Seat No.	

SQ - 134

Total No. of Pages : 3

B.Tech. (Part – IV) (Semester – VIII) (CBCS)
Examination - May 2025
Mechanical
MECHATRONICS
Sub. Code : 84843/68508/84950

Day and Date : Thursday, 15/05/2025 **Total Marks : 70**

Time : 10.30 am. to 01.00 pm.

Instructions : 1) All main questions are compulsory.
2) Figures to the right indicates full marks.
3) Assume if necessary Suitable Data and State Them Clearly.

SECTION I

Q. 1. A) Define Mechatronics. Explain the integration of various systems with respect to quad copter. **[5]**

B) Define sensor. Explain the use of sensors in automobiles with examples. **[5]**

OR

Explain different types of sensors used in modern Mechatronics system.

Q. 2. A) What are different signal conditioning processes? Explain any one in detail. **[5]**

B) Explain Multiplexing and demultiplexing. **[5]**

Q. 3. A) Explain combinational and sequential logic with suitable example. **[7]**

B) Draw pin diagram of 8085 microprocessor and explain in short its working. **[8]**

OR

Write short note on operational amplifier.

SECTION II

Q. 4. A) 'A PLC is a computer based controller that uses inputs to monitor a process and uses outputs to control a process using a programme.' Justify the statement. **[5]**

B) Draw ladder diagram of AND and OR gate and explain. **[5]**

Q. 5. A) Explain important functions of each of the following components of PLC: **[7]**

1) Central processing unit,
2) VO Modules
3) Programming device,
4) Power supply unit

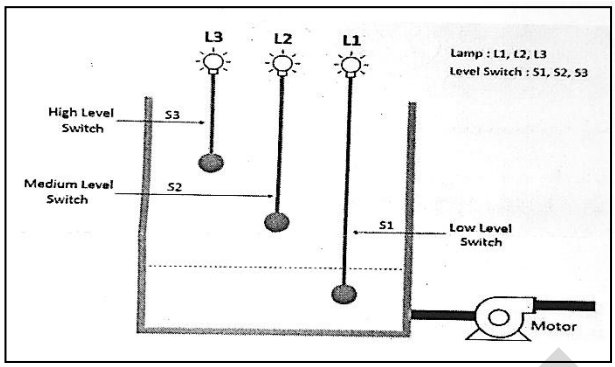
OR

Draw PLC ladder logic to control following operation :
Pressing any of the three switches A/B/C will turn LAMP ON. If switch D master control switch is ON, it turns LAMP OFF and turns BUZZER ON and none of the three switches have any control.

B) A ladder program is to be designed to control following operation for fluid level using level switches **[8]**

1) When the level is low then the motor (pump) will remain ON till high level reaches. Lamp L1 also turns ON and gives an indication of the low level. It will remain ON till it reaches a half level (medium level).
2) When the level reaches half (medium level) then the L2 lamp will turn ON and give an indication of half level. L1 goes OFF and the pump will remain ON.

3) When the level reaches to high level then the pump goes OFF and lamp L3 will turn ON.



Q. 6. A) Explain SCADA and its applications. **[5]**

B) Write note on PLC and DCS. **[5]**

OR

Explain the following machine control terminology.

1) AUTO
2) INCH
3) CYCLE
4) JOG
5) HOME