KUMARAGURU
college of technology
character is life

Register Number:……

M.E/M.TECH DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

First Semester

MASTERS OF TECHNOLOGY MANAGEMENT

P18TME0035: Industrial Design and Development

COURSE OUTCOMES

CO1: Understand the product life cycle and management.

CO2: Sketch UI and UX for the product / prototypes

CO3: Build rapid prototypes using digital fabrication techniques.

CO4: Use hand and power tools for building mechanical design for prototypes

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions: -

PART A (10 x 1 = 10 Marks)

1. What is the significance of color theory in UI design? CO2 [K_2]

   a) It has no impact on user perception
   b) It influences user emotions and perception
   c) It only affects the aesthetic appeal
   d) It is irrelevant in digital interfaces

2. Which is not a phase of Product design CO1 [K_2]

   a) Market analysis
   b) Detailed design
   c) Feasibility
   d) Preliminary design

3. Designing an initial marketing strategy for a new product based on the _____ is called Marketing strategy/development CO1 [K_2]

   a) New product idea
   b) Product concept
   c) Test market results
   d) Product prototype

4. The expected qualities of a product are CO1 [K_2]

   a) it satisfies the needs of the customer and offers Unique Value Proposition
   b) Real Market Needs
   c) Potential for scalability and profitability
   d) all of the mentioned

5. The Ultimate objective of the Product CO3 [K_2]

   a) To provide a a new look
   b) To Monopolize the market

c) Utilizing existing manpower d) all of the mentioned

6. Which is not a phase of Product design CO1 [K_2]

a) Market analysis b) Detailed design

c) Feasibility d) Preliminary design

7. How does optimizing the Bill of Materials (BoM) contribute to product development efficiency? CO3 [K_2]

a) By increasing manufacturing complexity b) By reducing costs and streamlining production

c) By eliminating the need for testing d) By prioritizing aesthetics over functionality

8. Is support material needed in the SLS technique of 3D printing? Justify. CO2 [K_2]

a) Yes, to increase costs b) No, it doesn't affect the printing process

c) Yes, to prevent structural collapse during printing d) No, it's an unnecessary step

9. How does Rapid Prototyping contribute to product development CO4 [K_2]

a) Slowing down design iteration b) Increasing manufacturing costs

c) Accelerating design iteration d) Reducing product flexibility

10. What is the purpose of an Alternate Vendor List in product development? CO4 [K_2]

a) Creating competition among vendor b) Streamlining the supply chain

c) Eliminating all vendors except one d) Reducing the need for suppliers

PART B (10 x 2 = 20 Marks)

11. Explain the importance of BOM Optimization CO3 [K_2]
12. Mention the stages of product development cycle? CO1 [K_2]
13. What are the fundamental components of Industrial Design CO1 [K_2]
14. What are the advantages of SWOT Analysis CO1 [K_2]
15. Define the foundational principles of Industrial Product Design CO1 [K_1]
16. What is the purpose of pretotyping in Prototyping stages. CO3 [K_2]
17. State contrasting aspects between Industrial and Product design CO3 [K_1]
18. What are the needs for creating new product designs within industries. CO1 [K_2]
19. Mention various criteria used to evaluate the feasibility of an idea in product design. CO1 [K_1]
20. Define the foundational principles of Industrial Product Design CO3 [K_1]

PART C (10 x 5 = 50 Marks)

21. Case study “Gearbox Casing”- Consider the production of gearbox casing from CO1 [K_2]

conceptualization to Customer end product. Each stage in the design process should be described, together with the DFM and DFT.

22.	What is a Product Test Plan, and why is it crucial for ensuring a product's validation and qualification?	CO3	[K_2]
23.	How does Rapid Prototyping speed up the product development process, and what are some digital fabrication techniques used?	CO3	[K_2]
24.	Why is optimizing product parameters essential for achieving better product performance? Can you give examples?	CO1	[K_2]
25.	Explain the basics of design principles in UX/UX and how they make digital interfaces user-friendly.	CO2	[K_2]
26.	Elucidate the key principles integral to successful Industrial Design, providing practical use cases that illustrate their application in the design process.	CO1	[K_2]
27.	List and discuss common mistakes to avoid when designing a new product. Provide examples to illustrate these mistakes in product design.	CO1	[K_2]
28.	Outline the distinct phases involved in prototyping, illustrating each stage with reference to Meta's smart glasses.	CO2	[K_2]
29.	Explain the methodologies employed in Program and Risk Analysis within the Product Development Cycle.	CO3	[K_2]
30.	Evaluate the role of Industrial Design Innovations in augmenting user experience within products.	CO2	[K_2]

Answer any TWO Questions

PART D (2 x 10 = 20 Marks)

31.	Discuss the process of idea screening and selection in product development. Explain three criteria used to evaluate and prioritize ideas for further development, providing examples	CO1	[K_5]
32.	Consider you are working in a company that manufactures LCV (Light commercial vehicle). Create a QFD for the product development process, Consider at least two competitors and three requirements. 7 mark What ethical considerations are relevant to user engagement in UI/UX design? 3 mark	CO1	[K_3]
33.	Detail the sequential stages constituting the Product Development Cycle and illustrate each stage using the development of the PlayStation as a prominent case study, highlighting the implementation and significance of these stages within the gaming console's creation.	CO3	[K_6]

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