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)**

*** End ***