



B.E/B.TECH DEGREE EXAMINATIONS: APRIL /MAY 2024

(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)

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| 1. Discuss the challenges of product development. | CO1 [K ₁] |
| 2. Highlight the significance of concurrent engineering approach in controlling design cycle time. | CO1 [K ₁] |
| 3. What are the steps involved in establishing target specifications? | CO2 [K ₁] |
| 4. Mention any three types of customer need with an example | CO2 [K ₁] |
| 5. Brief the significance of Pugh concept screening. | CO3 [K ₂] |
| 6. Define concept scoring. | CO3 [K ₁] |
| 7. How important is industrial design to a product? | CO4 [K ₂] |
| 8. Define product architecture. | CO4 [K ₁] |
| 9. Specify any three different tools used for project planning. | CO5 [K ₂] |
| 10. List out the various uses of prototype. | CO6 [K ₁] |

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

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| 11. | a) | Explain in detail about six phases of generic product development process and their functions with case study example. | 8 | CO1 | [K ₂] |
| | b) | Discuss the various types of opportunities and explain the opportunity identification process in product development. | 8 | CO1 | [K ₃] |
| 12. | a) | Discuss about different types of customer needs with an example. | 8 | CO2 | [K ₃] |
| | b) | Describe the various sources for gathering customer need and their characteristics. | 8 | CO2 | [K ₃] |
| 13. | a) | Explain the concept generation process and elaborate on traditional brainstorming method. | 8 | CO3 | [K ₄] |
| | b) | Describe the steps involved in concept selection process with a product of your own example. | 8 | CO3 | [K ₄] |
| 14. | | Discuss the characteristics of industrial design and its phases and explain the guidelines to be followed in creating a user-friendly design with an example | 16 | CO4 | [K ₃] |
| 15. | | Write short notes on | | CO5 | [K ₂] |
| | | (i) Design for manufacturing for product development | 8 | | |
| | | (ii) Elements of the manufacturing cost of a product | 8 | | |
| 16. | | Enumerate the differences between the two kinds of reviews in project summary evaluation: the postmortem review and post-installation system review? Describe each of these reviews. | 16 | CO6 | [K ₃] |
