

U.G. 5th Semester Examination - 2024**BOTANY****[HONOURS]****Discipline Specific Elective (DSE)****Course Code : BOTH-DSE-T-02A****(Plant Breeding and Biometry)****Full Marks : 40****Time : 2½ Hours***The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any five of the following questions: $2 \times 5 = 10$
 - a) What do you mean by Plant acclimatization?
 - b) Define inbreeding depression.
 - c) What is clonal selection?
 - d) What do you mean by natural emasculation?
 - e) Mention the advantages of bulk method.
 - f) How will you calculate the cumulative frequency from grouped data?
 - g) Define Null hypothesis.
 - h) If the frequency of A allele in a population at Hardy-Weinberg Equilibrium is 0.4, then what will be the frequency of Aa individuals?

[Turn over]

2. Answer any two of the following questions: $5 \times 2 = 10$

- Discuss different methods of germplasm maintenance.
- Explain Polygenic inheritance with suitable example.
- Describe the inheritance pattern of Kernel colour in wheat.
- Make a divided bar diagram and percentage bar diagram from the total cereal crop production from the following data:

Years	Rice Metric tons)	Wheat Metric tons)	Maize Metric tons)	Millet Metric tons)	Total Metric tons)
1993-94	1383	634	513	400	2930
1994-95	2021	1383	521	313	4238
1995-96	1914	1413	551	900	4578
1996-97	2664	1636	424	265	4989

3. Answer any two of the following questions: $10 \times 2 = 20$

- Define Mass selection. Discuss the method of Mass selection. Compare Mass selection and Pure line selection. $1+5+4=10$

- What is Standard deviation? Why measurement of Standard deviation is more applicable than Mean deviation? In an experiment, Ten *Ipomea* plant were taken for their nitrogen content (mg/g of dry sample). The data are as follows:

Sample	1	2	3	4	5	6	7	8	9	10
N ₂ content (mg/g of dry sample)	3.52	4.54	3.34	3.58	3.46	3.39	3.59	3.62	3.57	3.51

Find out the Standard deviation and Standard error.

$$2+3+5=10$$

- In a F_2 population of Sorghum, the breeder observed 603 tall plants and 217 dwarf plants. Comment on the observed result with χ^2 analysis. (Note: The chi-square value is 3.841 for 1 degree of freedom at 0.05 probability level). 10
- Briefly mention the role of polyploidy in crop improvement. Explain the Vavilov's concept of centres of origin of cultivated plants. $5+5$