

RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

SYLLABUS FOR COMPETITIVE EXAMINATION FOR THE POST OF ASSISTANT PROFESSOR IN AGRICULTURE (ENTOMOLOGY) FOR COLLEGE EDUCATION DEPARTMENT

PAPER – I

Unit 1: Systematics-

History and development of Entomology, evolution of insects, position of insects in the animal world, insect dominance. Characteristics of phylum Arthropoda, structural features of important arthropod groups such as Trilobita, Chelicerata and Mandibulata, structural features of important classes of phylum Arthropoda viz. Arachnida, Crustacea, Chilopoda, Diplopoda and Hexapoda. Classification of insects upto order level, habits, habitats and distinguishing features of different order and important families of economic importance.

Unit 2: Morphology-

Body wall, its structure. Head and head appendages, types of mouth parts, antennae, their structure and types. Thorax structure, thoracic appendages: legs and their modification. Wings, their modification and venation. Abdomen; structure, abdominal appendages. External genitalia, general structure and modification.

Unit 3: Embryology, Internal Anatomy and Physiology-

Embryonic and post embryonic development, physiology of ecdysis. Growth and metamorphosis, general features and types of larvae and pupae. Structure, function and physiology of digestive, circulatory, respiratory, reproductive, nervous and excretory systems. Sense organs; structure and types. Insect food and nutrition; minerals, carbohydrates, proteins and amino acids, lipids, vitamins and their role in growth and development, Extra and intra cellular micro organisms and their role in digestion, artificial diets.

Unit 4: Ecology-

Concept of ecology, Environment and its components- biotic and abiotic factors and their effects on growth, development, population dynamics, distribution migration and dispersal. Principle of biogeography and insects biodiversity. Biotic potential, carrying capacity and environmental resistance. Ecosystems, agroecosystems analysis, their characteristics and functioning. Intra and inter specific relationship; competition, predator-prey and host-parasite interactions, ecological niche and habitat. Life table studies, population models. Tropic level, food chain and food web. Food pyramids. Arthropod population monitoring, surveillance and pest forecasting. Diapause and causes of pest out breaks, pest risk analysis.

Unit 5: Arthropod Vectors of Plant Diseases-

Common arthropod vectors *viz.*, aphids, leaf hoppers, plant hoppers, whiteflies, thrips, psyllidae, beetles, weevils, flies, bees and mites and their relationship with the plant pathogenic fungi, bacteria, viruses, mycoplasma. Mechanism of pathogen transmission: Active mechanical transmission, biological transmission. Toxicogenic insects, mites and phytotoxemia. Some important arthropod vector transmitted diseases and their epidemiology in India. Management of vector and its effect on control of diseases.

Unit 6: Beneficial Insects-

Honey Bees- Honey bees and their economic importance. Bee species, their behaviour, habit and habitats. Bee Keeping: bee pasturage, hives and equipments, seasonal management. Bee enemies including diseases and their management, Bee poisoning.

Silkworm- Silkworm species, their systematic position and salient features. Rearing techniques of mulberry-muga-eri and tussar silkworms. Nutritional requirements of silkworms. Sericulture: rearing house and appliances, silkworm breeds, principles of voltinism and bivoltinism, seed production and its economics. Enemies and diseases of silkworms and their management. Sericulture organization in India.

Lac Insect- Lac insect, its biology, habit and habitats. Host Trees: pruning, inoculation, lac cropping techniques, and harvesting. Enemies of lac insect and their management.

Other Useful Insects- Pollinators, biocontrol agents of weeds, soil fertility improving agents, scavengers. Use of insects and insect products in medicines. Usefulness of insects in scientific investigations, insects as food.

Note :- Pattern of Question Paper

- 1. Objective type paper**
- 2. Maximum Marks : 75**
- 3. Number of Questions : 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.**