ADDITIONAL CONTROLLER OF EXAMINATIONS AU CHENNAI 600 025

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Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

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

B.E MECHANICAL ENGINEERING
Semester 04
ME23404 PRODUCT DESIGN AND DEVELOPMENT
(Regulation2023)

Time:3hrs Max.Marks: 100

CO1 Apply the principles of generic development process; and understanding the organization structure for new product development.
CO2 Conduct customer need analysis; and to design and set product specification for new product development.
CO3 Generate, select, and test the concepts for new product development
CO4 Apply principles of product architecture and industrial design for new product development.
CO5 Apply the principles in design for manufacturing and prototyping for new product development.

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	How does the product quality affects the product development?	2	1	L2
2	What role do experts from different functional areas play in the development process?	2	1	L2
3	Define the term latent need.	2	2	L1
4	State the use of technical model of the product.	2	2	L2
5	What are the prospects for computer support for concept generation activities?	2	3	L2
6	Differentiate between concept scoring and concept screening method.	2	3	L1
7	What do you understand by the term delayed differentiation?	2	4	L1
8	Give the importance of emotional appeal in assessing the industrial design.	2	4	L2
9	Write the impact of Design for manufacturing on product quality.	2	5	L2
10	Name any four benefits of implementing prototype in the product design and development process.	2	5	L1

PART- B(5x 13=65Marks)
(Restrict to a maximum of 2 subdivisions)

Q.No.	Questions	Marks	CO	BL
11 (a)	Suggest and explain the suitable composition of a product development team for an electromechanical product of modest complexity.	13	1	L3
	OR			
11 (b)	How would you adapt the generic product development Process for any customized product? Explain in detail.	13	1	L3

12 (a)	i. Illustrate the ways to organize the primary and secondary customer needs into hierarchical list considering the case study of a smart phone. ii. Analyze the relative importance of the needs for the above mentioned case study.	7 6	2	L4 L4
	OR			
12 (b)	i. In the scenario of product specifications how does the Quality functional development can be deployed for arriving them? ii. Suggest and analyze the specifications of any portable electronic device.	7 6	2	L4 L4
13 (a)	Consider a case study of a vegetable peeler and illustrate the steps of implementing the concept generation process for the same.	13	3	L3
	OR			
13 (b)	Consider a case study of a portable CD Case and illustrate the concept screening process for the same.	13	3	L3
14 (a)	i. Compare and contrast the modular and integrated product architecture. ii. With your example, how does a product can undergo necessary modification to become either a modular or an integrated architecture?	6 7	4	L4 L4
	OR			
14 (b)	i. Comprehend the impact of Computer-Based Tools on the Industrial design process. ii. Assess the role of industrial design for any product type in terms of product development activity.	6 7	4	L4 L4
15 (a)	In the context of design for manufacturing, how does the following factors affects it: i. estimation of the cost of assembly ii. estimation of overhead costs	 6 7	 5	 L3 L3
	OR			
15 (b)	Justify the following statements with the suitable examples i. A prototype may reduce the risk of costly Iterations. ii. Analytical prototypes are generally more flexible than physical prototypes	 6 7	 5	 L3 L3

PART- C(1x 15=15Marks)

(Q.No.16 is compulsory)

Q.No.	Questions	Marks	CO	BL
16.	i. Consider a case study of any two wheeler of your choice. Draw a schematic including the essential functional elements. Identify two or three possible clusterings of these elements into chunks. ii. Evaluate a case study to justify the need of analyzing ergonomics needs in the industrial design process .	8 7	3 4	L6 L5

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