

- N.B.:** 1) Question **No.1** is compulsory.
2) Attempt **any three** questions out of remaining five questions.
3) Assume suitable data if necessary.
4) Figures to the right indicate full marks.

- Q.1 Explain the following (Any four)**
- i) Anthropometry (05)**
 - ii) Reverse Engineering (05)**
 - iii) Design for Environment (05)**
 - iv) Simultaneous Engineering Approach (05)**
 - v) Patents and IP acts (05)**
- Q.2 (a) Define value of a product. Explain various steps involved in value analysis with an example of your choice. (10)**
- (b) What are the different factors and general rules considered for Design for Manufacturing (DFM) in case of sheet metal process? Explain. (10)**
- Q.3 (a) Explain 7 phases of Morphology of design with an example. (10)**
- (b) How Design of Experiment (DOE) helps in Robust Design of new product or process development. (05)**
- (c) Describe different elements of product costing with example. (05)**
- Q.4 (a) Explain product FMEA with appropriate example. (10)**
- (b) Explain simple Man Machine Interaction in Ergonomics with help of Block Diagram. (05)**
- (c) What is Industrial product design? Explain in brief. (05)**
- Q.5 (a) What are various physiological and psychological considerations in ergonomics? Explain. (10)**
- (b) What is Taguchi's loss function? Explain its importance in product design. (05)**
- (c) Explain various stages of product life cycle management. (05)**
- Q.6 (a) What is QFD? Explain the importance of quality house in Product Design with the help of Example. (10)**
- (b) What is Product Architecture? Explain its types with their applicability. (10)**
