

3 Hours

Marks : 80

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. List various types of new products. **05**
- b) Draw figure showing the steps or phases of the product development process. **05**
- c) Define Quality Function Deployment (QFD). List the steps of QFD. **05**
- d) Differentiate between engineering design and industrial design. **05**
- e) What do you mean by golden ratio of proportion? Give examples of golden ratio uses in day-to-day life. **05**
- f) Explain the term Design for Environment. **05**

Q2) a) What is product life cycle? Explain the four phases of product life cycle with diagram. **10**
b) Define market research. Explain the methods of market research required in the product design and development. **10**

Q3) a) For redevelopment of a consumer product “college backpack”, prepare concept selection matrix. Generate the concept, screen the concept, score the concept and rank the concept. **10**
b) Explain in brief various concept generation and selection methods. **10**

Q4) a) What is House of Quality (HoQ)? Explain various components of HoQ. **10**
b) Draw House of Quality (HoQ) for a consumer product “college backpack”. **10**

Q5) a) Define creative thinking and creativity. List the Creativity and problem-solving methods. Explain any ONE method. **10**
b) What are the basic forms and elements of a product? Why it is necessary to integrate the basic forms and elements? Explain with examples. **10**

Q6) a) What is DFMA? Explain the steps used in DFMA giving examples. **10**
b) Write short notes on **05**
a) 3 D printing method
b) Role of computers in product design and manufacturing **05**