Reg. No.											

Question Paper Code	11911

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2023

Sixth Semester

Mechanical Engineering

(Common to Production 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.	What are the key elements of mechatronics system?	2,K1,CO1
2.	How do you define the sensors?	2,K1,CO1
3.	List the features of 8085.	2,K1,CO2
4.	Define Timing diagram.	2,K1,CO2
5.	Define Key Debouncing.	2,K1,CO3
6.	What is keyboard interfacing?	2,K1,CO3
7.	What are the main components of PLC?	2,K1,CO4
8.	What is a shift register?	2,K1,CO4
9.	What is a stepper motor?	2,K1,CO5
10.	What is called synthesis?	2,K1,CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	What is a sequential controller? Explain how a microprocessor based controller operates a washing machine.	13,K2,CO1
		OR	
	b)	Explain the static and dynamic characteristics of transducers.	13,K2,CO1
12.	a)	With neat sketch explain the architecture of 8085 Microprocessor.	13,K2,CO2
		OR	
	b)	Explain the addressing modes of 8085 with minimum four examples in each group.	13,K2,CO2
13.	a)	Explain the Architecture of 8255 PPI.	13,K2,CO3
		OR	
	b)	Explain the seven segment LED interface with the microprocessor.	13,K2,CO3

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

14. a) Explain the architecture of PLC and explain about its elements. *13,K2,CO4*

OR

b) What is sequencing in PLC? Also apply the actuators used in mechatronics system and draw the ladder diagram by considering the requirement for the ladder program for a pneumatic system with double solenoid valves controlling two double acting cylinders A and B if limit switches a-, a+, b-, b+ are used to detect the limits of the piston rod movements in the cylinders and the cylinder activation sequence A+, B+, A-, B- is required. *13,K2,CO4*

15. a) Elaborately discuss the construction and working principles of servomotor. *13,K2,CO5*

OR

b) (i) What are the difference between stepper motor and servo motor? *7,K2,CO5*

(ii) Illustrate the advantages and disadvantages of servomotor. *6,K2,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) Apply the mechatronics systems in an engine management system with suitable diagram. *15,K3,CO6*