



B.E DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Sixth Semester

MECHANICAL ENGINEERING

U18MEE0024: Product Design and Development

COURSE OUTCOMES

- CO1:** Apply concepts of product development and outline product planning process.
- CO2:** Apply relative importance of customer needs in establishing product specifications.
- CO3:** Identify concept generation activities and summarize the methodology involved in concept selection and testing.
- CO4:** Outline supply chain considerations in product architecture and understand the industrial design process.
- CO5:** Apply design for manufacturing concepts in estimating manufacturing costs.
- CO6:** Apply principles of prototyping in product development economics and highlight importance of managing projects.

Time: Three Hours

Maximum Marks: 100

**Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)**

- | | | |
|---|-----|-------------------|
| 1. Define supply chain | CO1 | [K ₁] |
| 2. Recall Platform Products | CO1 | [K ₁] |
| 3. What are goals of identifying customer needs? | CO2 | [K ₁] |
| 4. List the five-step process for refining the specifications | CO2 | [K ₁] |
| 5. Find the use of concept scoring method | CO3 | [K ₁] |
| 6. Tell about top box score | CO3 | [K ₁] |
| 7. Name the types of Modularity | CO4 | [K ₁] |
| 8. Define product performance | CO5 | [K ₁] |
| 9. What are the uses for prototypes? | CO6 | [K ₁] |
| 10. Name the Elements of Economic Analysis | CO6 | [K ₁] |

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

| | | | | | |
|-----|----|---|---|-----|-------------------|
| 11. | a) | Classify the Characteristics of Successful Product Development | 8 | CO1 | [K ₂] |
| | b) | Identify the Challenges of Product Development | 8 | CO1 | [K ₃] |
| 12. | a) | Explain the process of identifying customer needs | 8 | CO2 | [K ₂] |
| | b) | Illustrate the process of establishing the target specifications | 8 | CO2 | [K ₂] |
| 13. | a) | Construct a five-step process of concept generation method | 8 | CO3 | [K ₃] |
| | b) | Explain the six step Concept screening process | 8 | CO3 | [K ₂] |
| 14. | a) | Construct a seven-step method for testing product concepts | 8 | CO3 | [K ₃] |
| | b) | Illustrate a four-step method for establishing the product architecture | 8 | CO4 | [K ₂] |
| 15. | a) | Outline Industrial Design Process | 8 | CO4 | [K ₂] |
| | b) | Illustrate the Design for manufacturing process | 8 | CO5 | [K ₂] |
| 16. | a) | Explain the four-step method for planning a prototype | 8 | CO6 | [K ₂] |
| | b) | Illustrate the Economic Analysis Process | 8 | CO6 | [K ₂] |

Please indicate knowledge level (K₁toK₆) and Course Outcome level (CO1 to CO5) against each question for each subdivision.