

B. Sc. (Honours) Agriculture Semester-V Examination, 2025
Subject: Statistical Methods (STAT 311)

Roll No. (in figure)..... (in words).....
Student Index No.....Reg. No.of.....

Time: 2 hours

Full marks: 50

Questions are of value as indicated in the margin

Part-I

(Objective and Short Answer Type)

Time: 30 minutes

Marks: 20

Note: 1. Answer in question paper itself (No additional sheet will be provided)
 2. Striking, rewriting or overwriting are not allowed in the objective type questions.

1. Choose the correct answer and put tick mark (✓): **(1×5 = 5)**

- i) Degrees of freedom for Paired t-test is: a. (n-1) b. (n-2) c. n d. 1
- ii) The unit of coefficient of variation is:
 a. same as variable b. same as variance c. unit free d. square of unit of variable
- iii) If $u + 3x = 5$, $2y - v = 7$ and correlation coefficient of x and y is 0.12, correlation coefficient of u and v will be?
 a. 0.6 b. 0.12 c. - 0.12 d. None of these
- iv) Pearson Correlation is study of
 a. Linear relationship b. Direction of relationship c. Strength of relationship d. All of the above
- v. Degrees of freedom for 2x2 chi-square contingency table
 a. 4 b. 2 c. 1 d. 0

2. Fill in the blanks with suitable word (s): **(1×5 = 5)**

- i. Given the observation 0, - 1, 1, - 2, 2 median is _____.
- ii. Central tendency which is affected highly by extreme values is _____.
- iii. Variance of 4, 5, 6, 7, 8 will be _____.
- iv. For a positively skewed distribution, _____ is highest among mean, median and Mode.
- v. Individual are not similar in the population is known as _____.

3. Answer any five questions: **(2×5 = 10)**

- i. For $X \sim B(10, 0.4)$, find $P(X=2)$.
- ii. Differentiate between sampling and census.
- iii. Explain multiplication theorem of probability and independent events.
- iv. Scatter diagrams for correlation study.
- v. What is a statistical hypothesis? What are its types?
- vi. What is Simple Random Sampling?
- vii. What is box plot? What is its importance in statistics?
- viii. What is standard deviation and its applications?

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Part-II
(Descriptive Type)

Time: 1 hour 30 minutes

Marks: 30

Questions are of value as indicated in the margin

Answer any three of the following questions

4. a. Discuss different methods of collecting data. What are primary and secondary data?
b. Define data and discuss its uses.
c. What are trimmed mean and treaming percentage? State why trimmed mean is used in statistics?
4+2+4=10
5. a. Define sample space and event related to random experiment. State the classical definition of probability
b. What is the probability of having 53 Sundays in a leap year?
c. For $X \sim P(0.05)$, what is $P(X \leq 1)$?
3+4+3=10
6. a. What are the parameter and statistic in the context of hypothesis testing.
b. What are the steps of hypothesis testing?
b. Write the detailed procedure of Student's t-test within independent sample observation drawn from normal population with mean μ and variance σ^2 .
c. Write note on chi-square test for independence of attributes.
3+4+3=10
7. a. Show using example that Pearson Correlation measures only the linear relationship between two correlated variables x and y.
b. State different properties of regression coefficients.
5+5=10
8. Write short notes on (*any four*):
2.5×4 = 10
- i. Given the two lines of regression as $3x-4y+8=0$ and $4x-3y=1$, find the means of x and y.
ii. If the two lines of regression are $x+2y-5=0$ and $2x+3y-8=0$, identify the regression line of y on x.
iii. Do the data support the assertion that prevalence of TB in slum area is more than normal area in following data [Given $X^2, (0.05)=3.84$]
- | | | | |
|-------------|-----|-------|------|
| | TB | No TB | |
| Normal Area | 28 | 572 | 600 |
| Slum Area | 96 | 304 | 400 |
| | 124 | 876 | 1000 |
- iv. Explain the procedure of analyzing one-way ANOVA.
v. What are different measures of dispersion? Give three relative measures of dispersion and state why relative measures useful in statistics.

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