

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***UG/PG DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2026****Second Semester****Product Design and Development****PPDT2422 - DESIGNING WITH ADVANCED MATERIALS****Regulations - 2024****Duration: 3 Hrs.****Maximum: 100 Marks****PART – A(ANSWER ALL QUESTIONS) (Marks 10*2=20)**

Q.No	Questions	BLT	CO	Marks
1.	Classify the phases of Reverse Engineering.	L2	1	2
2.	List any two methods used for Dimensional Measurement.	L1	1	2
3.	Define Hardness in the context of material properties.	L1	2	2
4.	How does Fatigue contribute to the failure of machine components?	L2	2	2
5.	Differentiate between qualitative and quantitative composition determination.	L2	3	2
6.	Name two common techniques used for microstructure examination.	L1	3	2
7.	Define Weibull Analysis in reliability engineering.	L1	4	2
8.	How does System Compatibility impact impacts in software performance?	L2	4	2
9.	Differentiate between patent infringement and reverse engineering.	L2	5	2
10.	State key reason for using reverse engineering in the aerospace industry.	L1	5	2

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

Q.No	Questions	BLT	CO	Marks
11. a	Discuss the role of Computer-Aided Reverse Engineering (CARE) and its applications in modern industries.	L2	1	16
	Or			
b	Explain the process of Surface and Solid Model Reconstruction with suitable examples.	L2	1	16
12. a	Illustrate the concept of alloy structure equivalency and its significance in material selection.	L2	2	16
	Or			
b	Explain creep and stress rupture mechanisms in materials and discuss their impact on long-term component performance.	L2	2	16
13. a	Develop the steps to be followed in the process of spectroscopic analysis for determining the composition of an alloy of your choice.	L3	3	16

Or

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| b | Select a heat-treated steel component of your choice and describe the step-by-step procedure for conducting microstructure analysis to verify the component's quality, with neat sketches. | L3 | 3 | 16 |
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| 14. a | Critically analyze how the theory of interference impacts the reliability of engineering systems over time. Use statistical reasoning to compare systems with and without interference effects. | L4 | 4 | 16 |
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| Or | | | | |
| b | Analyze the relationship between system compatibility and the effectiveness of a chosen performance evaluation methodology. Evaluate how mismatched systems and tools can lead to flawed assessments. | L4 | 4 | 16 |
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| 15. a | Critically analyze the ethical and legal challenges involved when reverse engineering third-party materials that are protected under trade secrets. | L4 | 5 | 16 |
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| Or | | | | |
| b | Analyze the role of reverse engineering in the development of medical devices, particularly focusing on the ethical considerations, impact on innovation, and potential risks in terms of product reliability and patient safety. | L4 | 5 | 16 |
