

**M.Sc. (Ag.) Examination, 2018**  
**Semester-II**  
**Agricultural Economics and Agricultural Statistics**  
**Paper/Course- STAT-551**  
**(Experimental Designs)**

**Time: 3 Hours**

**Full Mark: 50**

**Questions are of value as indicated in the margin**

**Answer *any five* questions**

1. Explain basic principles of design of experiments. Discuss and define experimental error. 6+4=10
2. Explain the statistical procedure for Randomized Block design. What is the use of critical difference analysis? 7+3=10
3. Define a factorial experiment. What is the difference between a symmetrical factorial and asymmetrical factorial experiments? Write a factorial combination in lexicographic order for  $2^4$  factorial experiments. 2+3+5=10
4. Define main effect and interaction effects in a  $2^2$ -factorial experiment. What are the advantages of a factorial experiment over a single factor experiment? Give Yates' algorithm for the analysis of  $2^3$ -factorial experiment. 3+3+4=10
5. What do you mean by split-plot design? '*The treatments in sub-plots get more importance than treatments in main plots*'- Justify the statement. What are the advantages and disadvantages of split plot design? 4+2+4=10
6. When and why do you recommend a strip plot design? Write down the complete analysis of this design. 3+7=10
7. The equation of response curve giving relation between output factor Y and input factor X is

$$Y = 4207 + 138.42 X - 3.39 X^2$$

Determine the physical optimum value of X. If the price of Y is Rs. 8/- per unit and cost of X is Rs/- 22 per unit, find economic optimum value of X and Y. 4+6=10

8. Write short notes on (*any two*):
  - a) Analysis of covariance.
  - b) Uniformity trial.
  - c) What is missing plot technique in RBD.
  - d) Write five differences between CRD, RBD and LSD. 2×5=10