

Instructions:

1. Question Number 1 is Compulsory
2. Attempt ANY THREE Questions out of remaining FIVE
3. Use illustrative diagrams wherever required

Q1) Attempt any FOUR questions

- a) Define new product. What is the need for developing new products? 05
- b) What is product life cycle? Draw the four phases of product life cycle. 05
- c) Draw the flow chart of Concept Development Process in the product design. 05
- d) Why it is necessary to integrate the basic forms and elements of a product like balance, rhythm and proportion? 05
- e) What are the principles of Design for Manufacturing and Assembly (DFMA)? 05
- f) List ANY FIVE Prototyping techniques used in manufacturing a product. 05

Q2) a) Explain SIX steps/phases of the Generic product development process with flow chart. 10
b) Define market research. List and explain the methods of market research required in the product design and development. 10

Q3) a) What do you mean by concept selection? Explain concept screening and concept scoring methodology giving example. 10
b) What is Product Architecture? Explain the Steps in developing product architecture. 10

Q4) a) Explain the process of identifying customer needs in concept development process. 10
b) What is Quality Function Deployment (QFD)? Explain the phases of QFD. 10

Q5) a) Draw House of Quality (HoQ) and highlight the customer matrix part in (HoQ)? Explain Voice of the Customer as an input to QFD. 10
b) Define creative thinking. List any FIVE Creativity and problem-solving methods. Explain the Brainstorming Technique used in product development. 10

Q6) a) What is golden ratio of proportion? Explain any THREE applications of Golden Ratio? 10
b) Write short notes on Design for Environment and Design for Serviceability. 10