

RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

SYLLABUS FOR SCREENING TEST FOR THE POST OF AGRICULTURE RESEARCH OFFICER (ENTOMOLOGY) AGRICULTURE DEPARTMENT

PART-A

General Knowledge of Rajasthan

Unit-I

Historical Rajasthan: Pre and Proto-historical sites of Rajasthan. Important historical centers of early Christian Era. Prominent rulers of major Rajput dynasties of Rajasthan and their achievements & contributions – Guhilas- Sisodiyas, Chauhans, Rathores and Kachchawas.

Emergence of Modern Rajasthan: Agents of Social Awakening in Rajasthan during 19th and 20th Centuries. Political Awakening: role of newspapers and political institutions. Praja Mandal movement in various princely states in 20th century. Integration of Rajasthan.

Art of Rajasthan: Architectural tradition of Rajasthan- temples, forts and palaces from ancient to modern period; Various schools of paintings developed during medieval period; Classical Music and Classical Dance, Folk Music & Instruments; Folk Dances & Drama.

Language & Literature: Dialects of Rajasthani language, Literature of Rajasthani language and Folk literature.

Religious life: Religious communities, Saints and Sects in Rajasthan. Folk Deities of Rajasthan.

Social Life in Rajasthan: Fairs and festivals; Social customs and traditions; attires and ornaments.

Geography of Rajasthan:- Broad physical features- Mountains, Plateaus, Plains & Desert; Major Climatic types; Major rivers and lakes; Major forest types and distribution; Population growth, Density and Distribution; Desertification, Droughts & Floods; Environmental pollution and Ecological concerns. **– 30 Questions**

PART-B **(ENTOMOLOGY)**

Unit-1 Insect Morphology

Insect head, thorax, abdomen and their appendages. Wings, venation, modification and their function. Structure types and function of antennae.

Unit-2 Insect Anatomy & Physiology

Insect cuticle, digestive, respiratory, circulatory, excretory, reproductive, muscular and nervous systems; production and function of hormones and pheromones. Growth and metamorphosis.

Unit-3 Insect Taxonomy

Systematics – Phylogenetic evolutionary tree, importance, scope and applicability of insect systematics in other fields of Entomology. Levels of taxonomy, Linnaean hierarchy, old and new taxonomy. Classification of insects- Important characters of orders, suborders and super families - all families of economic importance: Hemiptera, Orthoptera, Isoptera, Thysanoptera, Neuroptera, Diptera, Hymenoptera, Lepidoptera and Coleoptera. Recent trends in insect taxonomy.

Unit-4 Insect Ecology

Introduction- Abundance and diversity of insects; habitat and niche; intra and interspecific interactions; natural and agro-ecosystems; flow of energy in ecosystem; trophic relations; host finding, feeding and reproductive, escape, defence, offence and predation; dispersal and migration; dormancy. Libig's law of Minimum, life table concept.

Unit-5 Insect Toxicology

Scope of insecticide toxicology; Factors affecting toxicity of insecticides; insecticide compatibility, selectivity and phytotoxicity. Pest resistance to insecticides; mechanisms and types of resistance; insecticide resistance management and pest resurgence. Insecticide residues, their significance and environmental implications. Insecticide Act, registration and quality control of insecticides.

Unit-6 Insecticides and their application

Introduction; nomenclature, classification on the basis of mode of entry, chemical nature, mode of action and toxicity, formulations, compatibility, physico-chemical properties, mode of action, residues, hazards and safety measures of organochlorines, organophosphates, carbamates, pyrethroids, tertiary amines, neonicotinoids, oxadiazines, phenyl pyrozoles, insect growth regulators, spinosyns, microbials, botanicals, new promising compounds etc ; structure and working of various types of hand and power operated equipments for insecticide application. Safe use of insecticides; diagnosis and treatment of insecticide poisoning. Insecticide metabolism and action.

Unit-7 Urban and Storage Entomology

Introduction; Identification, biology and control of different stored grain and grain product pests. Storage principles; types of storages; Factors affecting grain and other products in storages; stored product losses and their prevention. Storage structures, warehouse management. Management and safe use of pesticides including fumigants in stored commodities.

Scope and prospects of Urban Pest Management— Economic and public health importance of domestic pests- Habits, biology, damage and management of major domestic pests, viz., mosquitoes, houseflies, bed bugs, ants, termites, cockroaches, fleas, silverfish, head and body lice, carpet beetles, cloth moths, crickets, wasps. Pests of cattle, poultry, pet animals and their management. Insecticides for domestic use and their qualities— Appliances for domestic pest control. Termite proofing in buildings both under construction and existing.

Unit-8 Insect Pest Management

Definition of IPM- Concept and philosophy, ecological principles, economic decision level concept, and economic consideration. Tools of pest management and their integration: legislative, cultural, physical and mechanical methods; pest survey and surveillance, forecasting, types of surveys including remote sensing methods; political, social and legal implications of IPM.

Principles and scope of biological control; important groups of parasitoids, predators and pathogens; principles of classical biological control; introduction, augmentation and conservation. Role of insect pathogenic viruses, bacteria, fungi, nematodes, protozoa etc. and their mode of action. Use of semiochemicals.

Introduction, identification, distribution, host plants, biology, nature of damage and management of insect and mite pests of field crops, vegetables, orchards, Plantation crops, flowering and medicinal plants, other important vertebrate and invertebrate pests.

Unit-9 Beneficial insects

Introduction: insects of medicinal, food, aesthetic value; insect pollinators and environmental indicators; scavengers, entomophagous and weed-feeding insects; entomological industries: apiculture, sericulture and lac-culture.

Unit-10 Biotechnology in Pest Management

Role of biotechnology in pest management. Biological control and biotechnology -genetic improvement of natural enemies. Mass production techniques - in vitro production of entomopathogens in cell lines. Recombinant DNA technology and pest control - transgenic plants for pest resistance – genes of entomological importance and proteins. Case studies. Resistant management strategies in transgenic crops- regulation –ethics.

-120 Questions

Pattern of Question Papers:

1. Objective Type Paper
2. Maximum Marks: 150
3. Number of Questions: 150
4. Duration of Paper: 2:30 Hours
5. All Questions carry equal marks
6. Medium of Screening Test: Bilingual in English & Hindi
7. There will be **Negative Marking.**

(For every wrong answer, one-third of marks prescribed for that particular questions will be deducted).
