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 typequestions.

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 $Y = \alpha + \beta X$, β 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 3rd 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) $X \sim Bin(5, 0.4)$, 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.

B. Sc. (Honours) Agriculture Semester-V Examination, 2024
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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. Ste at why the concept of relative measures of dispersion has introduced.

$$(5+5=10)$$

8. Let X be a random variable having *p.m.f.*

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

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

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Palli Siksha Bhavana (Institute of Agriculture)
B. Sc. (Honours) Agriculture Semester-VI Examination, 2024
Subject: Design in Agricultural Experiment (STAT-321)

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

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 extra page will be provided)*
           2. Striking, rewriting or over writing are not allowed in the objective type questions.

1. Select appropriate answer from the following alternatives: (1×5 = 5)

a) Local control is not applicable in
   (i) LSD   (ii) RBD   (iii) Both (i) & (ii)   (iv) none of these

b) Two-way elimination of heterogeneity is achieved in
   (i) CRD   (ii) RBD   (iii) LSD   (iv) none of these

c) Standard error of difference in treatment means in RBD is
   (i) EMS/r   (ii) 2EMS/r   (iii) $\sqrt{(2EMS/r)}$ (iv) none of these

d) Consider a Latin square design with 5 treatments, then the error degrees of freedom in ANOVA is
   (i) 10   (ii) 12   (iii) 17   (iv) 13

e) Randomization is used in design of experiment
   (i) to reduce human bias   (ii) to ensure independence of observation
   (iii) Both (i) & (ii)   (iv) none of these

2. Fill in the blanks with suitable answer: (1×5 = 5)

a) Replication in design of experiments gives us an estimate of ....

b) In split plot design, main plot effects are estimated with .... precision.

c) Consider a split plot design with 4 replications, factor A and B having 3 levels each, then the sub-plot error degrees of freedom is ....

d) In RBD, critical difference is calculated by..

e) The error degrees of freedom in 2^3 factorial RBD with 3 replication is.............................

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

a) What is Analysis of Variance?
b) What do you mean by factorial experiment?
c) Define asymmetrical factorial experiment with example.
d) Give example of agricultural experiments where split plot and strip plot design is applied.
e) Write a short note on uniformity trial.
f) Write the ANOVA table of strip plot design.
g) Write difference between CRD, RBD and LSD.
h) Define least significant difference.

Visva-Bharati
Palli Siksha Bhavana (Institute of Agriculture)
B. Sc. (Honours) Agriculture Semester-VI Examination, 2024
Subject: Design in Agricultural Experiment (STAT-321)
(Descriptive Type)

Time: 1½ hours

Marks: 30

Questions are of value as indicated in the margin
Answer *any three* of the following questions

4. Describe in details the basic principles of design of experiments. Write the layout of Latin Square Design with five treatments. Write the advantages and disadvantages of factorial experiment.

[5+3+2=10]

5. Define simple effect, main effect and interaction effect in factorial experiment. What do you mean by confounding in factorial experiment? Write the advantages and disadvantages of confounding. Differentiate between complete cofounding and partial confounding.

[3+2+3+2=10]

6. Write the Yate's algorithm in 2^3 factorial experiment to obtain the factorial effects. Suppose a 2^3 factorial experiment is conducted in RBD with 'r' replications. Write the ANOVA table.

[7+3=10]

7. Differentiate between split plot and strip plot design. Describe in detail the layout and analysis of split plot design.

[2+8=10]

8. What do you mean by missing plot technique in design of experiments. Obtain the estimate of single missing value in a randomized block design using missing plot technique.

[2+8=10]