



Date: 16-11-2024

Dept. No.

Max. : 100 Marks

Time: 01:00 pm-04:00 pm

SECTION A - K1 (CO1)

Answer ALL the Questions

(10 x 1 = 10)

1. **Define the following**

- a) Randomization.
- b) Standard Latin square design.
- c) Confounding.
- d) BIBD.
- e) Incidence matrix.

2. **Fill in the blanks**

- a) Experimental design methods are not used _____.
- b) In Latin Square design, the number of rows, columns and treatments are always _____.
- c) In CRD, _____ observations are deleted.
- d) Analysis of variance is a statistical method of comparing the _____ of several populations.
- e) A 2X2 Factorial design contains _____ factors.

SECTION A - K2 (CO1)

Answer ALL the Questions

(10 x 1 = 10)

3. **Multiple Choice Questions**

- a) What is the purpose of blocking in experimental design?
 - a) To reduce the variability within treatment groups
 - b) To control for confounding variables
 - c) To ensure a balanced representation of different treatments
 - d) To increase the sample size of the experiment.
- b) The method of confounding is a device to reduce the size of
 - a) experiments b) replications c) blocks d) All of these.
- c) In a $k \times k$ Latin square, the error d.f. in ANOVA is
 - a. (k^2-2)
 - b. k^2-k-2
 - c. $k(k-1)(k-2)$
 - d. $(k-1)(k-2)$
- d) In a factorial experiment, how would an interaction be indicated in a line graph?
 - a. As parallel lines
 - b. As intersecting lines
 - c. As overlapping lines
 - d. As diagonal lines
- e) In the experiment, the missing values can be estimated by the method of,

	a. ANCOVA	b) Minimizing the MSE	c) Both a and b	d) Neither a nor b
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4.	Answer the following
a)	What are mutually orthogonal contrasts?
b)	What is the difference between random effect model and fixed effect model? Give an example.
c)	State any one of the Local Control techniques.
d)	Write any one application of factorial experiment.
e)	How to construct the mutually orthogonal Latin square design?

SECTION B - K3 (CO2)

	Answer any TWO of the following	(2 x 10 = 20)
5.	Write the advantages and disadvantages of CRD.	
6.	Explain two-way classification model.	
7.	Estimate one missing value in LSD.	
8.	Obtain the expression for the efficiency of LSD over RBD.	

SECTION C – K4 (CO3)

	Answer any TWO of the following	(2 x 10 = 20)
9.	Derive the Statistical analysis of 2^2 Factorial Design.	
10.	Explain the various methods to test the pairwise treatment combinations.	
11.	Establish the parametric conditions of BIBD.	
12.	Construct balanced incomplete block design using Mutually orthogonal Latin square design when $s=4$.	

SECTION D – K5 (CO4)

	Answer any ONE of the following	(1 x 20 = 20)
13.	(a) What are the basic principles of experimental design? Explain with examples. (b) Derive the Statistical analysis of One-way classification.	
14.	Explain the concept and analysis of LSD with a layout.	

SECTION E – K6 (CO5)

	Answer any ONE of the following	(1 x 20 = 20)
15.	(a) Explain the types of confounding. (b) Write the Statistical analysis of 2^3 Factorial Design.	
16.	Discuss in detail the intra-block analysis of BIBD.	

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