

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.

Neat sketches may be drawn, wherever required.

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

SECTION A

- Q1.** (a) Give a brief description of plasma membrane structure (with labelled diagram) and its functions. 8
- (b) What do you understand by passport data of genetic resources ? Write its importance in germplasm collection and conservation. 8
- (c) Describe different classes of seeds. What are the essential requirements for production of certified seeds ? 8
- (d) Discuss in brief the practical significance of plant physiology in agriculture. 8
- (e) Explain the methods for linkage detection in recombinant breeding programme. 8
- Q2.** (a) What are chromosome structure models ? Describe various models with the help of suitable diagrams. Which models are widely accepted and why ? 15
- (b) Differentiate between the following : $3 \times 5 = 15$
- (i) Apomixis and Parthenogenesis
 - (ii) Quantitative traits and Qualitative traits
 - (iii) Recurrent Selection for General Combining Ability (RSGCA) and Recurrent Selection for Specific Combining Ability (RSSCA)
 - (iv) Avoidance and Non-Preference
 - (v) Penetrance and Expressivity
- (c) Write a note on chlorophyll pigments. 10
- Q3.** (a) Write in detail about the anatomy and cytology of stomata. Also, explain about the factors affecting stomatal movement. 15
- (b) Explain the various parameters of field and seed standards for breeder seed production. Write the field and seed standards for wheat and maize. 15
- (c) What are the components of genetic variance ? How are these components estimated ? 10

- Q4.** (a) Write the breeding objectives for improvement of wheat and gram. Describe the pedigree method of breeding for crop improvement. 15
- (b) How does CO_2 fixation take place in succulent plants ? Why do the stomata open at night and close during the day in CAM plants ? Mention the families of Angiosperms in which succulents are available. 15
- (c) Give a brief account of genetically modified crops with suitable examples. 10

SECTION B

- Q5.** (a) What is bud dormancy ? Explain its causes and the means to break bud dormancy. 8
- (b) Write the preparation method of Ready to Serve (RTS) beverages and squashes. 8
- (c) Write the causal organisms, nature of damage and management practices for damping off in vegetables. 8
- (d) Discuss the preventive measures for management of stored grain pests and diseases. 8
- (e) The rice-wheat system has been dominating the national agricultural scenario for the last four decades, in spite of the fact that the water table has been going down year after year. Why ? 8
- Q6.** (a) Explain the biosynthesis of gibberellins. Also, list the role of gibberellins in plants. With suitable examples, write about the commercial uses of gibberellins in agriculture. 15
- (b) Give an account of the area, production and productivity trends with respect to oil seeds and pulses during the last decade in India. What are the agronomic interventions for further boosting up their production ? 15
- (c) Explain the biological control methods for tomato fruit borer and guava wilt. 10
- Q7.** (a) Describe the package of practices for mango cultivation in North India considering suitable varieties for processing, soil and climate requirements, fertilizer requirement, propagation method, management of mango malformation and alternate bearing. 15
- (b) Write in detail about the causal organism, nature of damage and management of the following diseases and insect pests : $5 \times 3 = 15$
- (i) Cotton white fly
- (ii) Cotton mealy bug
- (iii) Chickpea pod borer
- (c) How does photoperiodism influence plant growth and development ? Explain with suitable examples. 10

Q8. (a) Write a note on malnutrition among women and children. How can fruits and vegetables production trends help in mitigating malnutrition ?

15

(b) Discuss the cultivation practices for cauliflower considering the following points :

3×5=15

- (i) Soil and climate requirements
- (ii) Varieties, seed rate and sowing time
- (iii) Nursery raising and transplanting method
- (iv) Management of physiological disorders
- (v) Harvesting and yield

(c) Describe the causal organism, nature of damage and management of the following stored grain pests :

5×2=10

- (i) Rice weevil
- (ii) Khapra beetle

