# RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

# SYLLABUS FOR COMPETITIVE EXAMINATION FOR THE POST OF ASSISTANT PROFESSOR IN AGRICULTURE HORTICULTURE FOR COLLEGE EDUCATION DEPARTMENT

## **PAPER-I**

### 1. Fruit Production-

Importance, scope and constraints of horticulture with especial reference to Rajasthan. Climate change and fruit production, biodiversity and conservation of fruits, export-oriented fruit production and cropping system of fruit production. Overview of commercial varieties of regional, national and international importance, soil & climate, recent trends in propagation, rootstock influence, planting systems, root zone and canopy management, High Density and Meadow orcharding, Training & pruning, nutrient and water management, fertigation, role of bio-regulators, abiotic factors limiting, physiological disorders- cause sand their remedies, plant protection measures, maturity indices, harvesting, grading, packing, storage and ripening techniques of:-

- A. Mango, banana, papaya, sapota, jackfruit, aonla, pomegranate, phalsa, ber, datepalm and other minor fruits viz. lasoda, mulberry, fig, tamarind and karonda.
- B. Apple, plum, litchi, strawberry, grapes, guava, citrus, custard apple and other minor fruits viz. bael, jamun, ker, Pilu and khejri.

## 2. Propagation and Nursery Management-

Importance and scope of plant propagation and nursery management. Sexual propagation, cellular basis for propagation, apomixes, polyembryony, chimeras, principal factors influencing seed germination of horticultural crops, dormancy, hormonal regulation of germination and plant growth, seed quality, treatment, storage, certification. Asexual propagation- rooting of cuttings, physiological, anatomical and bio chemical aspects of root induction in cuttings, layering-its principles and methods. Budding and grafting-selection of elite mother plants, methods, establishment of bud wood bank, stock, scion and inter stock relationship. Role of PGRs in propagation. 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 and practices for healthy propagule production and recent trends in propagation.

## 3. Breeding and Physiology of Fruit Crops-

History, development and importance of fruit breeding. Genetics of diversity, distribution and domestication of fruit species. Problems in fruit breeding-Polyploidy, heterozygosity, polyembryony, parthenocarpy and seedlessness etc. Incompatibility and sterility system, Apomixis, Variability, germplasm and its selection. Breeding strategies- clonal selection, bud mutation and chimeras, mutagenesis and its application. Hybridization, resistance breeding for biotic and abiotic stresses. Role of genetic engineering and biotechnology in important fruit crops. Parameters of growth and development, morphogenesis, effect of light, temperature, photosynthesis & photoperiodism, vernalisation. Physiology of flowering, pollination, fruit set and development.

### 4. Post-Harvest Technology of Horticultural Crops -

Importance and scope of PHT & preservation. Maturity indices, harvesting, minimal processing, practices for specific market requirements, influence of post-harvest practices, enzymatic and non-enzymatic changes, respiration, transpiration of fruits & vegetables, physiology and biochemistry of fruit ripening factors leading to post-harvest losses, pre-cooling, methods of storage-ventilated, refrigerated, MA & CA storage, physical injuries and disorders, packaging 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. Nutritionally rich products, fermented fruits and beverages and processing of waste management. Recent trends in food preservation and value addition, food additives, ripening of fruits and vegetables. Food safety standards and food laws.

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#### **Note: - Pattern of Question Paper**

- 1. Objective type paper.
- 2. Maximum Marks: 75
- 3. Number of Ouestions: 150
- 4. Duration of Paper: Three Hours
- 5. All questions carry equal marks.
- 6. Medium of Competitive Exam: Bilingual in English & Hindi
- 7. There will be Negative Marking.