

APJ Abdul Kalam Technological University

**B.Tech Degree Examination paper December 2023 (2019 Scheme)
EST200: Design and Engineering**

Part A

Answer all questions. Each question carries 3 marks.

- 1. Enumerate the two objectives and three constraints in the design of a table fan (p. 1).**
 - 2. List out three methods to select the best concept from many at the initial stage of design (p. 1).**
 - 3. Differentiate conventional thinking and creative thinking (p. 1).**
 - 4. List the techniques to improve the thinking process in a design team (p. 1).**
 - 5. Write down the name of the product where:**
 - (i) aesthetic is essential factor**
 - (ii) reliability is most important**
 - (iii) aesthetic is not considered (p. 1).**
 - 6. Compare prototype of a car with its model (p. 1).**
 - 7. Enumerate six features of a modular design (p. 1).**
 - 8. Concurrent engineering is better than sequential engineering—Justify (p. 1).**
 - 9. List the factors affecting the cost of a product (p. 1).**
 - 10. Enumerate the features of a sustainable product (p. 1).**
-

Part B

Answer any one full question from each module. Provide sketches wherever possible. Each question carries 14 marks.

Module 1

- 1. You are assigned to design an automatic sanitizer dispenser for your institution. Set the objective and constraints. Apply**

E ▶ ENTRI

the standard design procedure to arrive at the final concept (p. 1).

2. Explain the method of identifying the customer requirement of an umbrella and the method of finalising the product specification (p. 1).

Module 2

1. Illustrate the design thinking approach for designing a study table for kids within a limited budget. Describe the design thinking process (p. 2).
2. Illustrate three possible conceptual designs of a writing aid for a handless person and refine the concepts to obtain the best solution (p. 2).

Module 3

1. Explain the method of developing a mathematical model for a passenger lift (p. 2).
2. Assume that you have completed the design of a new model ceiling fan and a prototype is needed for testing. Communicate your idea to the production department effectively to manufacture the prototype (p. 2).

Module 4

1. Illustrate the modular design of a dining table where three different geometrical varieties can be developed as per the customer requirement (p. 2).
2. Explain the aesthetic, ergonomic and safety considerations incorporated in the design of a baby tricycle (p. 2).

Module 5

1. Describe how to estimate the cost of a chair. Identify the influence of cost on engineering design. Explain the difference in the design of a low cost chair and a high quality chair (p. 2).

2. Explain the impact of electronic gadgets on the environment and how to minimise the impact with design modification (p. 2).

