



## Scheme of Valuation/Answer Key

*Scheme of evaluation (marks in brackets) and answers of problems/key*

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

B.Tech Degree S3 (R,S)/S3 (WP) (R,S)/S3 (PT)(S,FE)/S1 (PT)(S,FE) Examination November 2024  
(2019 Scheme)

**Course Code: EST200**

**Course Name: DESIGN AND ENGINEERING**

Max. Marks: 100

Duration: 3 Hours

### PART A

*Answer all questions. Each question carries 3 marks*

	Marks
1 Any three objectives and three constraints	(3)
2 Identify and abstract the statement of need. Identify data sources for search, Further clarify the statement of need, Identify Standard Industrial Classification, codes for the industry, Find what is available in the market that may lead to produce a better product, Conduct market surveys and market analysis for product development	(3)
3 Design thinking stages in a converging diverging model ( <i>Explanation or in a sketch</i> )	(3)
4 Differentiation of high fidelity and low fidelity prototyping with at least one example for each	(3)
5 Characteristics (1), objectives (2) of technical communication	(3)
6 Any three difference of Layout drawings and detailed drawings	(3)
7 Any three limitations of modular design with an example	(3)
8 Life cycle design approach details	(3)
9 Any three outcomes for design for manufacturing	(3)
10 Any three significance time value of money in design with an example	(3)

### PART B

*Answer any one full question from each module. Each question carries 14 marks*

#### Module 1

11 Stages of design process (4)	(14)
Explanation of the item for each stage (6)	
Sketches (4)	
12 Three design alternatives with sketches and explanations/specifications (9)	(14)



Explanation for selection of optimum design (2)

Functional structure (3)

### **Module 2**

- 13 Description for Five stages of design thinking process for the item (10) (14)  
 Sketches (4)
- 14 Empathising the problem (4), stages of design thinking process for the item (5), (14)  
 Sketches for the item and selection of optimum one (5)

### **Module 3**

- 15 Detailed sketch for the item (6) with approximate specifications (2) and (14)  
 dimensions (2), any improvement (2), Material selection with explanation (2),
- 16 Technical report showing introduction (2), Specifications (2), dimensions (2), (14)  
 detailed sketches (5), maintenance details (2), Conclusions (1)

### **Module 4**

- 17 Sketches (8) showing ergonomic aspects of the design, aesthetic aspects (4), (14)  
 explanation (2)
- 18 Kettle- natural inspiration-identification (like a beak of a bird or any other (14)  
 similar item) (4), Sketches for the comparison (10),

### **Module 5**

- 19 Changes in design for production with sketches (8), sustainability detailing (6) (14)
- 20 Changes in design for production with sketches of toys (8), cost detailing (6) (14)