

**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE**

**Regular End Semester Examination – Summer 2022**

**Course: B. Tech. Branch : Electronics and Telecommunication Engineering**

**Subject Code & Name: Mechatronics (BTETPE704E)**

**Semester : VII**

**Max Marks: 60**

**Date: 24/08/2022**

**Duration: 3.45 Hr.**

**Instructions to the Students:**

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

(Level/CO) Marks

**Q. 1 Solve Any Two of the following.**

- |  |            |          |
|--|------------|----------|
| A) What are the basic elements of Closed Loop Control System         | <b>CO4</b> | <b>6</b> |
| B) Explain the Static and Dynamic Characteristics of Sensor          | <b>CO1</b> | <b>6</b> |
| C) Explain Construction and Working of LVDT and Potentiometer Sensor | <b>CO1</b> | <b>6</b> |

**Q.2 Solve Any Two of the following.**

- |  |            |          |
|--|------------|----------|
| A) Explain RTDS in Details   | <b>CO1</b> | <b>6</b> |
| B) Explain Construction and Working of eddy current and Hall Effect Sensor   | <b>CO1</b> | <b>6</b> |
| C) Define the term Rise Time, Delay Time , Steady state error and also Determine the stability of system represented by Characteristic equation $S^4 + 8S^3 + 18S^2 + 16S + 5$ . Comment on Location of roots. | <b>CO4</b> | <b>6</b> |

**Q. 3 Solve Any Two of the following.**

- |  |            |          |
|--|------------|----------|
| A) Explain Construction and Working of Strain – Gauge Sensor           | <b>CO1</b> | <b>6</b> |
| B) Discuss how PLC Logic gate System can be formed with Ladder diagram | <b>CO6</b> | <b>6</b> |
| C) Explain i) Timers ii) Latching iii) Counters                        | <b>CO3</b> | <b>6</b> |

**Q.4 Solve Any Two of the following.**

- |  |            |          |
|--|------------|----------|
| A) State Sampling Theorem and Explain Aliasing?  | <b>CO2</b> | <b>6</b> |
| B) Describe Operation of Sample and Hold Circuit   | <b>CO2</b> | <b>6</b> |
| C) Explain the Process for Building up of Model for Translational and Rotational Mechanical System | <b>CO4</b> | <b>6</b> |

**Q. 5 Solve Any Two of the following.**

- |  |            |          |
|--|------------|----------|
| A) What are the Elements in DAQ? Explain                                   | <b>CO3</b> | <b>6</b> |
| B) Explain Proportional Integral Controller with necessary circuit diagram | <b>CO5</b> | <b>6</b> |
| C) With the help of Block Diagram Explain main Components of PLC           | <b>CO6</b> | <b>6</b> |

**\*\*\* End \*\*\***