INDIAN STATISTICAL INSTITUTE

Recruitment for posts of
Associate Scientist A
(Specialization: Agriculture)

SECTION II

Syllabus for Online and Skill Tests

• **Crop Production:** Agronomic techniques of production of major agricultural and horticultural crops; Cropping systems; Agrometeorology; Growth and development of crops in adverse environmental conditions; Dryland agriculture; Weeds and their management; Soil fertility and fertiliser use; Integrated nutrient management; Sustainable land use systems; Soil, plant, water and atmosphere relationships; Principal and methods of seed production of major crops; Requirements and types of seed storage; Farm mechanisation and equipment; Tillage and pesticide application equipment; Precision agriculture.

• **Crop Protection:** Basics of insects, mites, plant parasitic nematodes and plant pathogens; Insect and nematode ecology; Plant disease epidemiology; Major pests (including nematode pests), diseases (fungal, bacterial and viral) and disorders of major agricultural and horticultural crops; Cultural, physical, biological, biotechnological, chemical and integrated management of pests and diseases; Host plant defence; Plant-pest relationships.

• **Agricultural Chemistry and Soil Science:** Pedogenic processes and their relationships with soil properties; Rocks, minerals and other soil forming materials; Soil texture, Soil structure and classification, Bulk density and particle density of soils and porosity; Humus, Humic acid, Fulvic acid; Soil moisture, Soil erosion, Land degradation; Soil colloids, Chemical equilibria, Chemical kinetics, Clay minerals, Adsorption-desorption, Cation and anion exchange, Soil organic matter; Essential elements in plant nutrition, Nutrient cycles in soil, Macro and micro nutrients in soil, manures and fertilizers, lime and gypsum requirement; Acid, Acid sulphate, Saline and alkali soils and their management; Irrigation water quality, Major soil groups of India; Soil and water pollution; Greenhouse gases; Soil biota, Soil microbial ecology, Types of organisms, Soil enzymes, Biofertilizers, Methods of soil analysis, Instrumentation.

• **Agricultural Statistics:** Measures of central tendency and dispersion; Sampling methods; Probability distribution, Design of experiments; Correlation and regression analysis; Tests of significance; Analysis of variance; Probit analysis.
Sample Questions for the Online Test

*Note: For each of the questions there are four suggested answers, of which only one is correct. You will score 4 marks for each correctly answered question, 0 mark for each incorrectly answered question, and 1 mark for each unattempted question.*

1. Which among the plants have the highest water use efficiency?
   (a) C3  (b) C4  (c) CAM  (d) All of these

2. _______ % depletion of available moisture is optimum for ploughing
   (a) 0 – 25  (b) 25 – 50  (c) 50 – 75  (d) All of these

3. Growth regulator used in hybrid rice seed production programme is
   (a) NAA  (b) GA3  (c) ABA  (d) CCC

4. Which of the following is a ripening hormone
   (a) GA-3  (b) Auxin  (c) Cytokinin  (d) Ethylene

5. Browning of cauliflower is caused by the deficiency of
   (a) Zinc  (b) Iron  (c) Boron  (d) Manganese

6. Which of the following is a carbamate pesticide?
   (a) Aldicarb  (b) Heptachlor  (c) Malathion  (d) Endosulfan

7. Nematicide that liberate methyl isothiocyanate is
   (a) Oxamyl  (b) Carbofuran  (c) Aldicarb  (d) Dazomet

8. For preparation of 5 litres of 0.5% Bordeaux mixture, the amount of CuSO$_4$ required is
   (a) 0.5g  (b) 5g  (c) 25g  (d) 50g

9. Availability of which of the following nutrients increases under waterlogged condition?
   (a) P  (b) Fe  (c) Mn  (d) All of these

10. What are the basic principles of design of experiments?
    (a) Randomization  (b) Local control  (c) Replication  (d) All of the above