Printed Pages : 2

ECH-023

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

PAPER ID : 151656

Roll No. | | | | | | | | | | |

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
   (a) Describe the basic principles & guidelines for designing experiments.
   (b) Discuss the fundamental of design of experiment. Also explain `Randomized blocks' with suitable examples.
   (c) Define `Fractional factorial design' with suitable example.
   (d) Describe the term `Non linear regression' with suitable examples.
   (e) Discuss the types of `design of experiments' with suitable example.
   (f) 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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