18P266 (Pages: 2) Name:……..

Reg. No:……..

SECOND SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2019

(Regular/Improvement/Supplementary)

(CUCSS - PG)

CC15P ST2 C09 - DESIGN AND ANALYSIS OF EXPERIMENTS

(Statistics)

(2015 Admission onwards)

Time: 3 Hours Maximum: 36 Weightage

PART A

Answer ***all*** questions. Each question carries 1 weightage.

1. Explain the role of randomization and replication in design of experiments.
2. When do you say that a parametric function is estimable?
3. Define linear hypothesis.
4. Give an example plan of Graeco Latin Square Design.
5. Explain the situation in which Analysis of Covariance is used.
6. Derive the expression for efficiency of Latin Square Design over Randomized Block Design.
7. State four important parametric relations in Balanced Incomplete Block Design.
8. Define partially balanced incomplete block design with two associate classes.
9. Write a short note on Lattice design.
10. Obtain the main effects and interaction effects of a 2^2 factorial design.
11. Distinguish between complete confounding and partial confounding.
12. Explain the concept of fractional factorial.

(12 × 1 = 12 Weightage)

PART B

Answer any ***eight*** questions. Each question carries 2 weightage.

13. Discuss the regression approach to the analysis of variance.
14. Derive the expression for the expected value of the mean squares in Randomized Block Design.
15. Write a short note on model adequacy checking.
16. If a single observation is missing in Latin square design, estimate the missing value.
17. Describe the analysis of Randomized Block Design with a single concomitant variable.
18. Construct a complete set of mutually orthogonal Latin squares of side 3

19. Explain the analysis of a Youden square.
20. Construct a BIBD with $v=16, b=20, k=4, r=5$ and $\lambda=1$
21. State and prove the parametric relations in PBIBD.
22. Explain the analysis of a split plot design.
23. Analyse the 2^3 factorial design with ANOVA table.
24. Describe the Yates procedure of obtaining the main and interaction effects of a 2^n factorial experiment.

(8 × 2 = 16 Weightage)

PART C

Answer any ***two*** questions**.** Each question carries 4 weightage.

25. If Y_1, Y_2, Y_3, Y_4 are independent random variables with common variance σ^2 and $E(Y_1)=E(Y_2)=\theta_1+\theta_2$ and $E(Y_3)=E(Y_4)=\theta_1+\theta_3$. Show that $\theta_1+\theta_2$ and $2\theta_1+\theta_2+\theta_3$ are estimable. Find their best estimates.
26. Write down the model and explain in detail the analysis of a design in which no local control is used.
27. Distinguish between intra block and inter block analysis of BIBD.
28. Explain the analysis of a 3^2 factorial experiment with r replications.

(2 × 4 = 8 Weightage)

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