Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS / M.TECH (IEM) / SEM-2 / IEM-203 / 2011

2011

PRODUCT DESIGN AND DEVELOPMENT

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer any *five* of the following. 5 × 14 = 70

1. a) Explain the concept of 'Loss Function' as given by Taguchi. State the Quadratic Loss Function for 'Normal the Best'. 7

   b) In a metal rolling the thickness is important parameter and the nominal value is 6 ± 1 mm. The loss due to rejection is Rs. 30. The actual thickness in production was measured as 6·6 mm. Calculate the loss coefficient and the average loss. 7

2. a) What is Concurrent Engineering ? What are the objectives of Concurrent Engineering (CE) ? 6

   b) Distinguish between Traditional Engineering and Concurrent Engineering. 4

   c) "Concurrent Engineering is a multifunctional team approach." Explain this statement. 4

3. a) What are the strategic plans of Concurrent Engineering ? 7

   b) What are the factors related to the product as well as the company to be considered for implementation of Concurrent Engineering ? 7

4. a) Explain about the various classes of modes for product development. 10

   b) What do you understand by product formation ? 4

5. a) What is rapid prototyping ? Explain the advantages of rapid prototyping over conventional model making. Mention various types of rapid prototyping. 7

   b) Write short notes on 'Reverse Engineering'. 7

6. a) Explain about Signal to Noise ratio analysis for optimal parametric design. 7

   b) What is Robust Design ? Write down the steps of Taguchi methodology of Robust design. 7

7. Elucidate the product development process from 'Concept Development' to 'Production Ramp up' with details of each phase.

8. a) Through the various steps of DFM explain how it influences the product cost. 8

   b) Discuss the usefulness of 'Target Costing' approach in product development / manufacturing decisions. 6

9. Write short notes on any *two* of the following : 2 × 7

   a) Design for Assembly

   b) Design for X

   c) Parameter Design

   d) Process flow of Product Design and major control points.

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