

CSM – 7 / 15
Agriculture
Paper – II

Time : 3 hours

Full Marks : 300

The figures in the right-hand margin indicate marks.

*Candidates should attempt Q. No. 1 from Section – A and Q. No. 5 from Section – B which are compulsory and **three** of the remaining questions, selecting at least **one** from each Section.*

Section – A

1. Answer any **three** of the following in about 200 words each : 20×3 = 60
 - (a) Discuss the importance of combining ability in plant breeding. Enumerate the strategies adopted in breeding crop varieties for resistance to pests and diseases.

- (b) Write notes on any **four** of the following :
- (i) Euploids and Aneuploids
 - (ii) DNA and RNA and their importance in agriculture
 - (iii) Significance of linkage and crossing over in crop improvement
 - (iv) Heterosis and its importance in crop improvement
 - (v) Pureline and pedigree selections
- (c) Draw a sketch on how the biotechnology has been exploited in crop breeding and the significant achievements made with suitable examples of agricultural and horticultural crops.
- (d) What is meant by chromosomal aberrations ? Give a brief account on gene structure and its function. How can the cytoplasmic inheritance be used in crop breeding ?

2. How would you test the seed viability ? Narrate the crops in which how the hybrid seeds are produced. Explain how the private sectors are involved in crop seed production and its impact on agriculture. 60

3. (a) Distinguish between the following :

20×3 = 60

- (i) Water Use Efficiency and Photosynthetic Efficiency
 - (ii) Aerobic and anaerobic respiration and their significance in crop growth
 - (iii) Heritability and Incompatability
 - (iv) Back cross and Test cross
- (b) Define growth and development and give an example for each process and their impact on crop production.
- (c) Give a brief note on the importance of photoperiodism and vernalization in agriculture.

4. Answer any **three** of the following :

- (a) Among the C₃ and C₄ crops which are photosynthetically efficient and why ? How would you improve the efficiency ? 20
- (b) Give a brief account on different plant growth regulators and their role in crop production. 20
- (c) Discuss how the fats are synthesized in oilseeds crops with suitable examples. 20

- (d) Narrate the physiological changes that occur during seed germination and how would you break and induce seed dormancy. 20

Section – B

5. Answer any **three** of the following each in about **200** words : $20 \times 3 = 60$

- (a) What do you mean by greenhouse gases and discuss the impact of global warming in agriculture ?
- (b) Give a brief account of the methods of preservation of fruits and vegetables and narrate how they are processed.
- (c) What do you mean by land scaping and how would you design lawn and/or garden for a specific purpose ?
- (d) Narrate the various techniques of dryland horticulture and the crops suitable and their economic importance.
6. (a) Write down mode of action of contact and systemic pesticides with suitable examples.

20

- (b) Give a brief account of the various diseases and pests of vegetable and fruit crops and their management. 20
- (c) What do you mean by compatibility ? Give a brief account of the significance of biological control of pests and diseases in horticultural crops with suitable examples. 20
7. Discuss the storage pests and diseases that occur in pulses with examples and their control. Briefly explain about the commercial cultivation of mushroom. 60
8. (a) Explain how the food production and its consumption pattern in national dietary and its impact in alleviating malnutrition. 20
- (b) Constraints in food processing and distribution. 20
- (c) Post-harvest losses and its management. 20

