

**RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER**  
**SYLLABUS FOR COMPETITIVE EXAMINATION FOR THE POST OF**  
**LECTURER IN BOTANY FOR COLLEGE EDUCATION**  
**DEPARTMENT**

**PAPER-I**

- 1 Algae in diversified habitats (Terrestrial, fresh water, marine); Thallus organization, Cell structure and reproduction in different classes/groups; criteria in classification of Algae; Economic Importance of Algae.
- 2 General characteristic in different classes/groups of fungi, cell ultra structure, cell wall composition, reproduction, heterothallism, para sexuality, recent trends in classification, economic importance of fungi, mycorrhizae and lichens.
- 3 Archaeobacteria, eubacteria and cyanobacteria, ultra-structure and reproduction, Prions, L-Forms, Virioids, characteristics and ultra structure of virions, Mycoplasma, Spiroplasma and Phytoplasma - General characters and role in causing plant diseases, microbiology of water, air and soil.
- 4 General account of diseases caused by plant pathogens, molecular basis of host parasite interaction, pathogen attack and defense mechanism, diseases of important field crops of Rajasthan (red rot of sugar cane, rust of wheat, covered smut of wheat, loose smut of wheat, green ear disease of bajra, leaf spot and smut of jowar, ergot and smut of bajra, root knot and rot diseases of vegetables; diseases control and the role of information technology.
- 5 General characters, structure, reproduction, evolution and interrelationships in Bryophytes, Pteridophytes and Gymnosperms. Evolution of Stele; heterospory and seed habit, principles of palaeobotany.
- 6 Taxonomic hierarchy, principles of nomenclature, taxonomic tools, important systems of classification (Bentham and Hooker, Engler and Prantl, Hutchinson and Takhtajan) Role of morphology, anatomy, embryology, palynology, cytology, phytochemistry, genome analysis and nucleic acid hybridization in taxonomy, taxonomy of some selected families of Rajasthan (Leguminosae Cucurbitaceae, Asteraceae, Asclepiadaceae, Solanaceae, Euphorbiaceae and Poaceae), phylogeny of angiosperms.
- 7 General concept of plant morphology - origin and evolution of flower. primitive living angiosperms, foliar stamens, open carpels, organization of root and shoot apical meristems.
- 8 Development of male and female gametophytes, pollination, pollen pistil interaction, fertilization, endosperm development and embryogenesis, seed development and fruit formation, polyembryony apomixis, embryo culture, biochemistry and molecular biology of fruit maturation.

- 9 Basic concepts of ecology, ecological factors affecting plant growth, Principles of limiting factors, Population characteristics, population interaction, r and K selection, Genecology and range extensions, community characteristics, community classification, continuum concept, ecological niche, plant succession in various habitats, concept of climax. Structure and function of ecosystem, energy flow and biogeochemical cycles (N,P,C,S), primary production, plant indicators, major biomes of the world. Phytogeographical regions of India, vegetation of Rajasthan. Ecosystem services.
- 10 Environmental pollution- air, water, noise and soil, Green house effect, Ozone layer depletion, Acid rain, Concept of biodiversity with special reference to India, Hot spots, strategies for conservation of flora and fauna, Bio monitoring, Environmental Impact Assessment.
- 11 Plant civilization, centers of origin, gene diversity, utilization, cultivation and improvement of plants of food (rice, wheat, bajra, pulses, green gram, moth and beans) Oil seeds (mustard, soybean and ground nut), drugs (*Rauwolfia*, *Ephedra*, *Papaver*, *Atropa*, *Cinchona* and *Withania*), Fibre - Cotton, jute & coir and plants of industrial value - Tobacco, sugarcane, tea and coffee. Ethnobotany, underexploited plants of potential medicinal and food value with special reference to Rajasthan.
- 12 Light and Electron microscopy (TEM & SEM), Confocal Electron microscopy, phase contrast, fixation and staining, HPLC, electrophoresis, ELISA, Spectrophotometry, Centrifugation.

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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. There will be Negative Marking.**