

# **RAJASTHAN PUBLIC SERVICE COMMISSION**

## **Syllabus for Screening test for the Post of**

### **Assistant Agriculture Research Officer (Entomology)**

#### **Agriculture Department**

##### **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)**

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

##### **Unit-3 (Insect Taxonomy)**

Systematics – Importance, scope and applicability of insect systematic in other fields of Entomology. Classification of insects- Important characters of orders, suborders and super families - all families of economic importance: Hemiptera, Orthoptera, Isoptera, Diptera, Hymenoptera, Lepidoptera and Coleoptera.

##### **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.

##### **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, microbials, botanicals, new promising compound etc ; structure and working of various types of hand and power operated equipment for insecticide application. Safe use of insecticides; diagnosis and treatment of insecticide poisoning.

### **Unit-7 (Urban and Storage Entomology)**

Introduction; Identification, biology and control of different stored 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 in stored commodities.

Scope and prospects of Urban Pest Management— Economic and public health importance of domestic pests- Habits, biology, damage and control 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. Termite proofing in buildings both under construction and existing.

### **Unit-8(Insect pest management)**

Definition of IPM-Concept and philosophy, ecological principles, economic threshold 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; importation, augmentation and conservation. Role of insect pathogenic nematodes, viruses, bacteria, fungi, protozoa etc. and their mode of action.

Introduction, identification, distribution, host plants, biology, damage and control of insect and mite pests of field crops, vegetables and orchards; 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 and proteins. Resistant management strategies in transgenic crops- regulation –ethics.

### **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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