

CSM—9/23
PART—II/PAPER—VII
AGRICULTURE
PAPER—II

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Time : 3 Hours

Full Marks : 250

*The question paper contains **18 (Eighteen)** questions
in **GROUP—A (12)** and **GROUP—B (06)** together.*

GROUP—A

*Candidates to attempt **10 (ten)** questions within word limit of **250**.
Each question carries **15** marks.*

1. Define polyploidy and differentiate between euploids and aneuploids. Explain their roles in plant breeding and discuss how induced polyploidy has contributed to crop improvement with examples.
2. Describe cell structure, different cell organelles and their functions with the help of neat diagrams.
3. What is mutation breeding? Differentiate between micro-mutations and macro-mutations. Discuss their roles in crop improvement, providing suitable examples of mutant crop varieties developed through mutation breeding.
4. What is cytoplasmic male sterility? Discuss the genetic and molecular mechanism of CMS. What are its applications in agriculture?
5. Explain different breeding techniques that can be employed in self-pollinated crops.
6. Explain the seed production and processing techniques for different classes of seed in a cross-pollinated crop.

7. Explain the modern concepts of photosynthesis and the factors affecting its efficiency. Compare the C3, C4 and CAM pathways, discussing their advantages and adaptations in different plants.
8. Discuss the role of plant growth regulators and their modes of action in agriculture.
9. Define photoperiodism and vernalization. How do these influence plant growth and development?
10. Differentiate between sex-linked, sex-influenced and sex-limited traits and analyze their significances with suitable examples.
11. Explain the different methods of conserving crop genetic resources. Explain the steps in germplasm conservation and utilisation.
12. Explain the concepts of imbibition, surface tension, diffusion and osmosis in plants. Discuss their significances in plant physiology and their roles in water absorption, nutrient transport and overall agricultural productivity.

GROUP—B

*Candidates to attempt **05 (five)** questions within word limit of **300**.*

*Each question carries **20** marks.*

13. Discuss the significances, techniques and challenges of dryland and high-tech horticulture in enhancing productivity and sustainability of horticultural crops.
14. Describe the different methods of preserving important fruits and vegetable products. Discuss various processing techniques and the equipments used in the food processing industry.
15. What is Integrated Pest and Disease Management (IPDM)? Discuss its significance in modern agriculture, highlighting its components and practical applications.
16. What are the formulations and modes of action of pesticides and how do their compatibility with rhizobia inoculants impact soil health and crop productivity?

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17. What are the storage pests and diseases affecting cereals, oilseeds and pulses and how do they impact post-harvest losses? What strategies are used for effective control?
18. Discuss the key national and international food policies. How do these policies impact food security and agricultural sustainability?

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SPACE FOR ROUGH WORK

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