Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 80925

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2024.

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. Differentiate sensor and transducer.

2. What is the need for mechatronics in consumer electronics?

3. Define the timing diagram of a microprocessor.

4. Discuss on microprocessor and microcontroller.

5. What is the need of ADC interface with microprocessor?

6. What are the important criteria's need to be followed while interfacing a peripheral with a microprocessor?

7. How to select the PLC for a specific application?

8. Brief on Data Handling in PLC.

9. Write the working principle of Stepper motor.

10. List the stages of mechatronic system design.

PART B — (5 × 13 = 65 marks)

11. (a) With the necessary diagrams explain the working principle of the hall effect sensor along with any two applications.

Or

(b) With the necessary diagrams explain the working principle of the temperature sensor along with any two applications.

12. (a) Draw the architecture of 8085 and explain the purpose of each block.

Or

(b) Explain the addressing modes of 8085 along with two instructions in each mode.

13. (a) With a neat sketch, explain the interfacing of traffic light control with the 8085 microprocessor.

Or

(b) With a neat sketch, explain the interfacing of seven segment LED with the 8085 microprocessor.

14. (a) Draw the ladder logic for logic gates.

Or

(b) Discuss about Timer and counter in PLC.

15. (a) Draw and explain the construction and working principle of the servo motor along with its advantages and disadvantages.

Or

(b) Discuss the case study of Automative car park barriers.

PART C — (1 × 15 = 15 marks)

16. (a) Discuss a case study about how Mechatronics is used in Engine Management System with suitable diagram.

Or

(b) Design a motor speed control circuit interfacing with a microprocessor for a medical application and explain its operation in detail.