

2025

**M.Sc. in Agriculture
1st Semester Examination**

GENETICS AND PLANT BREEDING

Paper : GPB-502

(Principles of Plant Breeding)

Full Marks : 70

Time : Two Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers

in their own words as far as practicable.

Group - A

Answer any five questions : 2×5=10

1. What is transgressive segregation?
2. State the Hardy-Weinberg law.
3. Differentiate between synthetic and composite varieties.
4. What is meant by inbreeding depression?
5. Define apomixis.
6. What is genetic erosion?
7. Define protandry and protogyny.

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(2)

8. What is base collection and active collection of germplasm?

Group - B

Answer any *four* questions : $5 \times 4 = 20$

9. Define heterosis. Explain the dominance hypothesis of heterosis. 1+4
10. What is mutagen? Write down different types of mutagens with examples. 1+4
11. Briefly explain the origin of hexaploid wheat. How the triticale was developed? 3+2
12. Distinguish between pedigree method and bulk method of breeding.
13. Write a short note on pure-line theory as proposed by Johannsen.
14. Briefly explain megasporogenesis and microgametogenesis. Mention the genetic basis of self-and cross-pollinated plant. 3+2

Group - C

Answer any *two* questions : $10 \times 2 = 20$

15. What is male sterility? Briefly discuss about the CGMS system of male sterility. Write a short note on Barnase-barstar system. 1+4+5

16. Define recurrent parent. Describe the procedure of backcross method for the transfer of a dominant gene. Mention the merits and demerits of backcross method. 1+7+2
17. Write a short note on boom-and-bust cycle. Explain the gene-for-gene hypothesis with a suitable example. 4+6
18. Define hybridization. Briefly describe the different methods of emasculation. Elucidate the different sources of genetic variation. 1+4+5

Internal Assessment : 20 marks
