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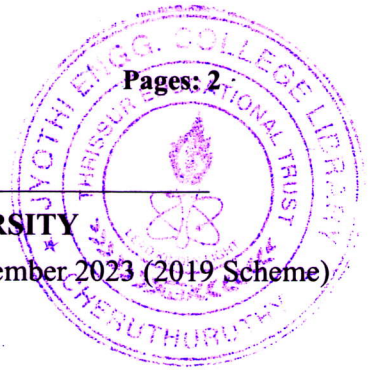
Pages: 2

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S3 (R, S) / S3 (PT) (R, S) / S1 (PT) (S, FE) Examination December 2023 (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  | Enumerate the two objectives and three constraints in the design of a table fan  | (3) |
| 2  | List out three methods to select the best concept from many at the initial stage of design   | (3) |
| 3  | Differentiate conventional thinking and creative thinking  | (3) |
| 4  | List the techniques to improve the thinking process in a design team   | (3) |
| 5  | Write down the name of the product where<br>(i) aesthetic is essential factor (ii) reliability is most important (iii) aesthetic is not considered | (3) |
| 6  | Compare prototype of a car with its model  | (3) |
| 7  | Enumerate six features of a modular design   | (3) |
| 8  | Concurrent engineering is better than sequential engineering- Justify  | (3) |
| 9  | List the factors affecting the cost of a product   | (3) |
| 10 | Enumerate the features of a sustainable product  | (3) |

**PART B**

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

**Module 1**

- |    |   |      |
|----|---|------|
| 11 | You are assigned to design an automatic sanitizer dispenser for your institution. Set the objective and constraints. Apply the standard design procedure to arrive the final concept. | (14) |
| 12 | Explain the method of identifying the customer requirement of an umbrella and the method of finalising the product specification.   | (14) |

**Module 2**

- 13 Illustrate the design thinking approach for designing a study table for kids within a limited budget. Describe the design thinking process. (14)
- 14 Illustrate three possible conceptual designs of a writing aid for handless person and refine the concepts to obtain the best solution. (14)

**Module 3**

- 15 Explain the method of developing a mathematical model for a passenger lift. (14)
- 16 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. (14)

**Module 4**

- 17 Illustrate the modular design of a dining table where three different geometrical varieties can be developed as per the customer requirement. (14)
- 18 Explain the aesthetic, ergonomic and safety considerations incorporated in the design of a baby tricycle. (14)

**Module 5**

- 19 Describe how to estimate the cost of a chair. Identify the influence of cost on engineering design. Explain the difference in the design of low cost chair and a high quality chair. (14)
- 20 Explain the impact of electronic gadgets on environment and how to minimise the impact with design modification (14)

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