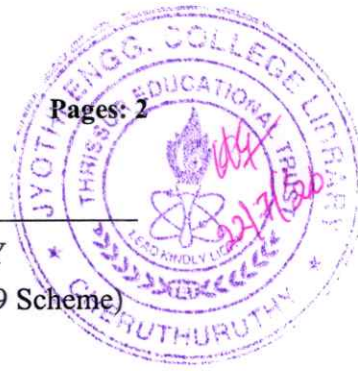


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S4 (S,FE) (FT/WP/S3PT) 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 | Explain how design can support sustainability goals. | (3) |
| 2 | Outline the significance of understanding customer requirements in design process. | (3) |
| 3 | Identify two methods used to gather user insights during the Empathize stage. | (3) |
| 4 | Compare low fidelity and high fidelity prototypes. | (3) |
| 5 | Enumerate any three points to be considered while preparing a presentation in communicating designs orally. | (3) |
| 6 | Compare digital rendering tools and hand-drawing techniques in terms of clarity and speed. | (3) |
| 7 | Apply the concept of modularity to redesign a common household item. | (3) |
| 8 | Distinguish between ergonomic and non-ergonomic features in a chair. | (3) |
| 9 | Apply sustainable design principles to redesign a plastic water bottle. | (3) |
| 10 | Distinguish between recyclable and biodegradable materials in product design. | (3) |

PART B

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

Module -1

- | | | |
|----|---|------|
| 11 | Identify the objectives, functions and constraints for designing a smart phone stand. Illustrate the various stages of the design process. Provide suitable sketches. | (14) |
| 12 | Apply the design process to a foldable chair. Include hand-drawn sketches for each stage, showing improvements based on usability and portability. | (14) |

Module -2

- 13 Analyze how user feedback changed your design for a hand soap dispenser. (14)
Include before-and-after sketches and identify what improvements were made and why.
- 14 Design a classroom chair and table using the design thinking process. Provide (14)
suitable sketches. Explain how your design improves comfort, posture, and usability.

Module -3

- 15 Draw a detailed design of a portable lamp using appropriate views and (14)
annotations. Evaluate how effectively your drawings communicate dimensions, material choice, and usability.
- 16 Design a study table for kids and communicate your design using sketches (14)
with design detailing, material selection, scale drawings and dimensions.

Module -4

- 17 Design a simple product using bio-mimicry. Illustrate the product with (14)
sketches and justify how the natural inspiration improves the product's function or sustainability.
- 18 Develop a project that addresses food waste at college canteen. Demonstrate (14)
how you collected data, propose solutions, and assess how your actions can lead to change.

Module -5

- 19 Explain how the material selection for a lunchbox affects its usability and (14)
sustainability. Discuss how the design can enhance convenience for users while minimizing environmental impact.
- 20 Describe the importance of evaluating economic considerations in product (14)
development with an example.
