Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

M.E. DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025

Second Semester

Product Design and Development

CD4151/PPDT2425 - Concepts of Engineering Design

Regulations – 2021/2024

Duration : 3 Hrs ***Maximum : 100 Marks***

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

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	Recall the importance of design in engineering.	L1	1	2
2.	Outline the concept of concurrent engineering with an example.	L2	1	2
3.	List out different ways of identifying customer needs.	L1	2	2
4.	Differentiate between ergonomics and aesthetics in product design.	L2	2	2
5.	What is TRIZ in design methodology?	L1	3	2
6.	Infer the role of mathematical modeling in product design.	L2	3	2
7.	Define the term ‘Weighted property index’.	L1	4	2
8.	Compare design for manufacture and design for assembly.	L2	4	2
9.	Recall the significance of binomial distribution.	L1	5	2
10.	List out the applications of reliability curve.	L2	5	2

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

Q.No		*Questions*	*BLT*	*CO*	*Marks*
11.	a	Illustrate different phases in morphology of design for developing a new eco-friendly sustainable engineering product.	L3	1	16
		Or			
	b	Apply the concept of technological forecasting and competition benchmarking for designing a modernized new e-vehicle.	L3	1	16
12.	a	Explain the steps in constructing “House of Quality” and its various components and arriving ranking according to QFD.	L2	2	16
		Or			
	b	Summarize about the influence of product liability and intellectual property rights in engineering design process.	L2	2	16

13.	a	i	Discuss various creativity and problem solving methods used for solving problems in modern industry 4.0 environments.	L2	3	10
		i i	Write the significance of parametric design in engineering product development.	L2	3	06
			Or			
	b	i	Elaborate the application of finite element analysis in developing design concepts for engineering products.	L2	3	10
		i i	Outline the role of optimization methods in product design with suitable examples.	L2	3	06
14.	a		Explain the steps and procedures in conducting 'Value Analysis' for any basic engineering product of your choice.	L3	4	16
			Or			
	b		Develop the design factors to be considered for redesign of casting based on parting line consideration with suitable sketch.	L3	4	16
15.	a		Analyze the steps involved in hypothesis testing and interpret the results to compare the failure rates of two advanced manufacturing processes used in aircraft component production.	L4	5	16
			Or			
	b		Develop the format of an FMEA table for failures in any automotive component and calculate the Risk Priority Number (RPN) for the same.	L4	5	16