farming:**

Definition and implementation in Horticultural crops.

**(4) Seed science and technology:**

Type of seeds, concept of seed quality and factors affecting it. Role and goal of seed technology. Generation system of seed multiplication, classes of seed. Different organization involve in seed production and certification. Principles of seed production, seed certification and processing. Seed testing method (Germination test, physical purity test, moisture test, TZ test etc) principles and methods of seeds storage, IPR and its utilization, PPVR and FR technique of seed production in important vegetable (Tomato, Brinjal, Onion, Cucurbits, Root vegetables etc.)

**(5) Soil science and agricultural chemistry:**

Importance of soil testing, soil sampling procedure for horticulture crops and interpretation, Plant nutrients-introduction, definition of nutrient, nutrients accumulation, nutrient uptake and nutrient removal, Stout criteria of essentiality. Classification of essential nutrient as primary, secondary and micro nutrient. Function and deficiency symptom of nutrient and remedial measure. Organic matter, importance of organic matter, humus, types of humus and importance of humus and organic matter. Fertilizers-definition, difference between organic manure and fertilizer. Classification of fertilizer. Problematic soil – causes and reclamation methods. Quality of irrigation water and management and integrated plant nutrient management.

(ii) G.K. and Current Affairs : [Madhyamik standard]

(iii) Arithmetic & Reasoning : [Madhyamik standard]

(iv) English : [ Madhyamik standard]

