(3 Hours) [Total Marks : 80]

Note : (1) Question number 1 is compulsory
(2) Attempt any three out of remaining five questions
(3) Assume suitable data if necessary
(4) Figures to right indicate full marks

1. Solve any four: 20
   (a) What is Taguchi's loss function? Explain its importance in product design.
   (b) Write a short note on Reverse Engineering
   (c) What is Industrial product design? Explain in brief.
   (d) How Design of Experiment (DOE) helps in Robust Design of new product or process development.
   (e) Explain modular architecture of product with its advantages.
   (f) What are intellectual property rights relevant to product design and development? Explain in brief.

2. (a) What is QFD? Explain the importance of quality house in Product Design with the help of Example. 10
   (b) What are the different factors and general rules considered for Design for Manufacturing (DFM) in case of welding? Explain. 10

3. (a) Explain Failure Mode Effect Analysis with suitable case study. 10
   (b) What are various physiological and psychological considerations in ergonomics? Explain. 10

4. (a) Define value of a product. Explain various steps involved in value analysis with an example of your choice. 10
   (b) Explain simple Man Machine Interaction in Ergonomics with help of Block Diagram. 10
   (c) Write a short note on anthropometry. 10

5. (a) Explain 7 phases of Morphology of design with an example. 10
   (b) Explain concurrent engineering approach for design and development of product. 10

6. (a) Explain the following: 20
   (i) Design for Environment.
   (ii) Rapid prototyping
   (iii) Product life cycle management
   (iv) Design for Assembly.

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