B.Sc. DEGREE END SEMESTER EXAMINATION - OCTOBER/NOVEMBER 2018

SEMESTER –5: STATISTICS FOR B.Sc. COMPUTER APPLICATIONS

COURSE: **U5CRCST6: DESIGN OF EXPERIMENTS**

(For Supplementary - 2014 admission)

Time: Three Hours   Max. Marks: 75

Use of Non-programmable calculator and Statistical Tables allowed

PART A

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

1. How do you define a contrast?
2. What do you mean by the experimental material?
3. Define Best Linear Unbiased Estimate.
4. Give an example of a layout of LSD.
5. When do you say that a linear parametric function is estimable?
6. Give the error degrees of freedom in a CRD with 'n' experimental
7. What is meant by replication?
8. What do you mean by the statement 'treatment effects are significant' in ANOVA?
9. Give the formula for estimating one missing value in RBD having b blocks and k treatments with usual notation
10. Differentiate between fixed and random effect models.   (1 x 10 = 10)

PART B

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

11. State Gauss-Markov theorem.
12. Explain critical difference.
13. Describe the statistical model for randomized block design with 'n' observations per experimental unit.
14. Find the relative efficiency of design 1 with respect to design 2, if their error variances are σ_1^2 and σ_2^2 respectively.
15. Elucidate the assumptions made while using ANOVA?
16. Describe the factors affecting the efficiency of a design.
17. What is meant by linear estimation?
18. In LSD with 4 treatments and error sum of squares 156, find the mean error sum of squares.
19. What do you mean by CRD?
20. Distinguish between symmetric and asymmetric factorial experiments   (2 x 8 = 16)

PART C

*Answer **any five** questions. Each question carries **5** marks.*

21. What do you understand by local control? Explain its role in design of experiments.
22. What are the advantages and disadvantages of CRD?
23. Derive the expression for computing one missing value in Latin Square Design.

24. Explain what is meant by main effects and interactions in factorial experiments.
25. Obtain the efficiency of LSD over corresponding RBD when (i) rows of LSD are used as blocks of RBD and (ii) columns of LSD are used as blocks of RBD, from the following information of a 4×4 LSD.

    Total S.S. =1943　　　　Row S.S. =259

    Column S.S. = 155　　　　Treatment S.S. = 1372

26. Explain briefly about the fundamental principles of design of experiments
27. Explain the various steps involved in Yates' method of computing factorial effect totals

(5 x 5 = 25)

PART D

*Answer **any two** questions. Each question carries **12** marks.*

28. The yield per plant of five varieties in RBD are given:

Variety	Rep. I	Rep. II	Rep. III
V_1	21.0	20.0	19.5
V_2	19.0	18.0	18.5
V_3	31.5	30.5	32.0
V_4	27.5	...	28.0
V_5	25.0	25.3	26.6

Analyse the data having one missing value and interpret the result.

29. Find out the main effects and interactions in the following 2^2 factorial experiment and write down the analysis of variance table.

	(1) 00	a 10	b 01	ab 11
Block I	64	25	30	6
Block II	75	14	50	33
Block III	76	12	41	17
Block IV	75	33	25	10

30. Explain the analysis of 2^n factorial experiment by clearly specifying the main effects and interaction effects.
31. Briefly explain the missing plot techniques in LSD

    b) Fill in the missing entries in the following ANOVA table of an LSD.

Source	d.f	S.S	M.S.S.	F ratio
Treatment	?	?	?	?
Row	?	?	50	2.00
Column	?	300	?	?
Error	20	?	?	*
Total	?	?	*	*

(12 x 2 = 24)