

Signature of Centre Superintendent

B. Sc. (Honours) Agriculture Semester-V Examination, 2024  
Subject: Statistical Methods (STAT-311)

Roll No. (in figure)..... (in words).....

Student's index No.....Registration 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

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)

- a) First moment about mean gives  
a. mean  
b. variance  
c. standard deviation  
d. zero
- b) A complete list of all the units in the population is known as  
a. population frame  
b. sampling frame  
c. population list  
d. sample list
- c) Binomial distribution is positively skewed if  
a.  $p > 0.5$   
b.  $p < 0.5$   
c.  $q = 0.5$   
d.  $p = 0.5$
- d) A test is one-sided or two-sided that depends on  
a. null hypothesis  
b. alternative hypothesis  
c. composite hypothesis  
d. simple hypothesis
- e) In the regression line  $\hat{Y} = \alpha + \beta X$ ,  $\beta$  is called the  
a. slope of the line  
b. intercept of the line  
c. either (a) or (b)  
d. cannot be interpreted

2. Fill in the blanks

(1 × 5 = 5)

- a) Repeated application of the treatments is known as \_\_\_\_\_
- b) Degrees of freedom for Fisher's  $t$ -test for two independent samples of size  $n_1$  and  $n_2$  are \_\_\_\_\_
- c) Paired  $t$ -test is used when observations are \_\_\_\_\_
- d) The 3<sup>rd</sup> order central moment of a Poisson distribution is 9, then CV will be \_\_\_\_\_
- e) Correct relationship between A.M., G.M., and H.M. is \_\_\_\_\_

3. Write short notes on any five questions

(2 × 5 = 10)

- a) Exhaustive & Mutually exclusive events.
- b) Types of correlation with examples.
- c)  $X \sim \text{Bin}(5, 0.4)$ , find  $P(X=3)$ .
- d) What are types of Errors? Which error is more serious?
- e) What is ANOVA and its assumptions?
- f) Differentiate between Parameter and Statistic.
- g) What is a box plot? What is five number summary in statistics?
- h) Calculate the variance for the following observations: 26, 19, 32, 30, 18, 27, 22, 29, 33, 20.

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Part-II

(Descriptive Type)

Time: 90 minutes

Marks: 30

Questions are of value as indicated in the margin

Answer any three of the following questions

4. What are the steps of hypothesis testing? Write the detailed procedure of Student's  $t$ -test. (5+5=10)
5. Compare mean, median and mode as a measure of central tendency. (10)
6. Write about simple linear regression. Explain the properties of two regression coefficients ( $b_{yx}$  and  $b_{xy}$ ). (3+7=10)
7. What are the different absolute measures of dispersion? Also state the corresponding relative measures of dispersion. <sup>at</sup> State why the concept of relative measures of dispersion has introduced. (5+5=10)
8. Let  $X$  be a random variable having  $p.m.f.$

$$p(x) = \begin{cases} \binom{10}{x} \left(\frac{2}{5}\right)^x \left(\frac{3}{5}\right)^{10-x}, & x = 0, 1, \dots, 10 \\ 0, & \text{otherwise} \end{cases}$$

Find mean, variance and the maximum value of the variance. (10)

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