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Reg No.: _____

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth Semester B.Tech Degree (S, FE) Examination January 2024 (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 the three objectives in the design of a glass bottle for Ayurvedic medicine. (3)
- 2 Describe any three constraints that can occur in the design process of a lunch box. (3)
- 3 Explain the role of divergent-convergent questioning in design thinking (3)
- 4 Explain the role of mathematics and physics in the Engineering design process (3)
- 5 What are factors to be considered in preparing technical reports to communicate a design efficiently? (3)
- 6 Distinguish between project-based learning and problem-based learning in design engineering. (3)
- 7 Describe the use of value engineering in the design process (3)
- 8 Explain how to estimate the cost of a particular design (3)
- 9 How do ethics play a decisive role in engineering design? (3)
- 10 Describe how intelligence affect in nature inspire engineering designs? (3)

PART B

Answer any one full question from each module. Each question carries 14 marks

Module 1

- 11 Discuss the design process of designing a handbag for women of the age group of 15 to 25 years. Use hand sketches to support your idea (14)
- 12 Identify the objectives, functions and constraints for designing a water level indicator. Illustrate the various stages of the design process. Provide suitable sketches (14)

Module 2

- 13 Design a parachute mechanism for the safe landing of an egg that is dropped (14)

from a height of 3 meters using an iterative design thinking process with the help of sketches

- 14 Design a water bottle that can be opened with one hand. Illustrate the various stages involved in design thinking. Sketch the final design (14)

Module 3

- 15 Design an office chair and communicate your design using sketches with design detailing, material selection, scale drawings, and dimensions (14)
- 16 Develop a technical report for a newly designed website for online training of students with neat diagrams for presenting to a client (14)

Module 4

- 17 Design a nature inspired fashionable umbrella based on a banana leaf. Use hand sketches to support your arguments (14)
- 18 Apply value engineering to a pen, and design a lightweight pen torch. Illustrate the solution using sketches (14)

Module 5

- 19 Illustrate the changes in design of disposable tea cup in terms of production (14)
- 20 Design a fan which automatically reduces speed or stops when the temperature reduces during the night for energy conservation. Use hand sketches to support your design (14)