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**Question Paper Code : 10934**

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2025.

Sixth/Seventh Semester

Mechanical Engineering

ME 8791 – MECHATRONICS

(Common to : Manufacturing Engineering/Mechanical Engineering  
(Sandwich)/Mechanical and Automation Engineering/Production Engineering)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the dynamic characteristics of simplified measuring system.
2. Name elements of feedback system.
3. Differentiate microprocessor and microcontroller.
4. Classify the types of microprocessor operations.
5. Give an example program for displaying the seven segments LED.
6. State the control word format used for interfacing switches and LEDs using 8255 PPI.
7. Draw the ladder logic diagram for NAND gate.
8. List any two applications of Counters.
9. Write the function of stepper motor.
10. Define the significant difference between traditional and mechatronics systems.

PART B — (5 × 13 = 65 marks)

11. (a) (i) Discuss the concept of shaft speed control in mechatronics approach with neat block diagram. (7)  
(ii) Explain about measurement system. (6)

Or

- (b) Describe the concept of LVDT and capacitance sensor.

12. (a) Describe the various types of instruction set in 8085 microprocessor.

Or

- (b) Explain with neat sketch about the following :

- (i) Pin diagram of 8051 microcontroller. (7)  
(ii) Program status word of 8051 microcontroller. (6)

13. (a) Describe the various operating modes of 8255 PPI.

Or

- (b) Design the temperature control system with 8255 PPI.

14. (a) Define the function of sequencing. Draw the ladder diagram for  $A - B - A + B +$ .

Or

- (b) (i) Explain about latching circuit with suitable example. (7)  
(ii) Explain about timers. (6)

15. (a) Explain the construction and working principle of stepper motor.

Or

- (b) Illustrate the traditional and mechatronics design process for windscreen wiper.

PART C — (1 × 15 = 15 marks)

16. (a) Formulate the factors to be considered for the selection of sensor. Explain in detail with any two examples.

Or

- (b) Explain the concept of Car engine management system by mechatronics approach.