

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
Fourth Semester B.Tech Degree Examination July 2021 (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  | Outline the significance of understanding customer requirements in design process | (3) |
| 2  | Describe any three constraints that can occur in design process of a lunch box    | (3) |
| 3  | Explain convergent questioning in design thinking                                 | (3) |
| 4  | Explain how conflict in team environment helps in better design of products       | (3) |
| 5  | Describe how prototyping helps in design process                                  | (3) |
| 6  | Explain any three advantages of communicating designs in writing.                 | (3) |
| 7  | Illustrate advantages of reverse engineering in design                            | (3) |
| 8  | Explain bio mimicry in design with an example                                     | (3) |
| 9  | Describe ethics to be followed in engineering design                              | (3) |
| 10 | Explain the significance of sustainability in engineering design                  | (3) |

**PART B**

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

**Module 1**

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|----|---|------|
| 11 | Explain the design process through designing a handbag for women of age group of 15 to 25 years. Use hand sketches to support your idea | (14) |
| 12 | Describe the concept of generating design alternatives and choosing a design through designing a coffee mug with the help of sketches   | (14) |

**Module 2**

- |    |   |      |
|----|---|------|
| 13 | Illustrate the design thinking process through designing a walking stick for elderly people.  | (14) |
| 14 | Design a parachute mechanism for safe landing an egg which is dropped from a height of 3 meters using iterative design thinking process with the help of sketches | (14) |

**Module 3**

- 15 Design an office chair and communicate your design using sketches with design detailing, material selection, scale drawings and dimensions (14)
- 16 Describe the role of mathematical modelling in design engineering citing an example (14)

**Module 4**

- 17 Illustrate modular design approach for designing of desktop computers (14)
- 18 Demonstrate the concept of ergonomics through design of a table lamp (14)

**Module 5**

- 19 Illustrate the changes in design of disposable tea cup in terms of production, use and sustainability (14)
- 20 Describe the how to estimate the cost of a table in design stage? Show how economics will influence the engineering designs. (14)

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