



RollNo.

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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

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|-----|--|
| 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? | 13 | 1 | L3 |
| OR | | | | |
| 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. | 13 | 2 | L4 |
| OR | | | | |
| 12 (b) | Explain the six phases of generic development process with an example. | 13 | 2 | L4 |

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|--------|--|----|----------|-----------|
| 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?. | 13 | <u>3</u> | <u>L4</u> |
| OR | | | | |
| 13 (b) | What is DFM? Explain the steps involved in the estimation of manufacturing cost with a flow chart. | 13 | <u>3</u> | <u>L4</u> |
| 14 (a) | Explain the seven step process to develop a robust product through DOE? | 13 | <u>4</u> | <u>L4</u> |
| OR | | | | |
| 14 (b) | What is FMEA and explain how to perform FMEA with an example? What are the benefits of FMEA? | 13 | <u>4</u> | <u>L4</u> |
| 15 (a) | In the context of Life Cycle costs, illustrate the following: i) Operating Cost (6) ii) Maintenance cost (7) | 13 | <u>5</u> | <u>L4</u> |
| OR | | | | |
| 15 (b) | Explain the various types of Intellectual property and write the steps involved for obtaining a patent? | 13 | <u>5</u> | <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 | <u>1</u> | <u>L6</u> |

