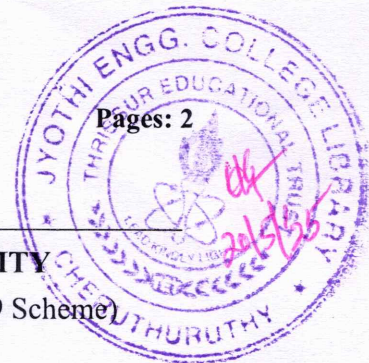


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S4 (R,S) (FT/WP) Examination April 2025 (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 | How is Engineering design different from other kinds of design ? | 3 |
| 2 | How to identify the best possible design? | 3 |
| 3 | Explain different stages in design thinking process. | 3 |
| 4 | Differentiate between Divergent thinking and Convergent thinking | 3 |
| 5 | What is the role of oral communication in engineering design? | 3 |
| 6 | Describe how prototyping helps in design process. | 3 |
| 7 | What are the advantages of reverse engineering in design | 3 |
| 8 | Differentiate between problem based learning and project based learning? | 3 |
| 9 | How do design rights protect the interests of a designer? | 3 |
| 10 | Why is environmental consideration important in design engineering? | 3 |

PART B*(Answer one full question from each module, each question carries 14 marks)***Module -1**

- | | | |
|----|--|----|
| 11 | Describe the complete engineering design process you would follow to develop a low-cost, eco-friendly cooking stove for rural areas. | 14 |
|----|--|----|

Or

- | | | |
|----|---|----|
| 12 | Design a lightweight, durable cricket helmet that enhances safety and comfort for players. Use hand sketches to support your idea | 14 |
|----|---|----|

Module -2

- 13 Apply the five stages of the design thinking process to design a school bag for primary school children. 14

Or

- 14 Illustrate how divergent and convergent thinking assist in designing a public bench for parks that suits all age groups. Use practical steps and justify your final selection 14

Module -3

- 15 Explain the general guidelines for technical communication. Justify each point with an example. 14

Or

- 16 Design an office chair and communicate your design using sketches with design detailing, material selection, scale drawings, and dimensions 14

Module -4

- 17 Design a solar-powered streetlight system for a rural area using a project-based learning approach. Explain each stage of the project development and justify your design decisions. 14

Or

- 18 Design a stackable stool inspired by the structure of honeycombs. Use biomimicry and ergonomic principles in your design. 14

Module -5

- 19 Analyze the evolution of toothbrush design over the past decades. Focus on changes in materials, manufacturing processes, ergonomics, and sustainability. 14

Or

- 20 Describe how to estimate the cost of a table in design stage? Show how economics will influence the engineering designs. 14
