K20U 0153

Reg. No. : .....

Name : .....

VI Semester B.Sc. Degree (CBCSS-Reg./Supple./Improv.) Examination, April 2020
(2014 Admission Onwards)
Core Course in Statistics
6B12STA : DESIGN OF EXPERIMENTS

Time : 3 Hours Max. Marks : 48

PART – A
Short Answer

Answer **all** the **6** questions. **(6×1=6)**

1. Define a linear parametric function and a linear estimate.
2. What do you mean by auxiliary variable ?
3. Define two way classified data.
4. Write down the mathematical model for a one way classified data.
5. What do you mean by degrees of freedom ?
6. What is the main advantage of factorial experiments ?

PART – B
Short Essay

Answer **any 7** questions. **(7×2=14)**

7. Explain Gauss Markov linear model.
8. Define best linear unbiased estimate.
9. Write a short note on analysis of Covariance.
10. Give the ANOVA table for a two way classified data.
11. Explain the terms 'experimental units' and 'experimental error'.

P.T.O.

12. What are the basic assumptions of analysis of variance ?

13. Write down the advantages and disadvantages of Latin square design.

14. For a 4×4 Latin square design, write down the degrees of freedom for row, column, treatment and error sums of squares.

15. Give the relative efficiency of Randomized block design over completely randomized design.

PART – C
Essay

Answer **any 4** questions. **(4×4=16)**

16. Consider the model $y_i = \mu + \alpha_i + e_i$, i = 1, 2, 3. Show that μ is not estimable.

17. Explain the decomposition of total sum of squares into sum of squares due to treatment and error in the case of one way classified data.

18. Write down the model of two way classified data and explain the estimation of parameters by least squares method.

19. Derive the expression for one missing observation in Latin square design.

20. Conduct the analysis of variance for a completely randomized design.

21. Explain the layout of a Greaco-Latin square design.

PART – D
Long Essay

Answer **any 2** questions. **(2×6=12)**

22. Show that the best estimates of orthogonal parametric functions need not be orthogonal.

23. Describe the analysis of randomized block design.

24. Explain the basic principles of experimentation.

25. Define main effects and interaction effects. Derive the main effects and interaction effects of a 2^2 factorial experiment.

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