Reg. No. ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code	12227

B.E. / B.Tech - DEGREE EXAMINATIONS, NOV / DEC 2023
Sixth Semester
Mechanical Engineering
20MEPC603 - MECHATRONICS
(Regulations 2020)

Duration: 3 Hours   Max. Marks: 100

PART - A (10 × 2 = 20 Marks)
Answer ALL Questions

		Marks, K-Level, CO
1.	How do you define the sensors?	*2,K1,CO1*
2.	What are the advantages of LVDT?	*2,K1,CO1*
3.	List the instruction groups in 8085.	*2,K2,CO2*
4.	Define Timing diagram.	*2,K2,CO2*
5.	List the four primary operations of a MPU?	*2,K1,CO3*
6.	Define Key Debouncing.	*2,K1,CO3*
7.	List the internal devices of DAC.	*2,K1,CO4*
8.	What are the inputs of shift register?	*2,K2,CO4*
9.	Classify stepper motor.	*2,K2,CO5*
10.	What is called synthesis?	*2,K2,CO5*

PART - B (5 × 13 = 65 Marks)
Answer ALL Questions

11.	a)	Extend the various elements present in the temperature control system used in a refrigeration system with a simple circuit.	*13,K2,CO1*
		OR	
	b)	Explain with suitable diagram about optical encoders and its types.	*13,K2,CO1*

12.	a)	Explain the Instruction set of 8085 with all the instructions in each type.	*13,K3,CO2*
		OR	
	b)	Explain the Architecture of 8051 Microcontroller.	*13,K3,CO2*

13.	a)	Explain with neat sketch microprocessor-based stepper motor control system by using 8255.	*13,K3,CO3*

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create   ***12227***

b) Explain about the following: (i) DAC interfacing. (ii) ADC. *13,K3,CO3*

14. a) Explain the factors to be considered while selecting a PLC for mechatronics system design. *13,K4,CO4*

OR

b) Summarize the mnemonics codes for various logic gates. *13,K4,CO4*

15. a) Elaborately discuss the construction and working principles of servomotor. *13,K4,CO5*

OR

b) Explain the design of a mechatronics system used in an engine management system. *13,K4,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Apply the mechatronics systems in the industrial application of pick and place robot. *15,K3,CO6*

OR

b) Categorize any three sensors used in temperature measurement and also explain the principle of any three sensors used for measuring displacement. *15,K3,CO6*