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ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, APR / MAY 2024

Mechanical Engineering
 Semester II
ME3251 & Design Thinking
 (Regulation-2023)

Time:3hrs

Max.Marks: 100

CO1	Apply design Concepts for manufacturing, Assembly and Environment.
CO2	Make Economically sound decisions.
CO3	Design methodologies on industrial ecology.
CO4	Analyse the design for its manufacturability using modern quality control concepts & approaches.
CO5	Learn the values of design & how it impacts society, industry and the environment.

BL – Bloom's Taxonomy Levels

(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

PART- A(10x2=20Marks)
 (Answer all Questions)

Q.No.	Questions	Marks	CO	BL
1	When will we initiate the design thinking process?	2	1	L2
2	What are the corporate forces that will undermine the design thinking process?	2	1	L2
3	Name any two examples of Platform product and High-Risk product.	2	2	L2
4	What are the six steps involved in the opportunity identification process?	2	2	L2
5	What are the four types of product development projects?	2	2	L2
6	What is DFE?	2	3	L2
7	Write a short note on integrated architecture with an example.	2	3	L2
8	What is RPN in FMEA?	2	4	L2
9	What is Target costing?	2	5	L2
10	What are the advantages of <i>Intellectual Property Rights</i> ?	2	5	L2

PART- B(5x 13=65Marks)

Q.No.	Questions	Marks	CO	BL
11 (a)	Explain the nine criteria of an inspirational design? OR	13	1	L3
11 (b)	How would you integrate the design into the Fuzzy Front End? Illustrate the same.	13	1	L3
12 (a)	Construct a House of quality for a footbridge/ overpass bridge in front of your University. Assume the customer requirements and the engineering characteristics of your own. OR	13	2	L4
12 (b)	Explain the six phases of generic development process with an example.	13	2	L4

13 (a)	What is Delayed Differentiation? Explain its role in the cost reduction of operating the supply chain and the two design principles for postponement? OR	13	3	<u>L4</u>
13 (b)	What is DFM? Explain the steps involved in the estimation of manufacturing cost with a flow chart.	13	3	<u>L4</u>
14 (a)	Explain the seven step process to develop a robust product through DOE? OR	13	4	<u>L4</u>
14 (b)	What is FMEA and explain how to perform FMEA with an example? What are the benefits of FMEA?	13	4	<u>L4</u>
15 (a)	In the context of Life Cycle costs, illustrate the following: i) Operating Cost (6) ii) Maintenance cost (7) OR	13	5	<u>L4</u>
15 (b)	Explain the various types of Intellectual property and write the steps involved for obtaining a patent?	13	5	<u>L4</u>

PART- C(1x 15=15Marks)
(Q.No.16 is compulsory)

Q.No.	Questions	Marks	CO	BL
16.	Create a case study for any New Product Development illustrate the following: i) Need Identification ii) Concept generation (Conceptual Design)	7 8	1	<u>L6</u>

