

AGRICULTURE

Paper – II

*Time Allowed : **Three Hours***

*Maximum Marks : **200***

Question Paper Specific Instructions

Please read each of the following instructions carefully before attempting questions :

*There are **EIGHT** questions in all, out of which **FIVE** are to be attempted.*

*Questions no. **1** and **5** are **compulsory**. Out of the remaining **SIX** questions, **THREE** are to be attempted selecting at least **ONE** question from each of the two Sections A and B.*

Attempts of questions shall be counted in sequential order. Unless struck off, attempt of a question shall be counted even if attempted partly. Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.

All questions carry equal marks. The number of marks carried by a question/part is indicated against it.

*Answers must be written in **ENGLISH** only.*

SECTION A

- Q1.** (a) Explain variation along with various components of variation. Discuss the method of plant breeding useful for creation of variability in plants. 8
- (b) Name the public sector institutions involved in seed sector in India, with their specific roles. 8
- (c) Discuss the term 'transpiration' and its role in plants. 8
- (d) Enlist different organelles of a plant cell with suitable diagram and discuss the role of cell wall in a cell. 8
- (e) Discuss the role of hybrids in enhancing productivity of major cereal crops in India. 8
- Q2.** (a) Write the various phases of history of plant breeding and describe the importance of genetic engineering phase of plant breeding. 15
- (b) What do you understand by plant genetic resources ? Explain the methods of conservation and utilization of plant genetic resources. 15
- (c) What are C_3 and C_4 plants ? Discuss their basic differences with examples and their adaptation to changing climatic conditions. 10
- Q3.** (a) Explain gene pool concept along with different groups of gene pools. Name the scientist who proposed centres of origin along with the total number of centres of origin of plants in the world. 15
- (b) Describe the suitable methods of plant breeding along with their application for development of disease-resistant varieties in crops, with suitable examples. 15
- (c) Write the various laws of heredity given by Mendel. Discuss the significance of the law of dominance in plant breeding. 10
- Q4.** (a) Describe cytoplasmic inheritance along with sex-linked, sex-limited and sex-influenced characters with suitable examples. 15
- (b) Define various parameters of field and seed standards adopted in quality seed production programmes in cross-pollinated crops in India. 15
- (c) Write the various types of male sterility available in plants and describe the commercial application of male sterility in vegetable seed production. 10

SECTION B

- Q5.** (a) Describe the plug-tray nursery production technology in vegetables, along with its advantages. 8
- (b) Enlist the major fungal and bacterial diseases of Solanaceous vegetables along with their effective management. 8
- (c) What are the different types of fungi invasions in storage of pulses in India ? Explain the different methods of their control. 8
- (d) Write a short note on microbial toxins. 8
- (e) Discuss the prime features of National Food Security Act, 2013. 8
- Q6.** (a) Describe the package of practices of Pomegranate cultivation in India along with major challenges in its cultivation in arid and semi-arid regions. 15
- (b) Why are millets called 'Nutri-cereals' ? Discuss the initiatives of Government of India to increase production and consumption of millets in the country. 15
- (c) Explain seed dormancy and its types, with reasons for induction. Discuss in brief about the mechanisms to break dormancy in seeds. 10
- Q7.** (a) Describe the major problems in marketing of fruits and vegetables along with important suggestions for stabilization of prices of tomato, onion and potato in India. 15
- (b) Write the package of practices of Okra cultivation during *Kharif* season in India. 15
- (c) Explain the photoperiodic responses of plants. What is the significance of vernalization in flowering of plants ? 10

- Q8.** (a) Enlist the major constraints of food procurement in India. How can National and International food policies help in sustainable food security? 15
- (b) Explain Integrated Pest Management (IPM). Discuss the biological control of pests and diseases in horticultural crops with special reference to Thrips and Mites. 15
- (c) Describe the role of biofortification in horticultural crops in human nutrition, with suitable examples. 10