

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***M.E DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025***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)**

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
1.	Define Reverse Engineering.	L1	1	2
2.	List any two-dimensional measuring techniques used to design product in reverse engineering.	L1	1	2
3.	Identify the need of alloy structure equivalency in materials engineering.	L3	2	2
4.	Illustrate any 2 real time engineering product examples experiencing environmentally induced failure.	L2	2	2
5.	What are the techniques used in materials engineering field to find the composition of advanced material?	L1	3	2
6.	Recall the steps involved in manufacturing process verification.	L1	3	2
7.	Illustrate the essential features to be represented in the data report for statistical Analysis.	L2	4	2
8.	Compare the concepts of system compatibility and system reliability.	L2	4	2
9.	Discover the importance of maintaining legality in reverse engineering.	L4	5	2
10.	Identify the role of CMM in reverse engineering.	L3	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 i Summarize different phases of reverse engineering and outline how it differs from conventional engineering process in product manufacturing.	L2	1	8
	ii Explain the role of computer aided reverse engineering in product design.	L2	1	8
	Or			
	b i Compare the features involved in the constructions of solid and surface modelling with suitable product examples.	L2	1	8
	ii Summarize the effects of eliminating the prototyping process stage in product design and manufacturing.	L2	1	8
12.	a i Analyze the significance and outcomes of alloy structure equivalency practice in the fields of materials engineering and manufacturing.	L4	2	8
	ii Examine the influence of hardness and toughness properties during design of products with sustainability.	L4	2	8

Or

	b i	Discover the effect of stress concentration factor on fatigue life of product under cyclic loading and analyze its related to the shape of the product.	L4	2	8
	ii	Compare the creep behavior of two different nature materials by interpreting their creep curves and relate its key parameters like steady-state creep rate and rupture time.	L4	2	8
13.	a	Identify the purpose and importance of material specifications for ensuring quality, safety, and performance in engineering applications and Illustrate the materials specifications examples and composition for any three engineering materials.	L3	3	16
		Or			
	b	Compare the techniques used to find the microstructure of materials in different scales and analyzing its characteristics during the design of products with advanced materials.	L3	3	16
14.	a i	Demonstrate the use of Weibull Statistical Analysis tool in reliability engineering with product example.	L2	4	8
	ii	Explain the step by step procedure involved in statistical data analysis in relation to design of products with advanced materials and design strategies.	L2	4	8
		Or			
	b i	Explain the importance of data conformity and acceptance in ensuring the reliability and accuracy of analytical outcomes in critical automotive manufacturing industries.	L2	4	8
	ii	Explain how the compatibility and performance evaluation of the product development system is ensured in a multi-platform environment.	L2	4	8
15.	a	Compare the features, benefits and limitations on acquiring Patent, Copy rights and trademarks with available product examples.	L2	5	16
		Or			
	b	Explain the role of reverse engineering with example in upgrading the design features of aerospace components by relating its importance in product replacement and optimization.	L2	5	16