LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – DATA SCIENCE

FOURTH SEMESTER – APRIL 2022

PDS 4604 – DESIGN OF EXPERIMENTS

Date: 17-06-2022   Dept. No.   Max. : 100 Marks
Time: 01:00 PM - 04:00 PM

PART – A

Q. No   **Answer ALL Questions**   **(10x 2 = 20 Marks)**

1   State the principles of Design of Experiments.

2   State any two advantages of randomization in an experiment.

3   State any two applications of ANOVA.

4   What are the sources of variation in a two-way classification?

5   Differentiate any two points between ANOVA and ANCOVA.

6   State the assumptions of ANCOVA.

7   What is variability between the classes?

8   State any two applications of RBD.

9   Define confounding.

10   State any two advantages of factorial experiments.

PART – B

Answer any ALL Questions   **(5 x 8 = 40 Marks)**

11 a.   What are the main sources of experimental error? Explain the methods of reducing the experimental errors.

(OR)

b.   Define the terms (i) Treatment (ii) degrees of freedom (iii) critical region (iv) Experimental unit (v) Experimental material.

12 a.   Write the procedure of solving a Two way ANOVA.

(OR)

b.   Carry out the analysis of the following and draw your conclusion

A	23	26	13	17	47	33			
B	30	24	31	30					
C	15	18	26	21	15				

13 a.   Write the layout of the two-way ANCOVA.

(OR)

b.   Differentiate between ANOVA, ANCOVA and factorial Experiments.

14 a.   Write the procedure of performing a Latin square design.

(OR)

b. In the table given below are the yields of 4 varieties of seeds in 4 blocks. Analyze the significance of varieties and Blocks.

Varieties	Blocks			
	1	2	3	4
1	15	10	8	7
2	12	9	7	5
3	10	7	6	4

15 a. Form the Yate's table of 2^3 factorial design.

(OR)

b. Give the complete analysis of 2^2 experiment in CRD.

PART – C

Answer any TWO Questions   **(2x 20 = 40 Marks)**

16 a. Explain in detail the Transformation of data and its uses with example.

b. Estimate the missing values in the following RBD layout by Yates's method.

Treatments	Blocks		
	I	II	III
A	12	14	12
B	10	-	8
C	-	15	10

17a. Write the procedure of solving one way ANCOVA.

b. Derive the formula to estimate one missing values in LSD by Yate's method.

18a. Consider a 2^3 factorial design in two blocks as follwos. Analyse the data and draw the conclusion.

	abc	ab	ac	bc	a	b	c	(1)
Block 1	12	13	11	14	12	11	14	13
Block 2	12	12	11	12	10	12	11	12

b. Explain in detail about confounding in 2^2 factorial Design.

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