

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***M.E DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025***Second Semester**Product Design and Development***PPDT2425 - Concepts of Engineering Design***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.	Recall the importance of design in engineering.	L1	1	2
2.	What do you understand by concurrent engineering?	L2	1	2
3.	Why does QFD refer as "voice of customer"?	L2	2	2
4.	What are the codes of ethics?	L1	2	2
5.	Interpret the concept of TRIZ.	L2	3	2
6.	Write about rapid prototyping.	L1	3	2
7.	Infer the main idea of cost Vs performance.	L2	4	2
8.	Contrast fatigue, fracture and failure.	L2	4	2
9.	How do you use hypothesis testing to draw conclusion about a population?	L2	5	2
10.	What are the five basic steps of FMEA?	L1	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 Outline the stages of design process to develop a simple consumer product. Discuss the considerations for good design at each stage. Or	L2	1	16
	b Describe the importance of codes and standards in product design. How do they influence the overall design process?	L2	1	16
12.	a Construct a Quality Function Deployment (QFD) matrix for designing a kitchen appliance. Explain in detail how customer needs are converted into design requirements. Or	L3	2	16
	b Identify the role of human factors, ergonomics, and societal considerations in product design. Why are they important?	L3	2	16
13.	a Make use of the Theory of Inventive Problem Solving (TRIZ) methodology to solve a design conflict in a smartphone, such as balancing slimness and battery life. Or	L3	3	16
	b Select a mechanical wrench with complex geometry, explain how you would use mathematical modeling, and finite element analysis (FEA) to optimize the design for strength and weight reduction. Provide a step-by-step approach.	L3	3	16

14.	a	Examine the role of value analysis in optimizing product design. How does it help in balancing functionality, cost, and manufacturing ease for a product of your choice?	L4	4	16
	Or				
	b	Simplify the importance of design for manufacturing and assembly (DFMA). How would poor DFMA practices affect the failure and fracture behavior of products under service conditions?	L4	4	16
15.	a	Analyze the use of reliability theory and probability distributions in designing a maintenance plan for a wind turbine. Summarize how these tools help in maximizing operational efficiency and reliability.	L4	5	16
	Or				
	b	Inspect the application of Failure Mode Effect Analysis (FMEA) in a washing machine design. Discuss how analyzing potential failure modes can lead to design improvements.	L4	5	16