

16P256

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Name.....

Reg No:.....

SECOND SEMESTER M.Sc. DEGREE EXAMINATION, MAY-2017

(Regular/Supplementary/Improvement)

(CUCSS - PG)

CC15P ST2 C09 - DESIGN AND ANALYSIS OF EXPERIMENTS

(Statistics)

(2015 Admission Onwards)

Time: Three Hours

Maximum: 36 Weightage

PART A

(Answer **all** questions. Weightage 1 for each question.)

1. What do you mean by p -value in hypothesis testing?
2. Distinguish between fixed effects and random effects model.
3. Write a short note on Kruskal-Wallis test.
4. Explain one situation in which analysis of covariance is used.
5. Derive the expression of efficiency of Randomized Block Design over Completely Randomized Design.
6. Explain how the basic principles of design of experiment are employed in Latin Square Design.
7. Define BIBD. What are the relations satisfied by the parameters of a BIBD.
8. Write a short note on Lattice design.
9. State main parametric relations in PBIBD.
10. Distinguish between partial and complete confounding.
11. Define the terms main effects and interaction effects of a factorial design.
12. Explain Yates procedure for finding sum of squares in a 2^2 factorial experiment.

(12x1=12 weightage)

PART B

(Answer **any eight** questions. Weightage 2 for each question.)

13. What is meant by analysis of variance technique? Discuss assumptions for the validity of this technique.
14. Establish by an example the best estimates of orthogonal parametric functions need not be orthogonal.
15. Describe the analysis of a single factor fixed effects model.
16. If a single observation is missing in Graeco Latin Square Design, estimate the missing value.

17. Obtain an expression for the efficiency of Latin Square Design relative to Completely Randomized Design.
18. Explain the analysis of a Completely Randomized Design.
19. State and prove Fisher's inequality.
20. Construct a BIBD with the parameters $v = 7, b = 7, r = 3, k = 3, \lambda = 1$.
21. Explain the analysis of a Youden square.
22. Construct a 2^5 design in blocks of 8 plots confounding ABC, ADE and $BCDE$.
23. Define split plot design and briefly describe its analysis.
24. Construct a $\frac{1}{2}$ replicate of 2^4 factorial design and sketch its analysis.

(8x2=16 weightage)

PART C

(Answer any two questions. Weightage 4 for each question.)

25. Explain how the normal equations enable us to determine the class of all estimable functions and their best estimates.
26. Describe the analysis of Randomized Block Design with a single concomitant variable.
27. Describe the intrablock analysis of BIBD.
28. In a 2^5 factorial experiment with factors A, B, C, D and E the principal block of a confounding system is given by $\{(1), acd, bce, abde\}$. Obtain other blocks of the confounded arrangement. List out all interaction effects which get confounded into the blocks.

(2x4=8 weightage)
