

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Semester Examination – Summer 2022

Course: B. Tech. Branch : Mechanical Engineering

Semester :VII

Subject Code & Name: BTMEC701 & Mechatronics

Max Marks: 60

Date:13/08/2022

Duration: 3.45 Hrs.

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 elements of a closed loop control system? | (CO1) | (6) |
| B) What are the various static and dynamic characteristics of a sensor? | (CO1) | (6) |
| C) How a tactile sensor works? | (CO5) | (6) |

Q.2 Solve Any Two of the following

- | | | |
|--|-------|-----|
| A) How a differential amplifier works? | (CO3) | (6) |
| B) What is the specialty of a successive approximations Analog to Digital Converter (ADC)? | (CO2) | (6) |
| C) How a Digital to Analog Converter (DAC) works? | (CO2) | (6) |

Q. 3 Solve Any Two of the following

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|--|-------|-----|
| A) Analyse the controlling action of a double-acting cylinder? | (CO6) | (6) |
| B) How the valve bodies are classified? | (CO1) | (6) |
| C) What are the applications of single acting cylinder? | (CO1) | (6) |

Q.4 Solve Any Two of the following

- | | | |
|--|-------|-----|
| A) Explain the microcontroller with a block diagram? | (CO2) | (6) |
| B) What are the various types of registers and their functions in 8085 microprocessor? | (CO5) | (6) |
| C) What do you mean by Ladder Logic? Design a Ladder Logic for a simple task of your choice? | (CO4) | (6) |

Q. 5 Solve Any Two of the following.

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|--|-------|-----|
| A) What do you mean by transfer function? Why derivative controller mode cannot be used alone? | (CO6) | (6) |
| B) Explain the response of a first order system to a step-input? | (CO5) | (6) |
| C) What is the specialty of a PID controller? Design a PID controller for temperature control. | (CO6) | (6) |

***** End *****