

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

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

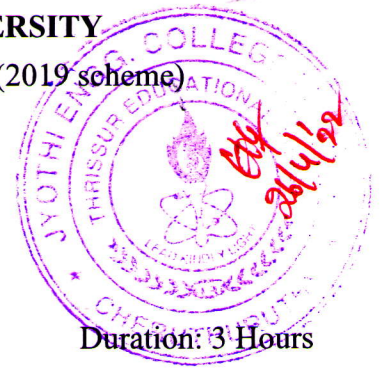
**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Third Semester B.Tech Degree Examination December 2021 (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**

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|----|---|-----|
| 1  | What are the basic vocabularies in engineering design?                      | (3) |
| 2  | How to identify the customer requirements of design?                        | (3) |
| 3  | Describe the iterative process involved in design thinking approach.        | (3) |
| 4  | Describe the importance of empathize phase in design thinking.              | (3) |
| 5  | How can a design be communicated through engineering sketches and drawings? | (3) |
| 6  | Explain the role of Prototyping in evaluating a Design.                     | (3) |
| 7  | Explain the importance of project-based learning in design engineering.     | (3) |
| 8  | Discuss the role of life cycle design approach in design decisions.         | (3) |
| 9  | What are the factors to be considered for a sustainable design?             | (3) |
| 10 | What are design rights, and how can an engineer put it into practice?       | (3) |

**PART B***Answer any one full question from each module. Each question carries 14 marks***Module 1**

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|----|---|------|
| 11 | Find the customer requirements for designing a website for an educational institution. Show how the design objectives were finalized considering the design constraints. Sketch a layout of the website showing dropdown menus. | (14) |
| 12 | Show the designing of an iron box going through the various stages of the design process. Use hand sketches to illustrate the processes.  | (14) |

**Module 2**

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|----|--|------|
| 13 | Illustrate the design thinking approach for designing a wearable technology for a college student. Describe each stage of the process. Illustrate the solution using sketches. | (14) |
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- 14 Some of the vehicle drivers do not dim the headlights when facing another vehicle at night. 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 an integrated water bottle with lunch box. Draw the detailed 2D drawings of the same with design detailing, material selection and dimensions. Use only hand sketches. (14)
- 16 Prepare a technical report for a newly designed portable ladder with neat sketches for presenting to a client. (14)

**Module 4**

- 17 Show the development of a nature-inspired design for a fashionable umbrella based on a banana leaf. Use hand sketches to support your arguments. (14)
- 18 Develop some design modification for sports utility bag, to improve its functionalities as well as product value. Sketch the design. (14)

**Module 5**

- 19 Design a sustainable piping network for reuse of water in a residential building enabling water conservation. Sketch the design. (14)
- 20 Design a door handle with a lock which is easy to use. Use hand sketches and give rationalization for the various features in the design. (14)

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