

RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

SYLLABUS OF COMPETITIVE EXAMINATION FOR THE POST OF AGRICULTURE RESEARCH OFFICER (ENTOMOLOGY) AGRICULTURE DEPARTMENT

Part-A

- 40 Questions

General Knowledge of Rajasthan

Unit-I: History, Culture & Heritage of Rajasthan -

Pre & early history of Rajasthan. Age of Rajputs: Major dynasties of Rajasthan and the achievements of prominent rulers. Emergence of Modern Rajasthan: factors of socio-political awakening of 19th century; Peasants and tribal movements of 20th century; Political struggle of 20th century and the integration of Rajasthan.

Visual Art of Rajasthan - Architecture of forts and temples of Rajasthan; Sculpture traditions of Rajasthan and various schools of painting of Rajasthan.

Performing Arts of Rajasthan - Folk music and musical instruments of Rajasthan; folk dance and folk drama of Rajasthan.

Various religious cults, saints and folk deities of Rajasthan.

Various dialects and its distribution in Rajasthan; literature of Rajasthani language.

Unit-II: Geography, Natural Resource & Socio-Economic Development of Rajasthan -

Geography of Rajasthan: Broad physical features- Mountains, Plateaus, Plains & Desert; Major rivers and lakes; Climate and Agro-climatic regions; Major soil types and distribution; Major Forest types and distribution; Demographic characteristics; Desertification, Droughts & Floods, Deforestation, Environmental Pollution and Ecological Concerns.

Economy of Rajasthan: Major Minerals- Metallic & Non- Metallic; Power Resources- Renewable and Non-Renewable; Major agro based industries- Textile, Sugar, Paper & Vegetable oil; Poverty and Unemployment; Agro food parks.

Unit-III: Current Events and Issues of Rajasthan and India -

Important Persons, Places and Current events of the State. National and International events of importance. New Schemes & Initiatives taken recently for welfare & development in Rajasthan.

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 pyrololes, 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.

Scheme of the examination				
S. No.	Subject	No. of Questions	Total Marks	Examination Duration
Part-A	General Knowledge of Rajasthan	40	40	2.30 Hours
Part-B	Concerned Subject (as prescribed in qualification)	110	110	
	Total	150	150	

1. The competitive examination shall carry 150 marks and 150 questions of Multiple Choice Type questions.
 2. There shall be one paper. Duration of Paper will be Two hours and Thirty Minutes.
 Negative marking shall be applicable in the evaluation of answers. For every wrong answer one-third of the marks prescribed for that particular question shall be deducted.
 Explanation: - Wrong answer shall mean an incorrect answer or multiple answers.
उक्त पद हेतु आयोजित की जाने वाली परीक्षा के लिए ओ.एम.आर. उत्तरपत्रक में प्रश्नों के विकल्प भरने के संबंध में विशेष निर्देश:-

1. Each question has five options marked as 1, 2, 3, 4, 5. You have to darken only one circle (bubble) indicating the correct answer on the Answer Sheet using BLUE BALL POINT PEN.
2. It is mandatory to fill one option for each question.
3. If you are not attempting a question then you have to darken the circle '5'. If none of the five circles is darkened, one third (1/3) part of the marks of question shall be deducted.
4. After solving question paper, candidate must ascertain that he/she has darkened one of the circles (bubbles) for each of the questions. Extra time of 10 minutes beyond scheduled time, is provided for this.

A candidate who has not darkened any of the five circles in more than 10% questions shall be disqualified.