



**Department of Agronomy Institute of Agricultural Science,
Calcutta University**

1. **7 (seven) vacancies** exist in the Department for admission to Ph.D. considering the strength and availability of faculty members. Reservation will be followed as per the WB(Part-I)/2014/SAR
2. The **Research Eligibility Test (RET)** for Ph.D. programme in Agronomy will be held on 12th July, 2016 at 2 p.m.
3. The last date for submission of application form is 11th July, 2016.
4. The **RET** will be of 50 marks. The question pattern will be of objective type or short answer type. The Duration of the entrance test will be one hour.
5. An interview will be held on 13th July, **2016 at 2 p.m.** for **RET** qualified (Qualification bench mark – 50% of the total marks) as well as NET/GATE qualified candidates. Successful candidates will be eligible to register for their Ph.D. in Department of Agronomy.
6. **Eligibility:** Candidates with at least 50% Marks obtained in M.Sc. (Ag.) in Agronomy from any UGC/ICAR recognized University are eligible to appear in the Examination. Those who have qualified in NET/GATE would be exempted from the RET examination. They may directly submit a statement of purpose or research in brief and appear in the interview.

HEAD

Department of Agronomy

SYLLABUS FOR THE RESEARCH ELIGIBILITY TEST FOR Ph.D. PROGRAMME IN AGRONOMY DEPARTMENT

Section 1: Basic Principles

Origin and distribution of field crops. Physical, chemical and biological factors affecting growth and development of field crops. Modern concepts of tillage. Cropping patterns and systems. Plant growth analysis. Plant population, sowing techniques, time and depth. Crop yield components.

Section 2: Crop Ecology

Environmental factors affecting distribution and adaptation of crops. Agro-ecological and agroclimatic regions. Ecological factors affecting crop growth. Crop yield and agro-meteorological relationships. Crop yields and ecological optima. Adverse climatic factors and crop productivity.

Section 3: Weed Management

Principles of weed management. Weed-classification, biology, ecology and allelopathy. Crop weed competition. Herbicides-classification, mode of action, selectivity and resistance. Persistence of herbicides in soils and plants. Application-methods and equipment. Biological weed control, bio-herbicides and myco-herbicides, Integrated weed management. Special weeds, parasitic and aquatic weeds and their management in crops, cropping systems, and non-cropped lands.

Section 4: Water Management

Soil-water-plant relationships. Soil moisture stress and plant growth. Modern concepts in irrigation management. Methods of determining water and irrigation requirements of field crops. Consumptive use of water and methods of computation including empirical formulae. Quality of irrigation water. Scheduling of irrigation under assured and limited water supply. Factors affecting water use efficiency. Water management in field crops and cropping systems. Methods of irrigation-merits and limitations. Conjunctive use of water.

Section 5: Nutrient Management

Concept of essentiality of plant nutrients, their availability, management and diagnostic techniques. Concepts of soil fertility and productivity. Organic matter and organic manures. Cropping systems and soil fertility relationships. Fertilizers, their classification, composition, mineralization, availability and reaction products in relation to crop nutrition. Principles and methods of fertilizer application. Fertilizer use efficiency in different situations. Integrated nutrient management.

Section 6: Dryland Agriculture

Crop selection criteria for drylands. Concept of intercropping/mixed cropping in drylands. Precipitation-collection, conservation and utilization. Crop production under moisture stress situations. Contingency crop planning for aberrant weather conditions. Use of mulches and transpiration suppressants, Fertilizer management in dryland crops. Cropping patterns and crop diversification in dryland.

Section 7: Crop Production in Problem Areas

Principles of field drainage. Excess soil water and plant growth. Cropping systems/patterns on poorly drained soils. Problem soils and their distribution in India. Management of acid, saline and alkali soils. Excess salt and water tolerant crops. Crop production techniques in problem soils.

Section 8: Crop Production

Crop production techniques for cereals, legumes, oilseeds, fibre crops, sugarcane, tobacco and potato crops including distribution, season, adaptability, climate, soil and water requirements, and component technology, quality characteristics, uses and seed production techniques.

Section 9: Agricultural Statistics

Frequency distribution, mean, media and mode, Correlation and response function. Tests of significance-t, f and chi; - square tests. Designs of experiments—basic principles, completely randomised, randomised block design, latin square split, strip, factorial and simple confounding designs.

Section 10: Sustainable Land Use Systems

Concept of sustainability. Alternate land use systems. Types, extent and causes of wastelands. Concept and types of agro-forestry systems. Bioenergetics of crop production systems.