Reg. No. ☐☐☐☐☐☐☐☐☐☐☐☐

| Question Paper Code | 12576 |

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Eighth Semester

Mechanical Engineering

(Common to Electronics and Communication Engineering)

20MEEL901 - INDUSTRIAL DESIGN AND RAPID PROTOTYPING TECHNIQUES

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)
Answer ALL Questions

		Marks	K-Level	CO
1.	Distinguish between UI & UX design.	2	K2	CO1
2.	How does psychology influence UI & UX design?	2	K2	CO1
3.	Distinguish between native and hybrid apps.	2	K2	CO2
4.	Illustrate the primary function of a database in an application.	2	K2	CO2
5.	What does "degrees of freedom" mean for an object floating in space?	2	K1	CO3
6.	Define a mechanical joint and provide an example.	2	K1	CO3
7.	List two domains where prototyping is commonly used.	2	K1	CO4
8.	Briefly describe two different categories of rapid prototyping techniques.	2	K2	CO4
9.	Define the term "trace" in PCB design.	2	K1	CO5
10.	What is the significance of a ground plane in PCB design?	2	K1	CO5

PART - B (5 × 13 = 65 Marks)
Answer ALL Questions

| 11. a) | Design a wireframe for the homepage of a travel booking website, ensuring clear navigation and highlighting key features such as search functionality and deals section. Justify your layout choices in terms of user experience principles. | 13 | K2 | CO1 |

OR

| b) | Explain the significance of UI elements like buttons, forms, and menus in enhancing user interaction and navigation on a mobile app interface. Provide examples of how these elements can be optimized for touch-screen usability and accessibility. | 13 | K2 | CO1 |

| 12. a) | Compare and contrast the development processes for native mobile applications and web applications. Discuss the advantages and disadvantages of each approach. | 13 | K2 | CO2 |

OR

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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b) Explain the concept of a database schema and its importance in designing efficient and scalable databases for app development. Provide an example of a schema design for a specific type of application (e.g., e-commerce platform, social media app). *13 K2 CO2*

13. a) How do you ensure that a sketch in CAD software is fully constrained? Explain why constraints are important for maintaining the stability and flexibility of a design. Give examples of common constraints used in industrial design sketches. *13 K2 CO3*

OR

b) Explain the process of creating a parametric 3D model in Fusion 360. Discuss the significance of parametric modeling and how it allows for easy modification and iteration of designs. *13 K2 CO3*

14. a) Explain the product development process and importance of prototyping. *13 K2 CO4*

OR

b) Explain function Fused Deposition Method 3d printer and its parts. *13 K2 CO4*

15. a) Discuss the key factors to consider when selecting a PCB material for a specific application. *13 K2 CO5*

OR

b) Discuss the advantages and disadvantages of using surface mount technology (SMT) versus through-hole technology in PCB assembly. *13 K2 CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Create a user flow diagram for an e-commerce checkout process, considering various user pathways such as guest checkout, account creation, and payment options. How does your user flow prioritize simplicity and minimize friction points? *15 K3 CO1*

OR

b) Apply colour theory and psychology principles to redesign the colour scheme of a Digital Entertainment app. Explain how your chosen colours enhance usability, evoke desired emotions/actions, and maintain consistency across different UI elements. *15 K3 CO1*