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| **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 |
|  | | | | | | | | |
| **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 |