

## RAJASTHAN PUBLIC SERVICE COMMISSION

### Syllabus for Screening test for the Post of **Agriculture Research Officer (Horticulture)** Agriculture Department

- 1. Fruit production:** Importance of fruit production and arid horticulture, commercial varieties of regional, national and international importance, recent trends in propagation, rootstock influence, planting systems, root zone and canopy management, nutrient and water management, role of bio-regulators, abiotic factors limiting fruit set and production, physiology of flowering, pollination, fruit set and development, physiological disorders-causes and their remedies, maturity indices, harvesting, grading, packing, storage and ripening techniques of:
  - A. Mango, Banana, Papaya, Sapota, Jack fruit, Coconut, Aonla, Pomegranate, Phalsa, Ber, Datepalm and other minor fruits viz. Lasoda, Mulberry, Fig and Tamarind.
  - B. Apple, Litchi, Strawberry, Walnuts, Grapes, Guava, Citrus, Custard apple and other minor fruits viz. Bael, Jamun, Ker and Pilu.
- 2. Vegetable Production:** Introduction (Importance and scope), botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, sowing/planting times and methods, seed rate and seed treatment, nutritional and irrigational requirements, intercultural operations, weed control, mulching, physiological disorders, harvesting, post harvest management, plant protection measures and economics of crop production of:
  - A. Tomato, Brinjal, Hot and sweet peppers, okra, cowpea, cluster bean, cucurbitaceous crops, colocasia and sweet potato and green leafy vegetables.
  - B. Cabbage, cauliflower, knol-khol, sprouting broccoli, carrot, radish, onion, garlic and peas.
- 3. Seed production:** Definition of seed; DUS test, scope of vegetable seed industry in India; genetical and agronomical principles of seed production; methods of seed production; use of growth regulators and chemicals in vegetable seed production; methods of hybrid seed production; categories of seed; maintenance of nucleus, foundation and certified seed; seed certification, seed standards; Physiological maturity, seed harvesting, extracting, curing, drying, grading, seed processing, seed coating and pelleting, packaging, storage of seeds; Agro techniques for seed production in solanaceous vegetables, cucurbits, leguminous vegetables, cole crops, bulb crops, leafy vegetable and okra.
- 4. Propagation and nursery management:** Cellular basis for propagation, sexual propagation, apomixes, polyembryony, chimeras, principal factors influencing seed germination of horticulture crops, dormancy, hormonal regulation of germination and plant growth; seed quality, treatment, packing, storage, certification; Asexual propagation-rooting of cuttings, physiological, anatomical

and bio chemical aspects of root induction in cuttings; Layering-principle and methods. Budding and grafting-selection of elite mother plants, methods, establishment of bud wood bank, stock, scion and inter stock relationship, Rejuvenation of old orchards through top working; Progeny orchard and scion bank, micro propagation-principles and concepts, Techniques- in vitro clonal propagation, direct organogenesis, embryogenesis, micro grafting, meristem culture, shoot tip grafting/micro grafting; Nursery-types, structures, components, planning and layout; Nursery management practices for healthy propagule production.

5. **Floriculture and ornamental gardening** : Importance and scope of floriculture in India; Varietal wealth and diversity, propagation - sexual and asexual propagation methods, nursery management, pro-tray nursery under shade nets, transplanting techniques, soil and climatic requirements, precision farming techniques, water and nutrient management, weed management, training and pruning, pinching and disbudding, special horticultural practices, use of growth regulators, physiological disorders and remedies, IPM and IDM, flower forcing and year round flowering, Harvest indices, harvesting techniques, post harvest handling and grading, pre-cooling, packing and storage, value addition, concrete and essential oil extraction of: cut/scented roses, cut/loose chrysanthemum, gerbera, gladioli, tuberose, carnation, dahlia, Jasmine, marigold, gaillardia, ixora, lilies, aster and cut foliage; Landscape gardening, styles of gardening, different features of garden, arboretum, shrubbery, fernery, palmatum, arches and pergolas, edges and hedges, climbers and creepers, cacti and succulents, herbs, annuals, flower borders and beds, ground covers, carpet beds, establishment and maintenance of lawn, Bio-aesthetic planning, theme parks and indoor gardening.
6. **Spice crops Production**: National and International importance of spice crops, climatic and soil requirement, commercial varieties, hybrids, sowing, planting time and methods, seed rate and seed treatment, nutritional and irrigation requirements, intercultural operations, weed control, mulching, physiological disorders, harvesting and post harvest management, plant protection measures, organic resource management, organic certification, quality control and protected cultivation of: Black pepper, clove, cinnamon, turmeric, ginger, garlic, coriander, fenugreek, cumin, fennel, ajowain, dill, celery and vanilla.
7. **Breeding of vegetable crops**: Origin, botany, taxonomy, cytogenetics, breeding objectives, breeding methods (introduction, selection, hybridization, mutation), varieties and varietal characterization, resistance breeding for biotic and abiotic stress, quality improvement, biotechnology and their use in breeding in vegetable crops of: Potato, Tomato, Brinjal, Hot pepper, Sweet Pepper, Okra, Peas and Beans, Gourds, Melons, Pumpkins, Cabbage, Cauliflower, carrot, radish and sweet potato.

8. **Post harvest technology of horticultural crops:** Maturity indices, harvesting practices for specific market requirements, influence of post harvest practices, enzymatic and textural changes, respiration, transpiration of fruits & vegetables; Physiology and biochemistry of fruit ripening factors leading to post harvest loss, pre-cooling, methods of storage-ventilated, refrigerated, MAS, CA storage, physical injuries and disorders, packing methods and transportation, principles and methods of preservation, food processing, canning, fruit juice beverages, pickles, jam, jellies, sauces and ketchup, candies, preserves, dried and dehydrated products and food safety standards.

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Pattern of question papers:

1. Objective type paper
2. Maximum marks : 100
3. Number of question : 100
4. Duration of paper : Two hours
5. All question carry equal marks
6. There will be negative marking.

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