

**THE KAVERY ENGINEERING COLLEGE**  
(An Autonomous Institution)

M.E DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025

*First Semester*

*Product Design and Development*

PPDT2412 - Reverse Engineering

*Regulations - 2024*

*Duration : 3 Hrs*

*Maximum : 100 Marks*

**PART - A (ANSWER ALL QUESTIONS) (Marks 10\*2=20)**

| <i>Q.No</i> | <i>Questions</i>                                                                     | <i>BLT</i> | <i>CO</i> | <i>Marks</i> |
|-------------|--------------------------------------------------------------------------------------|------------|-----------|--------------|
| 1.          | Define reverse engineering and explain its primary purpose in product development.   | L1         | 1         | 2            |
| 2.          | State the significance of prototyping in the reverse engineering process.            | L2         | 1         | 2            |
| 3.          | How can phase formation in alloys be identified?                                     | L1         | 2         | 2            |
| 4.          | List any two factors that contribute to the mechanical strength of materials.        | L1         | 2         | 2            |
| 5.          | What techniques are commonly used for composition determination of materials?        | L1         | 3         | 2            |
| 6.          | Microstructure analysis is critical in evaluating material performance - Justify.    | L3         | 3         | 2            |
| 7.          | Define reliability in the context of data analysis.                                  | L1         | 4         | 2            |
| 8.          | What is data conformity, and why is it important in quality control?                 | L1         | 4         | 2            |
| 9.          | What is the role of patents in protecting innovations against reverse engineering?   | L1         | 5         | 2            |
| 10.         | Why trade secrets are significant in industries where reverse engineering is common? | L2         | 5         | 2            |

**PART - B (ANSWER ALL QUESTIONS) (Marks 5\*16 = 80)**

| <i>Q.No</i> | <i>Questions</i>                                                                                                                                                     | <i>BLT</i> | <i>CO</i> | <i>Marks</i> |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|--------------|
| 11.         | a Describe the importance of key phases of generic process in the overall workflow of reverse engineering.                                                           | L2         | 1         | 16           |
|             | Or                                                                                                                                                                   |            |           |              |
|             | b Explain the methodologies used in computer-aided reverse engineering for both surface model and solid model reconstruction.                                        | L2         | 1         | 16           |
| 12.         | a Discuss the mechanisms of fatigue failure in materials and the factors that influence it.                                                                          | L3         | 2         | 16           |
|             | Or                                                                                                                                                                   |            |           |              |
|             | b Discuss the relationship between creep behavior and stress rupture in materials at elevated temperatures, and how environmental factors can worsen these failures. | L3         | 2         | 16           |

|     |   |                                                                                                                                                                                                     |    |   |    |
|-----|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---|----|
| 13. | a | Evaluate the significance of manufacturing process verification and analyze how it impacts the consistency and quality of products in the manufacturing sector.                                     | L5 | 3 | 16 |
|     |   | Or                                                                                                                                                                                                  |    |   |    |
|     | b | Interpret the factors influencing the mechanical properties of materials and discuss the methods for analyzing microstructure in quality control.                                                   | L5 | 3 | 16 |
| 14. | a | Apply Weibull analysis to evaluate the reliability of a new product design using statistical techniques, and discuss how to interpret the results for design improvement decisions.                 | L3 | 4 | 16 |
|     |   | Or                                                                                                                                                                                                  |    |   |    |
|     | b | Enumerate the process of applying data conformity and acceptance criteria to ensure quality compliance in manufacturing, detailing the steps and their significance.                                | L3 | 4 | 16 |
| 15. | a | Interpret the key differences between patents, copyrights, and trade secrets in intellectual property law, and explain how each form of protection affects reverse engineering.                     | L2 | 5 | 16 |
|     |   | Or                                                                                                                                                                                                  |    |   |    |
|     | b | Explain the significance of reverse engineering in the automotive, aerospace, and medical device industries, focusing on how each sector benefits from innovation, safety, and design improvements. | L2 | 5 | 16 |