

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

- 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.

- 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)

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