BT-7/M-20   **37167**

MECHATRONICS
ME-403N (Opt. I)

Time : Three Hours]   [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Define the term mechatronics. Describe the role of mechatronics in industries. **5**

   (b) Differentiate between the sequential controllers and microprocessor based controllers. **10**

2. What are the ways to mention binary negative numbers ? Explain the sum-of-product method for directly obtaining the Boolean expression from the given truth table. **15**

Unit II

3. Explain the working principle of photoelectric proximity sensor. **15**

4. Explain direct control of a double-acting cylinder with a suitable pneumatic circuit. **15**

Unit III

5. What is a Kinematics chain ? List various types of cam followers. Explain them briefly. **15**

6. What are A/D and D/A converters ? Explain their basis operation with applications. **15**

Unit IV

7. What are the advantages of PLC over a relay control system ? What are the logic functions used for switches in series and in parallel ? **15**

8. Define a Robot. What are the different configurations of robots ? Discuss the working of a robotic manipulator arm with a sketch. **15**