



PG
M.Sc. Semester-I Examination, 2023
(AGRICULTURE) IN GENETICS AND PLANT BREEDING
PAPER: GPB 503
(FUNDAMENTALS OF QUANTITATIVE GENETICS)

Full Marks: 50

Time: 2 Hours

The figures in the right-hand margin indicate full marks.
 Candidates are required to give their answers in their own words as far as practicable.

GROUP-A

1. Answer any FIVE questions from the following: 2 X 5 = 10

- a) Define quantitative and qualitative trait.
- b) What is transgressive segregation?
- c) Classify heterozygous homogeneous and homozygous heterogeneous population.
- d) What is Heterozygotic potential variability?
- e) What is ray and glyph in metroglyph analysis?
- f) Differentiate between correlation and path analysis.
- g) Explain about residual effect of path analysis.
- h) How degrees of freedom is determined?

GROUP-B

2. Answer any FOUR questions from the following: 5 X 4 = 20

- a) Who gave the concepts of PCA analysis? Explain the merits and demerits of PCA analysis. 1+4
- b) What is Triple test cross? Write down the main features of triple test cross. 1+4
- c) Who developed the procedure of diallel cross analysis? Explain the numerical approach of diallel cross. 1+4
- d) Write down the main features of partial diallel analysis. Differentiate between full diallel and half diallel cross. 3+2
- e) List the mating designs of biparental cross. Explain the main features of NCD3. 1+4
- f) How five parameter model of generation mean is analysed.
- g) What is breeding value? Explain the main features of breeding value. 2+3

GROUP-C

3. Answer any TWO questions from the following: 10 X 2 = 20

- a) What is QTL mapping? State its basic principles. How QTL mapping is utilized in genetic analysis? 1+3+6

(P.T.O.)



(2)

- b) Write down the different types of molecular marker. Briefly explain marker assisted selection and factor affecting marker assisted selection. 5+5
- c) What are the different models of stability analysis. Briefly explain about Eberhart and Russel model of stability analysis. 1+9
- d) What is heterobeltosis? Describe the over dominance theory of heterosis. How can heterosis be exploited in crop plants. 1+5+4
