

RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

SYLLABUS OF COMPETITIVE EXAMINATION FOR THE POST OF LECTURER (SCHOOL EDUCATION) AGRICULTURE

PAPER – II

PART-I Senior Secondary Level

Indian Agriculture: History, branches, scope and importance. Climate and weather. Soil- Composition, texture, structure, factors affecting soil structure, soil temperature of Rajasthan. Soils of Rajasthan. Nutrients and fertilizers, Irrigation and drainage. Agricultural implements and mechanisation. Organic Farming- Definition, importance, vermicompost, green manuring, biofertilizers, sustainable agriculture. Weed- definition, characteristics, classification, losses, weed control methods. Dryland farming and crop rotation- definition, importance and principles. Tillage- Definition, objectives, types, tillage. Cultivation of important crops: cereals and millets, pulses, oilseeds, fodder, commercial, fibre crops and seed spices of Rajasthan.

Importance of fruits and vegetables in human diet. Orchard- location and layout, Types of gendering. Planting system, training, pruning, intercropping, protection from frost and sunburn. Tree, shrubs, climbers, annuals, perennials- definition with examples. Propagation by seed, cutting, layering, budding and grafting. Nursery, its objectives and raising of seedlings. Cultivation practices, processing and marketing of: fruit crops- (mango, papaya, banana, guava, citrus, grapes, datepalm and pomegranate) vegetables- (radish, carrot, potato, onion, cauliflower, brinjal, tomato, spinach, okra, chilli and cabbage), flowers- (gladiolus, chrysanthemum, roses and marigold). Principles and methods of fruit and vegetable preservation. Preparation of jellies, jams, ketchup, chips, pickles and their packaging.

Development of milk industry in India. Important Indian and exotic breeds of cattle, buffalo, sheep, goat, camel and poultry. Different livestock development programmes running by government of Rajasthan. Importance of dairy and poultry products.

Introduction, Objectives and application of plant breeding. Important agricultural research stations of India. Important insect pest of crops and storage. Diseases of major crops of Rajasthan.

PART-II Graduation Level

Agro-climatic zones of India and Rajasthan, Agro-ecological Regions, Adaptation and distribution of crops. Climatic variables. Basics of weather forecasting. Modern concepts of tillage. Conservation agriculture. Straight and complex fertilizers, foliar

application. Plant nutrients: occurrence, cycling in soils and their availability. INM concept. Cropping and farming systems. Organic farming: principles, objectives, certification, labelling and accreditation process. Water resources of India and Rajasthan. Methods and systems of irrigation. Water management in crops. Soil plant water relation. Quality of irrigation water, CU, WR, drainage. Dryland agriculture in India and Rajasthan. Watershed, Moisture Conservation, Monsoon, Contingent crop Planning. Agronomy of important crops. Weed biology and ecology. Herbicide selectivity. Adjuvants.

Agriculture Statistics. Measurement of Central Tendency, Correlation, Regression, Test of Significance, F & Chi Square test, Experimental designs, CRD, RBD, SPD.

Soil fertility evaluation, nutrient recommendation. Formation and Management of saline, saline sodic, sodic and acid soils. Micro-organisms in soils and their role. Physical, Chemical and Biological properties of soil. Clay minerals, Soil reaction and buffering capacity.

Ornamental gardening, Vegetables- type of farming and classification. Raising of seedling in nursery and portray. Cultivation of important vegetables along with exotic vegetables like broccoli, kale, lettuce knol-khol Propagation and cultivation of important fruits of Rajasthan. Physiological disorders of important fruit and vegetable crops. Seed spices production technology. Post harvest management and value addition of horticultural crops. Introduction to forestry and hi-tech horticulture. Scope and Importance of medicinal crops.

