

APJ Abdul Kalam Technological University

Fourth Semester B.Tech Degree Examination paper July 2021 (2019 Scheme) EST200: Design and Engineering

Part A

Answer all questions. Each question carries 3 marks. (p. 1)

- 1. Outline the significance of understanding customer requirements in the design process.**
 - 2. Describe any three constraints that can occur in the design process of a lunch box.**
 - 3. Explain convergent questioning in design thinking.**
 - 4. Explain how conflict in a team environment helps in the better design of products.**
 - 5. Describe how prototyping helps in the design process.**
 - 6. Explain any three advantages of communicating designs in writing.**
 - 7. Illustrate the advantages of reverse engineering in design.**
 - 8. Explain biomimicry in design with an example.**
 - 9. Describe ethics to be followed in engineering design.**
 - 10. Explain the significance of sustainability in engineering design.**
-

Part B

Answer any one full question from each module. Each question carries 14 marks. (p. 1)

Module 1

- 1. Explain the design process through designing a handbag for women of the age group of 15 to 25 years. Use hand sketches to support your idea. (p. 1)**

- 2. Describe the concept of generating design alternatives and choosing a design through designing a coffee mug with the help of sketches. (p. 1)**

Module 2

- 1. Illustrate the design thinking process through designing a walking stick for elderly people. (p. 1)**
- 2. Design a parachute mechanism for safe landing an egg which is dropped from a height of 3 meters using an iterative design thinking process with the help of sketches. (p. 1)**

Module 3

- 1. Design an office chair and communicate your design using sketches with design detailing, material selection, scale drawings and dimensions. (p. 2)**
- 2. Describe the role of mathematical modelling in design engineering citing an example. (p. 2)**

Module 4

- 1. Illustrate the modular design approach for designing desktop computers. (p. 2)**
- 2. Demonstrate the concept of ergonomics through the design of a table lamp. (p. 2)**

Module 5

- 1. Illustrate the changes in the design of a disposable tea cup in terms of production, use and sustainability. (p. 2)**
- 2. Describe how to estimate the cost of a table in the design stage? Show how economics will influence the engineering designs. (p. 2)**