TED (15/19) – 6025
(REVISION-2015/19)

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Reg.No……
Signature…….

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, APRIL - 2024

INDUSTRIAL AUTOMATION AND MECHATRONICS

(Maximum Marks:100) (Time: 3 Hours)

PART - A
(Maximum Mark : 10)

Marks

I. Answer **all** the questions in one or two sentences. Each question carries 2 marks.

1. Name any two mechatronic products.
2. What is dead band in a sensor.
3. Differentiate between range and span of a sensor.
4. Draw the basic symbols used in ladder programming.
5. What is the use of counters in a PLC program. (5 x 2 = 10)

PART - B
(Maximum Mark: 30)

II Answer ***any five*** questions from the following. Each question carries 6 marks.

1. Explain the basic elements of a measurement system.
2. Explain the working of a turbine flow meter.
3. Explain debouncing in mechanical switches.
4. Differentiate between direction control valve, pressure control valve and flow control valves.
5. Explain the working of a process control valve.
6. What are the factors to be considered for the selection of a PLC.
7. Explain ladder programming in a PLC.

(5 x 6 = 30)

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PART – C

(Maximum Mark: 60)

(Answer ***one full*** question from each unit. Each full question carries 15 marks.)

UNIT - I

III. a) What are the advantages of industrial automation. (8)

b) Differentiate between open loop and closed loop control system. (7)

OR

IV. a) Explain fixed, programmable and flexible automation. (8)

b) What are the advantages of mechatronics system. (7)

UNIT – II

V. a) Explain with a neat sketch, the working of an eddy current sensor. (8)

b) What are the factors to be considered for the selection of a sensor. (7)

OR

VI a) Explain with a neat sketch, the working of a tachogenerator. (8)

b) Explain the working of a thermocouple for the measurement of temperature. (7)

UNIT – III

VII a) Explain with a block diagram the working of a basic hydraulic actuation system. (8)

b) Explain with a neat sketch the working of a stepper motor. (7)

OR

VIII a) Explain the working of a thyristor (SCR) as a solid state switch. (8)

b) Explain with a neat sketch the working of a gear motor. (7)

UNIT – IV

IX a) Explain the basic components of PLC with block diagram. (8)

b) Explain the possible design solutions for a timed switch. (7)

OR

X a) Explain the different data handling operations in PLC. (8)

b) What are the fault detection techniques in a mechatronics system. (7)

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