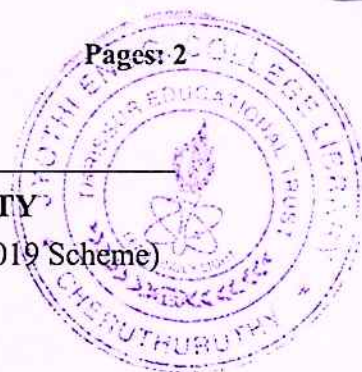


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S3 (S,FE) (FT/WP/S1PT) Examinations May/June 2026 (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 | Illustrate the process of detailing the customer requirement while designing a pencil box? | (3) |
| 2 | List out Design Thinking Process Stages. | (3) |
| 3 | Name two specific stages of a product's life cycle that designers consider to reduce environmental impact. | (3) |
| 4 | State the function of prototyping in engineering design. | (3) |
| 5 | How can designers effectively translate nature's solutions into functional and sustainable product features? | (3) |
| 6 | Describe the use of Concurrent Engineering in the design process. | (3) |
| 7 | Distinguish between Design Thinking and Divergent-Convergent in design engineering. | (3) |
| 8 | Explain modular design by a simple example of a modular product and explain one benefit it offers to the customer? | (3) |
| 9 | Using the design of a lunch box as an example, describe two distinct ergonomic considerations? | (3) |
| 10 | What is the role of ethics in design? | (3) |

PART B

(Answer one full question from each module, each question carries 14 marks)

Module -1

- | | | |
|----|--|------|
| 11 | Show the designing of a food waste storage container. Use hand sketches to illustrate the various stages of the design process. | (14) |
| 12 | List the customer requirements for designing a children's toy that promotes STEM learning. Show how the design objectives were finalized considering the design constraints? | (14) |

Module -2

- | | | |
|----|--|------|
| 13 | Design an integrated lunch cum water bottle. Illustrate the various stages involved in design thinking. Sketch the final design. | (14) |
| 14 | Many households didn't segregate waste and manage it effectively. Empathize about this design problem and arrive at a solution using the design thinking process. Illustrate the solution using sketches | (14) |

Module -3

- 15 Design a kitchen Scissors. Draw the detailed 2D drawings of the same with design detailing, scale drawings and dimensions. Use only hand sketches. (14)
- 16 Prepare a technical report for a new a new mobile application for a local restaurant chain with neat diagrams for presenting to a client. (14)

Module -4

- 17 Establish the concept of ergonomics and aesthetics through design of an office chair. (14)
- 18 Apply value engineering to a gas lighter, and design a chargeable gas lighter. Illustrate the solution using sketches. (14)

Module -5

- 19 Examine the changes in the design of a ruler scale with constraints of 1) production methods, 2) life span requirement, 3) reliability issues and 4) environmental factors. Use hand sketches and give proper rationalization for the changes in design. (14)
- 20 Describe how to estimate the cost of a candle and list the various parts. Show how the economics will influence the engineering designs. Use hand sketches to support your arguments. (14)