Origin of life evolution and Eugenics. Cell and cell division. Mendelian principles of heredity, Multiple alleles and blood groups. Linkage, crossing over mechanisms, structural and numerical changes in chromosome, polygenes and continuous variations, cytoplasmic inheritance, genetic material, modes of reproduction and pollination, apomixis, self – incompatibility and male sterility, domestication, acclimatization, introduction; centre of origin, Plant genetic resources, its utilization and conservation. Variation – its causes and importance. Principles and breeding methods of self & cross pollinated crops and vegetatively propagated crops, Breeding for biotic and abiotic stresses, heterosis and inbreeding depression, population improvement, polyploidy, mutation and mutation breeding, release and notification of varieties, Patenting, PPV & FR Act 2001, Participatory Plant Breeding, Plant Breeders and Farmer's Rights. Seed technology, seed production of important crops of Rajasthan Minimum seed certification standards. Seeds Act, Seeds Control Order.

Chemistry of carbohydrates, lipids, proteins and plant (phyto) hormones. Chemistry of Nucleic acids and their functions. Outlines of metabolism of carbohydrate, lipid and protein. General account of enzymes, coenzymes and secondary metabolites. Brief outlines of plant biotechnology and micro propagation methods. Molecular markers and their application in Agriculture and biotechnology regulations. Transgenics, PCR techniques and its application.

Photosynthesis and photorespiration. Respiration. Physiology of flowering, Photoperiodism. Physiology of growth, PGRs and their role. Seed development, germination and dormancy.

Classification of economically important insects and mites upto family level. Study of ecosystems and wild life preservation. Insect dominance. Concept and principles of IPM, Components of IPM: Physical, mechanical, cultural, chemical (including novel insecticide molecules), biological, legal and other modern approaches. Identification, nature of damage, bionomics and management of insect-pests and mites of agricultural importance. Lac culture, sericulture and apiculture.

Milestones in plant pathology and nematology. Terms and concepts of Plant Pathology. General introduction to plant pathogenic organisms (Fungi, Bacteria, Phytoplasma, Nematodes Virus, Viroids). Causes and classification of plant diseases. Classification of plant pathogenic fungi, bacteria and nematodes. Morphology, growth, nutrition and reproduction of fungi and bacteria. Phanerogamic plant-parasites. Symptoms, etiology and management of important diseases of major cereals, pulses, oilseeds, fruits, vegetables, spices & cash crops. Fungicides and antibiotics and biocontrol practices for plant disease management.

Meaning and definition of extension education, philosophy and principles of extension, process of extension education, basic concepts in extension (need, knowledge, attitude, skill, behavior, objectives, rural leadership and motivation). Rural social institutions, caste, family and social groups. Post Independence era extension programmes in India. Teaching- learning process, teaching methods, use of audio-visual aids in training & communication process, communication models and barriers. Organizing trainings, front line demonstrations, field days, kisan mela, exhibition, campaign. Writing reports, radio talks, news, writing of farm literature and scientific information. Diffusion and adoption of an innovation, adopters categories.

Meaning and scope of Economics. Basic concept: Goods and services, desire, want, demand, utility, cost and price, wealth, capital, income and welfare. Agricultural economics: meaning, definition, characteristics of agriculture, importance and its role

in economic development. Demand: meaning and definition, kinds of demand, law of demand, demand schedule and demand curve, determinants of demand. Supply: Stock v/s supply, law of supply, supply schedule, supply curve, determinants of supply. Cost: Cost concepts, short run and long run cost curves. Concepts of rent, wage, interest and profit. National income: Meaning and importance, concepts of national income accounting and approaches to measurement. Tax: meaning, direct and indirect taxes, agricultural taxation, VAT, GST, MSP. Credit needs and its role in Indian Agriculture. Agricultural credit: meaning, definition and classification. 3R's, 5C's and 7P's of credit. Sources of agricultural finance: institutional and non-institutional sources. An introduction to higher financing institutions- RBI, NABARD, ADB, IMF, World bank, Insurance and Credit Guarantee Corporation of India. Financial statements- Balance Sheet and Income Statement. Meaning, concept and principles of farm management. Law of returns and returns to scale. Farm business analysis. Importance of farm records and accounts in managing a farm, farm inventory, balance sheet, profit and loss accounts. Meaning and importance of farm planning and budgeting, Concept of risk and uncertainty in agriculture production.

