Reg. No.

Question Paper Code	11839

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2023
Seventh Semester
Mechanical Engineering
(Common to Production Engineering)
ME8791 – MECHATRONICS
(Regulations 2017)

Duration: 3 Hours   Max. Marks: 100

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

		Marks, K-Level, CO
1.	What is a mechatronics system?	2,K1,CO1
2.	What is the working principle of an eddy current proximity sensor?	2,K1,CO1
3.	Explain the different types of flags in 8085.	2,K2,CO2
4.	List the Software and Hardware interrupts of 8085.	2,K1,CO2
5.	List any two applications of micro controller.	2,K1,CO3
6.	What is the significance of Interrupt Priority control register in 8051 microcontrollers?	2,K2,CO3
7.	Draw the general ladder rungs to represent a latch circuit.	2,K2,CO4
8.	List the different types of stepper motor.	2,K1,CO4
9.	List the advantages of mechatronics design over traditional design.	2,K1,CO5
10.	List the sensors used in Engine management system.	2,K1,CO5

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

11.	a)	(i) State the steps that might be present in a sequential control of a dish washer.	4,K2,CO1
		(ii) Explain the basic elements of the control system for an automatic camera.	9,K2,CO1

OR

	b)	(i) Explain the static & dynamic performance characteristics of a sensor.	9,K2,CO1
		(ii) Write short note on Thermocouple.	4,K2,CO1

12.	a)	(i) State the differences between Microprocessor and Microcontroller.	4,K2,CO2
		(ii) Explain with necessary diagrams about the architecture of 8051 Microcontroller.	9,K2,CO2

OR

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create   **11839**

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b) (i) What is Purpose of Microprocessor in a Mechanical actuation System? State with Illustrations. 4,K2,CO2

(ii) Explain about the Pin diagram of 8085 Microprocessor. 9,K2,CO2

13. a) Explain how 8255 Microprocessor helps in interfacing a Traffic light control system. 13,K2,CO3

OR

b) Describe in detail about interfacing of stepper motor control with that of Microprocessor. 13,K2,CO3

14. a) Explain the architecture of PLC in detail. 13,K2,CO4

OR

b) (i) State the advantages and disadvantages of Stepper Motor and Servo Motor. 6,K2,CO4

(ii) Devise a circuit that could be used with a domestic washing machine to switch on a pump to fill water into machine for 100s, then switch off and switch on a heater for 50s to heat the water. The heater is then switched off and another pump is used to empty the water from the machine for 100s. 7, K3,CO4

15. a) Design a Pick and Place Robot using Mechatronics elements. Also explain about the robot control. 13,K3,CO5

OR

b) What is the objective of the Engine Management system, and explain its working with a block diagram. 13,K2,CO5

PART - C (1 × 15 = 15 Marks)

16. a) Devise a Ladder diagram circuit that could be used with a conveyor belt, which is used to move an item to a workstation. The presence of item at the workstation is detected by means of breaking a contact activated by a beam of light to a photo sensor. There, it stops for 100s for an operation to be carried out before moving on and off the conveyor. The motor for the belt is started by a normally open start switch and stopped by a normally closed switch. 15,K3,CO6

OR

b) Design a mechatronics system for an automatic car park barrier system and explain with illustration. 15,K3,CO6

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create **11839**