Name: **Enrolment No:**	

UPES

End Semester Examination, May 2024

Course : B Tech. ADE **Semester: VII**

Program : Product Design and Development **Time : 03 hrs.**

Course Code: MEPD 4020P **Max. Marks: 100**

Instructions: Draw figures and diagrams, wherever required.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Differentiate between Value Engineering (VE) and Value Analysis (VA) used in engineering design.	**4**	**CO1**
Q2	Describe anatomy of function with suitable example.	**4**	**CO2**
Q3	Classify industrial products with suitable example.	**4**	**CO1**
Q4	Enumerate common development methods used for manufacturing goods.	**4**	**CO2**
Q5	Explain the relevance of market research in the product development process.	**4**	**CO4**
	SECTION B **(4Qx10M= 40 Marks)**		
Q 6	Describe key principles and strategies involved in implementing Design for Assembly (DFA) within the context of product development for enhancing assembly efficiency, reducing manufacturing costs, and improving overall product quality.	**10**	**CO1**
Q 7	Explain the integration of ergonomics into product design contribute to user satisfaction and overall product success. Also, illustrate with examples the influence of ergonomic on design choices.	**10**	**CO2**
Q 8	Discuss the design considerations for metallic and non-metallic products manufactured through various processes such as casting, machining, and injection molding.	**10**	**CO3**
Q 9	Compare and contrast different rapid prototyping techniques such as Stereolithography (SLA), Laminated Object Manufacturing (LOM), and Selective Laser Sintering (SLS), highlighting their applications and limitations. **OR**	**10**	**CO4**

	Discuss the role of rapid prototyping in accelerating the product development cycle. Also, explain the importance of rapid prototyping techniques in validating the concepts and iterate designs quickly.		
SECTION-C (2Qx20M=40 Marks)			
Q 10	Value engineering is often hailed as a key approach in product design. Explain the concept of value engineering and its role in enhancing product development. Provide a detailed comparison between traditional cost-cutting measures and value engineering, highlighting the benefits and limitations of each approach.	**20**	**CO3**
Q 11	Examine the significance of encompassing the entire product life cycle in product design and development. Additionally, elucidate how a comprehensive understanding of the product life cycle influences decision-making processes within an organization's product policy. Support your explanation with relevant examples. **OR** Describe the steps involved in conducting a Functional Analysis System Technique (FAST) analysis during product development. Explain the application of FAST to identifying primary, secondary, and tertiary functions within a product? Provide a real-world example illustrating the application of FAST in product design.	**20**	**CO4**