

Enrollment No.....



Faculty of Engineering  
End Sem Examination May-2024  
ME3EL10 Product Design & Development

Programme: B.Tech.

Branch/Specialisation: ME

**Duration: 3 Hrs.****Maximum Marks: 60**

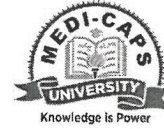
Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

- Q.1 i. The life cycle of a product includes- **1**  
 (a) Extraction of natural resources  
 (b) Processing of raw materials  
 (c) Manufacturing of products  
 (d) All of these
- ii. The first phase of morphology of design is- **1**  
 (a) Feasibility analysis (b) Prototyping  
 (c) Preliminary design (d) Detailed design
- iii. QFD stands for- **1**  
 (a) Quality Function Development  
 (b) Quality Function Deployment  
 (c) Quality Failure Development  
 (d) Quality Failure Deployment
- iv. 'Ergonomics' is related to human- **1**  
 (a) Comfort (b) Safety  
 (c) Both (a) and (b) (d) None of these
- v. "Problem Solving" and "Creative Thinking" are two main forms of- **1**  
 (a) Realistic thinking (b) Directed thinking  
 (c) Autistic thinking (d) Image
- vi. A product built to test ideas and changes until it resembles the final product is called: **1**  
 (a) Prototype (b) Scaled product  
 (c) Image (d) Pattern
- vii. A grouping of material properties which, maximizes some aspect of the performance of an engineering component is called: **1**  
 (a) Material class (b) Material index  
 (c) Group technology (d) Material factor

- [2]
- viii. The ultimate objective of the product is- **1**  
 (a) To provide a new look  
 (b) Utilizing existing manpower  
 (c) To monopolize the market  
 (d) All of these
- ix. Product is the ultimate objective of variety reduction- **1**  
 (a) Simplification (b) Standardization  
 (c) Specialization (d) All of these
- x. DFA stands for- **1**  
 (a) Design for Agriculture (b) Design for Area  
 (c) Design for Assembly (d) Design for Animation
- Q.2 i. Give importance of engineering design. **2**  
 ii. Explain different types of product design. **3**  
 iii. Explain steps involved in product design. **5**
- OR iv. Illustrate various essential factors to be considered in product design. **5**
- Q.3 i. What do you mean by voice of customer? Explain it by example. **3**  
 ii. Explain phases of QFD in product development process. **7**
- OR iii. Describe the ways of involving customers in development of a new product. **7**
- Q.4 i. Explain brainstorming. **3**  
 ii. Define ergonomics. Explain various human factors in design. **7**
- OR iii. Explain various types of Intellectual Property. Give importance of IPR. **7**
- Q.5 i. Explain steps involved in problem solving in design. **4**  
 ii. Explain various creative methods for designing in detail. **6**
- OR iii. Describe utility theory for decision making. **6**
- Q.6 Attempt any two:  
 i. Explain the significance of assessing quality in industrial design. **5**  
 ii. Describe design considerations for fatigue. **5**  
 iii. Explain with example to design for manufacturing (DFM). **5**

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**ANSWER KEY****Q.1 MCQ**

QUES.	ANS	QUES.	ANS
i	d	vi	a
ii	a	vii	b
iii	b	viii	c
iv	d	ix	c
v	a	x	c

Q.2 i) Importance of Ergo Design. 2 Marks

ii) Five types 3 Marks

iii) Five steps atleast 5 Marks

OR iv) Essential factors - 5 factors 5 Marks

Q.3 i) Voice of Customer + One example (2+1) Marks

ii) Phases of QFD in Product development (7 Marks)

OR iii) Ways of involving customers (7 Marks)

Q.4 i) Brainstorming (3 Marks)

ii) Ergonomics + Human Factors in Design (2+5 Marks)

OR iii) Four types of IPR + Importance of each (4+3 Marks)

Q.5 i) Four steps in problem solving (4 Marks)

ii) At least three/two Creative Methods (6 Marks)

OR iii) Utility Method for Decision Making (6 Marks)

Q.6 Attempt any two :

i) Significance of assessing Quality (5 Marks)

ii) Design considerations for Fatigue (5 Marks)

iii) Design for Manufacturing (DFM) (5 Marks)