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| Roll Number:…………………………Name:………………………………. |  |
| **Fourth Semester B. Tech Degree****First Internal Assessment, April 2023****DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING****EST 100 DESIGN AND ENGINEERING** |
| **Class:S4 CSE****Date:4/4/2023** |  | **Max. Marks:50****Duration:2Hrs.** |
| **PART A (Answer all questions)**  |
| **Q. No** | **CO** | **B.T** | **Questions** | **Mark** |
| **1** | **1** | **K1** | List the different stages in a design process | 3 |
| **2** | **1** | **K1** | Describe how to finalize the design objectives | 3 |
| **3** | **2** | **K2** | Describe design thinking | 3 |
| **4** | **2** | **K1** | Differentiate convergent and divergent thinking | 3 |
| **5** | **3** | **K2** | Explain the role of mathematics and physics in design engineering process. | 3 |
| **PART B (Answer any one full question from each module)**  |
| **6** | **1** | **K3** | Show the designing of a smart watch going through the various stages of the design process. Use hand sketches to illustrate the processes | 14 |
|  |  |  | OR |  |
| **7** | **1** | **K3** | Find the customer requirements for designing a new classroom. Show how the design objectives were finalized considering the design constraints? | 14 |
| **8** | **2** | **K3** | Design a water bottle that can be opened using one hand. Illustrate the various stages involved in design thinking. Sketch the final design | 14 |
|  |  |  | OR |  |
| **9** | **2** | **K3** | Construct a number of possible designs and then refine them to narrow down to the best design for a parachute mechanism for safe landing of egg dropped from a height. Show how the divergent-convergent thinking helps in the process. Provide your rationale for each step by using hand sketches  | 14 |
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| **10** | **3** | **K3** | Describe the role of mathematical modeling in design engineering citing an example | 7 |
|  |  |  | OR |  |
| **11** | **3** | **K3** | Design a office chair and communicate your design using sketches with design detailing, material selection, scale and dimensions | 7 |