

Printed Pages : 2



ECH-023

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 151656

Roll No.

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B. Tech.

(SEM. VI) THEORY EXAMINATION, 2014-15
STATISTICAL DESIGN OF EXPERIMENTS

Time : 2 Hours]

[Total Marks : 50

Note: 1. Attempt ALL questions.
 2. Assume suitable data, if required.

1. Attempt any FOUR parts of the following: - 3×4
- Describe the basic principles & guidelines for designing experiments.
 - Discuss the fundamental of design of experiment. Also explain 'Randomized blocks' with suitable examples.
 - Define 'Fractional factorial design' with suitable example.
 - Describe the term 'Non linear regression' with suitable examples.
 - Discuss the types of 'design of experiments' with suitable example.
 - Discuss the basic 'concept of sampling distribution' with suitable example.

2. Attempt any TWO parts of the following: - 7×2
- (a) Solve the following Linear Programming Problem using simplex method:-
Max. $Z = 3x_1 + 5x_2 + 4x_3$ Subject to $2x_1 + 3x_2 \leq 8$,
 $3x_1 + 2x_2 + 4x_3 \leq 15$, $2x_2 + 5x_3 \leq 10$ and $x_1, x_2, x_3 \geq 0$
- (b) Discuss the method of hypothesis testing in multiple regressions, with suitable examples.
- (c) Write a short note on 'Model adequacy analysis' with suitable examples.
3. Attempt any TWO parts of the following: - 6×2
- (a) What do you mean by linear regression? Discuss the procedure for parameter estimation in linear regression model. Explain with suitable examples.
- (b) Give the detail procedure of the analysis of variance and mean, with suitable mathematical example.
- (c) Define random effect model. How will you determine the sample size with random effects? Explain with suitable examples.
4. Write short notes on any FOUR parts of the following: 3×4
- (a) Paired comparison design
(b) Steepest ascent method
(c) 2^k factorial design
(d) Split plot design
(e) Box-Behnken design
(f) Chi-squared test.
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