Reg. No. :

Question Paper Code: 92015

M.E. DEGREE EXAMINATION, MAY 2014.

Elective

CAD / CAM

01PCD522 – DESIGN AND ANALYSIS OF EXPERIMENTS

(Regulation 2013)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Define Variability.

2. Develop the procedure to test the general linear hypothesis based on a linear model, stating clearly the assumptions.

3. Obtain relative efficiency of Randomized Block Design in comparison to Completely Randomized Design.

4. Define Graceo latin square design.

5. Narrate the advantages of full factorial experiments.

6. State the concept of confounding in factorial experiments.

7. What is split plot design?

8. Give the use of response surface designs.

9. Write down the use of Taguchi experimental design.

10. Define Signal to Noise ratio.

PART - B (5 x 14 = 70 Marks)

11. (a) Describe the components of experimental design with suitable example.   (14)

(b) (i) Explain the various steps involved in experiment design process. (7)

(ii) Discuss the linear regression model in detail. (7)

12. (a) Describe the analysis of a completely Randomized Design with k observations per cell. (14)

(b) Develop the analysis of covariance for randomized block design with one Co - commitant variable, stating clearly the assumptions. (14)

13. (a) Briefly explain the confounding and blocking in 2^k Factorial Designs. (14)

(b) In the case of two associate class PBIBD, define the parameters and develop the intra-block analysis using a suitable model. (14)

14. (a) (i) Analyse the fractional factorial design with an example. (6)

(ii) How to choose the split - plot design and explain. (8)

(b) Describe the rules for determining the expected mean square. (14)

15. (a) (i) Illustrate the applications of orthogonal arrays. (7)

(ii) Discuss about various controllable and noise factors. (7)

(b) (i) Distinguish between static and dynamic quality characteristics. (4)

(ii) Describe the basic probability and statistical concepts and their applications in analyzing data about products, customers, services and processes. (10)

PART - C (1 x 10 = 10 Marks)

16. (a) Construct a 2^5 design in blocks of 8 plots confounding ABC, ADE and BCDE. Give the analysis of such a design with r replications. (10)

(b) Justify that the pair wise comparison tests plays a significant role in single factor experiments. (10)

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