

2023

**BOTANY — HONOURS**

**Paper : SEC-B-3**

**(Plant Breeding)**

**Full Marks : 80**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

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**LIBRARY** 2×10
1. Answer the following questions :
- (a) State two limitations of conventional plant breeding.
  - (b) Define centre of origin of crop plants with two examples.
  - (c) Define the term 'germplasm'.
  - (d) What do you mean by cytoplasmic male sterility?
  - (e) Name India's National-level institute for Management of plant genetic resources.
  - (f) Give examples of two types of molecular markers used in plant breeding.
  - (g) What is inbreeding depression?
  - (h) Distinguish between test cross and back cross.
  - (i) Cite two examples of genetically modified crops.
  - (j) Define the term heterosis.
2. Answer *any four* of the following : 5×4
- (a) Give a brief outline of the different methods of germplasm conservation.
  - (b) Write a note on the importance of marker-assisted selection method in plant breeding.
  - (c) Write a short note on back cross method and its application.
  - (d) How does Allopolyploidy help in crop plant evolution?
  - (e) Describe the role of plant tissue culture technique in plant breeding.
  - (f) Write a note on the role of distant hybridization in crop improvement.
3. Answer *any four* of the following :
- (a) What is plant introduction? Describe in brief the procedure of plant introduction. Mention the different agencies involved in this process in India. List the drawbacks associated with this process. 1+5+2+2

**Please Turn Over**

- (b) What is apomixis? Describe the different types of apomixis in higher plants. Add a note on the significance of apomictic plants. 2+5+3
- (c) Discuss the difference between mass selection and pure line selection method. Which method is more acceptable for a cross pollinated crop and why? 6+4
- (d) Differentiate between genetic and cytoplasmic genetic male sterility. Discuss the process of hybrid seed production using cytoplasmic genetic male sterility. 2+8
- (e) Explain in detail the genetic basis of heterosis. How is this phenomenon utilized in plant breeding? 8+2
- (f) Briefly mention the role of mutation in crop improvement. Cite examples of two achievements made with this technique. 8+2

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