

M.Sc. (Ag.) Examination, 2019
Semester – II
Agricultural Economics and Agricultural Statistics
Course: STAT 551
(Experimental Designs)

Time: Three Hours

Full Marks: 50

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

1. Define Block, Treatment, Experimental Material, Experimental Unit and Critical Difference. 10
2. Suppose you have four treatments A, B, C and D with three replications. Prepare a layout and explain the statistical procedure for analyzing the data under a Completely Randomized design. 10
3. For 2^2 – factorial experiment 10
 - (a) Define simple effects
 - (b) Define main effects
 - (c) Prove that the main effect A and interaction B are orthogonal contrast
 - (d) Prove that the main effect A and interaction AB are orthogonal contrast
 - (e) Prove that the main effect B and interaction AB are orthogonal contrast
4. Suppose we have two factors; variety (V) with v_1, v_2 levels and dose of Nitrogen (N) with n_0, n_1 levels. Given the values of their combination $v_1n_0=30, v_1n_1=38, v_2n_0=35, v_2n_1=45$. From the following information, explain Simple effects, Main effects and Interaction. 10
5. Explain the difference between Split, Split-Split and Strip Plot designs with the help of their layout. 10
6. What do you understand by strip plot design? Write down the complete analysis of this design 3+7=10
7. (a) Define the term ‘response’. Explain physical and economic optimum solution for one independent variable. 5+5=10
(b) The equation of a response curve giving relation between output factor Y and input factor X is
$$Y = 10.24 + 40.5 X - 27.5X^2$$
Determine the physical optimum value of X. If the price of Y is Rs. 6/- per unit and cost of X is Rs/- 21 per unit, find economic optimum value of X.
8. Write short notes on (**any two**): 2×5=10
 - a) ANCOVA.
 - b) ANOVA.
 - c) Explain models for CRD, RBD and LSD