2022

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.

1. Answer the following questions : 2×10

(a) Mention two applications of back cross method.

(b) What is meant by hybrid seed?

(c) What is QTL?

(d) Define plant introduction.

(e) What is the function of NBPGR?

(f) Name two vectors used for plant gene transfer.

(g) Define genetic erosion.

(h) Mention one merit and one demerit of pure line selection.

(i) State two objectives of plant breeding.

(j) What is somaclonal variation?

2. Answer ***any four*** of the following :

(a) Write a short note on the centres of origin and domestication of crop plants. 5

(b) Write a short note on cytoplasmic genetic male sterility. 5

(c) State the procedure of mass selection and its application. 5

(d) What is transgenic plant? Give two examples of transgenic plants developed by gene transfer technique. Which was the first successful transgenic plant available commercially? 2+2+1

(e) How does aneuploidy help in crop improvement? 5

(f) Write a short note on clonal selection. 5

3. Answer ***any four*** of the following :

(a) Discuss the selection methods for self-pollinated and cross-pollinated plants. Mention two merits of each of the two methods. 6+4

(b) Discuss the role of mutations in crop improvement. State applications and limitations of mutation breeding. 5+5

(c) Define emasculation. State the objectives of hybridization. Discuss distant hybridization mentioning its barriers and techniques applied for production of distant hybrids. 2+3+(3+2)

(d) What is inbreeding? What are the effects of inbreeding? Define hybrid vigour. Explain its applications. 2+3+2+3

(e) What is germplasm? Comment on the importance of germplasm maintenance. Define *in situ* germplasm conservation. Mention its demerits. 2+5+1+2

(f) Describe briefly about various types of molecular markers. Mention one advantage and one limitation of molecular markers. 8+2
