

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

M.E DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Second Semester

Product Design and Development

CD4151 -Concepts of Engineering Design

Regulations - 2021

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.	List down the four C's of design.	RE	1	2
2.	Discuss the term codes and standards.	UN	1	2
3.	Differentiate vertical thinking and lateral thinking.	UN	2	2
4.	State the principle of prototyping.	RE	2	2
5.	Discuss the term detail design.	UN	3	2
6.	List down the importance of mathematical modeling.	RE	3	2
7.	Define the term weighted property Index.	UN	4	2
8.	List the different types of residual Stresses.	RE	4	2
9.	Define the term mean time to failure.	UN	5	2
10.	List the primary goal of FMEA.	RE	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a Explain how technological forecasting influences design decisions. Provide examples of how it can guide long-term product development.	UN	1	13
	Or			
	b Describe the term morphology of design and enumerate the steps in the process of designing a product.	UN	1	13
12.	a Discover the impact of human factors, ergonomics, and aesthetics on the design process.	AN	2	13
	Or			
	b Analyze the importance of contracts, product liability, intellectual property protection, and codes of ethics in engineering design.	AN	2	13
13.	a i Explain the positive steps that you can take to enhance your creative thinking.	UN	3	6
	ii Explain the different types of mental blocks.	UN	3	10
	Or			
	b Write short notes on (i) Inventive problem solving (TRIZ). (ii) Brainstorming. (iii) Force fitting methods.	UN	3	13

14.	a	Compare and contrast DFM and DFA principles. How do these approaches improve product manufacturability and reduce production costs?	UN	4	13
		Or			
	b	Describe the role of value analysis in optimizing material choices and design features. How does this process contribute to achieving cost-effective designs without compromising quality?	RE	4	13
15.	a	Define reliability theory and describe how it is applied in engineering design. What strategies do engineers use to design for reliability, and how does this impact product life cycle?	RE	5	13
		Or			
	b	Find the concept of reliability-centered maintenance. How does RCM ensure that maintenance activities are aligned with reliability goals and system performance?	RE	5	13

*PART – C (Marks 1*15 = 15)*

<i>Q.No</i>		<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
16.	a	With growing environmental concerns, how can engineers integrate sustainability into product design? Discuss the implications of environmentally responsible design on the lifecycle of products.	EV	1	15
		Or			
	b	Discuss the purpose of FMEA in identifying potential failure modes in a design. How does it help engineers prioritize risks and improve system reliability?	EV	5	15