Classification of feeding stuff and computation of balance ration for various categories of farm animals. Conservation of feeds and fodder-hay and silage. Puberty, estrus cycle, pregnancy and parturition in farm animals. Milk secretion, composition, milking methods in dairy animals. Factors affecting milk yield and composition in farm animals. Breeding, feeding, housing and health management in livestock and poultry. Basis and methods of selection in livestock and poultry. Hatching, brooding and feeding management in poultry.

PART-III Post Graduation Level

Adverse climatic factors, Remote sensing, Herbicidal resistance, site specific nutrient management, concept and importance of water shed management in dry land areas, Good agronomic practices, Agro forestry systems, Effect of excess water on plant growth and production, drought, measurement of irrigation water; irrigation efficiencies, design of irrigation structures, Amelioration of salt affected soils.

Protected cultivations of vegetables and flowers, Role of PGR's in Horticulture, Micropropagation, Ripening and Maturity indices of important vegetables and fruits; Landscape, gardening and postharvest management of Flowers, dry land Horticulture.

Transgenic plants in relation to IPM. Exploitation of natural enemies in insect pest management, Semiochemicals and newer molecules of insecticides, biopesticides. Rearing of parasitoids and predators for inoculative and inundative release.

Major epidemics and their social impact, Disease forecasting. General principles of plant disease management and IDM. Plant resistance, Quarantine and abiotic disease of crop plants. Importance of edible fungi.

Combining ability and nature of gene action, Denaturation and renaturation, Gene amplification, Transposable genetic elements, Types/kinds of genes, Genomics and proteomics, Gene regulation, allele mining and TILLING, Bioinformatics, Nanotechnology, DNA sequencing, gene pyramiding, karyotyping, Alien addition and substitution lines, Endomitosis, Balanced Lethals. Plant ideotype concept and climate resilient crop varieties for future.

Peculiarities of Agricultural Marketing. Marketed and Marketable surplus. Functions of Agricultural Marketing, e-NAM, Marketing efficiency, Regulated Markets. Inflation, deflation, general price index, monetary and fiscal policy.

Factors affecting productive and reproductive efficiency in livestock and poultry. Selection and breeding of livestock and poultry for higher production. Constraints of cattle, buffalo, sheep, goat and camel production in Rajasthan. Management of livestock and poultry under adverse climatic conditions. Economics of milk and egg production. Common nutritional disorders in livestock and poultry.

Need assessment, benchmark survey and PRA technique. Programme planning. Monitoring & evaluation, impact assessment of programmes, SWOT analysis.

Part – IV (Pedagogy, Teaching Learning Material, Use of Computers and Information Technology in Teaching Learning)

I. Pedagogy and Teaching Learning Material (Instructional Strategies for Adolescent Learner)

- Communication skills and use of various verbal and non verbal classroom communication strategies.
- Teaching models- advance organizer and inquiry training (information processing) Group Investigation (Social Interaction) Non-Directive model (Personal development).
- Preparation and use of teaching-learning material during teaching.
- Cooperative learning.

II. Use of Computers and Information Technology in Teaching Learning

- Concept of ICT and Digital learning
- E-learning and Virtual Classroom.

- Technology integration in teaching-learning and assessment.

For the competitive examination for the post of **School Lecturer: -**

The question paper will carry maximum **300 marks**.

1. Duration of question paper will be **Three Hours**.
2. The question paper will carry **150 questions** of multiple choices.
3. 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.
4. Paper shall include following subjects: -
 - (i) Knowledge of Subject Concerned: Senior Secondary Level
 - (ii) Knowledge of Subject Concerned: Graduation Level.
 - (iii) Knowledge of Subject Concerned: Post Graduation Level.
 - (iv) Pedagogy, Teaching Learning Material, Use of Computers and Information Technology in Teaching Learning.
