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Subject Code: 710906 N

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER I (OLD) - • EXAMINATION - SUMMER 2016

Date: 21/05/2016

Tir	ne: 2	Name: ROBUST DESIGN :30 pm to 5:00 pm Total Marks:	70
Inst	1. 2. 3.	Attempt all questions. Make suitable assumptions wherever necessary.	
Q.1	(a) (b)	Explain the term 'Robust Design' with a suitable example Explain the procedure for establishing the main and interactive effects of two factors, say A and B, having two levels replicated once.	07 07
Q.2	(a) (b)	Explain the "Randomized Complete Block Design" citing one suitable example. What are the three stages of design developed by Taguchi for product development and explain any one of them giving a suitable example. OR	07 07
	(b)	Explain the terms (i) inner array (ii) outer array (iii) crossed array design (iv) signal-to-noise ratio. With the help of graphs explain the role of control X noise interaction in robust design.	07
Q.3	(a)	Explain the following terms citing suitable examples:	07
	(b)	(i) full factorial design (ii) one-half factorial design. Write down the one half fraction of the 23 factorial design taking ABC as the generator. What you mean by aliases? Write down all the aliases of the 2 ³⁻¹ fractional design.	07
		OR	
Q.3	(a) (b)	Explain the concept of Robust Response Surface Design and Analysis. Explain the concept of Design for Six Sigma.	07 07
Q.4	(a) (b)	Explain Blocking and Confounding in 2 ^k design. Explain split-plot design and nested design giving one appropriate example. OR	07 07
Q.4	(a) (b)	Explain the meaning and significance of each entity of ANOVA table. What is loss function? With the help of suitable examples explain the following loss functions with regards to Taguchi philosophy: (i)Nominal is the best (ii) lower is better (iii) higher is better	07 07
Q.5	(a) (b)	Explain the meaning and significance of the "The Method of steepest Ascent" Explain how randomization and replica are useful in design of experiments. OR	07 07
Q.5	(a)	Distinguish between first order and second order models. When will you go for a central composite design?	07
	(b)	What is six sigma approach? Explain about six sigma project teams	07
