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PG (Agriculture)
M.SC. Semester- III Examination, 2023
GENETICS AND PLANT BREEDING
PAPER: AST 101
(STATISTICAL METHODS FOR APPLIED SCIENCES)

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: 2×5=10

   a) Define statistics and its limitations.
   b) What is the relationship between mean, median and mode?
   c) What do you mean by relative frequency and cumulative frequency.
   d) Define Random experiment with example.
   e) What do you mean by random variable? Classify it.
   f) Write about the difference of CV and CD.
   g) What is ANOVA?
   h) Define Probability Density Function. Write the Probability Density Function (PDF) of Normal distribution.

GROUP-B

2. Answer any **FOUR** of the following questions: 5×4=20

   a) Differentiate between classification and tabulation of data. Explain the applications of Chi-square test.   3+2
   b) Explain F-test along with its Null and Alternate hypothesis, Test statistic, Degrees of freedom and Applications.
   c) There are two cricket teams A and B. For team A: Mean = 23; Standard deviation = 3 and for team B: Mean = 30; Standard deviation = 5. Find out which team is more consistent?
   d) Find out the mean, median and mode of the following frequency distribution:

Class	0-5	5-10	10-15	15-20
Frequency	2	5	4	1

   e) Compare the Binomial and Poisson distributions.

f) Calculate the correlation coefficient and determine the regression lines of y on x and x on y for the sample

x	8	10	5	8	9
y	1	3	1	2	3

GROUP-C

3. Answer any **TWO** of the following questions: 10×2=20

   a) Discuss on merits and demerits of non-parametric tests. The weights of 8 ear heads of sorghum are 14, 29, 9, 15, 20, 17, 12, and 11. Find Standard Deviation and Variance and coefficient of variation.

   b) Compute t-test for the data given below

Group A	10	4	3	2	4	2	5	10	5	5
Group B:	4	6	8	2	9	1	12	13	10	100

   Critical value: 2.10 at 5% level of significance

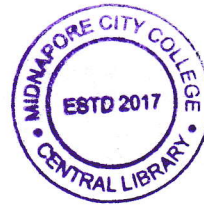   Find if there is a significance difference between the mean of Group A and B.

   c) The following figures relate to the number of units of an item produced per shift by two workers A and B for a number of days

A:	19	22	24	27	24	18	20	19	25		
B:	26	37	40	35	30	30	40	26	30	35	45

   Can it be inferred that worker A is more stable compared to worker B? Answer using the F-test at 5 % level of significance (critical value: $F_{0.05}=3.5$).

   d) Briefly explain any four of the followings: 2.5×4
   - I. Principal Component analysis
   - II. Box-plot
   - III. Standard deviation
   - IV. Cluster analysis
   - V. Standard error
   - VI. Poisson Distribution

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