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Question Paper Code : 60929

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2026.

Sixth/Seventh Semester

Mechanical Engineering

ME8791 – 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. What are the static and dynamic characteristics of sensors?
2. List the emerging areas in mechatronics.
3. Write an 8085 assembly code to swap two numbers.
4. Write an 8085 assembly code to subtract two numbers.
5. Mention the need for basic interfacing concepts with microprocessors.
6. Distinguish between ADC and DAC interfaces.
7. Identify the need of times in PLC.
8. Why counters are used in PLC?
9. What is the purpose of engine management system in mechanics?
10. List the stages of the mechatronics system design process.

PART B — (5 × 13 = 65 marks)

11. (a) Explain the operation principles of the Eddy current sensor and hall effect sensor along with their application in each.

Or

- (b) Explain the operating principles of the temperature sensor and light sensor along with its applications.

12. (a) Draw and explain in detail the architecture of 8085.

Or

- (b) Explain any four addressing modes of 8051 with any two 8051 instruction examples.

13. (a) With a neat diagram explain interfacing the 8051 with the stepper motor control.

Or

- (b) With the neat diagram explains the working of traffic control interface and keyword interface.

14. (a) Explain in detail the operating principle of internal relays along with one real-world examples.

Or

- (b) Explain in detail how to select a Programmable Logic Controller (PLC) for a specific application. How to ensure the chosen PLC meets the system's requirements?

15. (a) With a neat diagram , explain the stepper motor construction and its working principle with a mechatronic application.

Or

- (b) With a neat diagram explain the servo motor construction and its working principle with a mechatronic application.

PART C — (1 × 15 = 15 marks)

16. (a) An autonomous robot consists of a stepper motor for its hand movement. Considering this case study, draw an interfacing diagram and explain how the steep motor is controlled by a microcontroller.

Or

- (b) A car consists of an atomic temperature control unit. Considering this case study, draw an interfacing diagram and explain how the temperature is controlled by a micro controller.
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