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| ( An Autonomous Institute Affiliated to SPPU) | **ASSIGNMENT** | |
| **ACADEMIC YEAR** | 2022-2023 |
| **Alandi (D), Pune – 412105** | **SEM / TRI** | VII |
| **SCHOOL OF ELECTRICAL ENGG.** | **CLASS & DIVISION / BLOCK** | TYB.TECH  Open Elective |

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| **COURSE** | Robot Dynamics & Control | **ASSIGNMENT NO.** | 1 |
| **COURSE INSTRUCTOR** | VAISHALI A. KATKAR | **DATE** | 14/02/2023 |

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| **Que. No.** | **Question Description** | **Ma rks** | **CO**  **No.** | **BT**  **Level** |
| 1. | Industrial robots are used for myriad applications.  Assume one such industrial robot model for the open-loop swivel controller and plant of    where  is the Laplace transform of the robot’s output swivel velocity and Vi(s) is the voltage applied to the controller.   1. Evaluate percent overshoot, settling time, peak   time, and rise time of the response of the open loop  Swivel velocity to a step-voltage input.   1. Represent the open-loop system in state space. 2. Use MATLAB to simulate the system | 15 | 1 | L3 |

(**Remark:** Course Instructor to add assessment rubrics for each assignment)

1. Rubrics

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| **Criteria** | **Best quality** | **Average quality** | **Lowest quality** |
| Settling time, Percent overshoot, Peak time, rise time | Correct identification of Settling time, Percent overshoot, Peak time, rise time(03M) | Partial Identification (02M) | Incorrect answer(0M) |
| State Space representation | Correct identification of Matrix A,B,C(05M) | Incorrect identification (0M) | |
| System response | Plotting system response in MATLAB(05M) | Incorrect response(0M) | |

2.

**Course Instructor**