Ph.D. Entrance Test Syllabus for Rural Studies

(A) Agriculture

Characteristics of Indian agriculture and its role in national economy, Agricultural Policy of the Nation, Recent trends in Agricultural development, Post-green revolution phase, Biotechnology and other technologies for sustainable agriculture.

(B) Extension for sustainable Rural Development

Its need and recent trends in extension work for rural development.

(C) Natural Resource Management and Sustainable Livelihood

Rural Livelihood pattern and role of NRM, need for NRM to strengthen livelihood prospects, Gender issues in livelihood development.

(D) Rain Water Harvesting and Water Management

Need of water harvesting and management, traditional methods and recent trends in water harvesting with special reference to drinking water. Watershed approach for rainwater harvesting water management technology.

(E) Theories of Development

Concept and meaning of rural development, need for and objectives of rural development, theoretical approaches to rural development, well known development theories, Robert Chamber's thesis of integrated rural poverty, Michel Lipton's Urban Bias Theory, Galbraith's Thesis of Accommodation, Gandhian Approach to Rural Development etc.

(F) Rural Development Policies

Need for Rural Development Policy, Goals of Rural Development policy, kinds of rural development, policy, strategies of rural development.

(G) Rural Development Organizations

Development Organizations at the national, state, district, taluka and village levels, their structure, role and functions, decentralization, state planning boards and their functions, voluntary agencies in rural development. Rural co-operatives and micro finance institute.

(H) Social Research

Emerging trends in Rural Society (Assignment based), The Concept of social research, The sources of research ideas, Framing of research questions, Science and scientific methods(s) in the field of social sciences, Issues of Ethics and values in Social research

(I) Fundamental Concepts in Conducting Research

Theory, Facts, Hypothesis, Research Designs, Action Research

(J) Methods of data collection and analysis

Sample, Qualitative data, Quantitative data, Pre-testing, Pilot Survey, Interview, Questionnaire, Observation, Content analysis, Case Study, Survey Methods, Applications of Computer in research.

Ph.D. Entrance Test Syllabus for Microbiology

General Microbiology

History and scope of microbiology, classification and nomenclature of microorganisms, microbial cell structure and function including bacteria, archaea, fungi, algae, protozoa, and viruses, microbial growth, nutrition and cultivation, microbial physiology and metabolism, microbial genetics including DNA replication, transcription and translation, plasmids, transposons, mutations, recombination and horizontal gene transfer, molecular tools in microbiology, antimicrobial agents and resistance mechanisms, immunology and host–microbe interactions, as well as genomics, proteomics and bioinformatics applications.

Agricultural Microbiology

Soil microbiology and soil microorganisms, rhizosphere and phyllosphere microbiota, biological nitrogen fixation both symbiotic and non-symbiotic, mycorrhizal associations, microbial role in nutrient cycling including carbon, nitrogen, phosphorus and sulfur cycles, biofertilizers and microbial inoculants, biopesticides and plant growth-promoting rhizobacteria (PGPR), plant–microbe interactions, plant pathogenic microorganisms and mechanisms of pathogenesis, biocontrol agents and microbial biotechnology in agriculture, bioremediation and microbial diversity in agriculture, along with metagenomics approaches in agricultural microbiology.

Food Microbiology

Microorganisms in food and their significance, microbial spoilage of foods, factors influencing microbial growth in foods, foodborne pathogens and toxins, principles and methods of food preservation, fermented foods and beverages, starter cultures and probiotics, food safety and quality assurance, HACCP and food microbiology standards, rapid methods in food microbiology, biosensors and molecular diagnostics in food safety, and emerging concepts in functional foods and food security challenges.

Fundamental Concepts in Conducting Research

Theory, Facts, Hypothesis, Research Designs, Action Research

Methods of data collection and analysis

Sample, Qualitative data, Quantitative data, Pre-testing, Pilot Survey, Interview, Questionnaire, Observation, Content analysis, Case Study, Survey Methods, Applications of Computer in research.

Ph.D. Entrance Test Syllabus for Agro-Food Processing

Post-Harvest Management and Primary Processing:

Post-harvest management, crop maturity indices, harvesting techniques, handling methods, cold chain management, storage structures, preservation techniques, quality parameters, cleaning, grading, sorting, and value addition.

Food Science, Processing and Preservation

Food groups, macronutrients, micronutrients, balanced diet, culinary terms, cooking methods, processing of cereals, pulses, roots, tubers, nuts, oilseeds, fruits, vegetables, spices, physical preservation, chemical preservation, biological preservation, and radiation methods.

Dairy, Bakery, and Confectionery Technology

Milk composition, milk processing techniques, standardization, pasteurization, homogenization, sterilization, UHT treatment, fortification, dairy products, cream, ghee, yogurt, paneer, khoa-based sweets, cheese, condensed milk, bakery principles, bread, biscuits, cakes, cookies, pastries, and confectionery products.

Non-Food Agro Products, Unit Operations, and Emerging Technologies

Biofuels, natural fibers, essential oils, medicinal plants, animal-based products, forest-based products, biogas, resins, dyes, paper, timber, unit operations, size reduction, separation, mixing, enzymatic reactions, expression, extraction, solvent extraction, supercritical fluid extraction, nanotechnology, biosensors, smart packaging, and sustainable agro-food technologies.

Fundamental Concepts in Conducting Research

Theory, Facts, Hypothesis, Research Designs, Action Research

Methods of data collection and analysis

Sample, Qualitative data, Quantitative data, Pre-testing, Pilot Survey, Interview, Questionnaire, Observation, Content analysis, Case Study, Survey Methods, Applications of Computer in research.