

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2018

**INDUSTRIAL AUTOMATION AND MECHATRONICS**

[Time : 3 hours

(Maximum marks : 100)

**PART — A**

(Maximum marks : 10)

Marks

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

1. Name different types of mechatronic systems.
2. List two examples of light sensors.
3. What is PLC ?
4. Define accuracy of a transducer.
5. Draw graphical representation of a 3 port 2 position solenoid operated valve.

(5 × 2 = 10)

**PART — B**

(Maximum marks : 30)

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

1. What are the advantages of Automation ? Explain.
2. Explain Programmable automation and flexible automation.
3. Explain spool type directional control valve.
4. What is turbine meter ?
5. What is shift register ?
6. Describe and explain pneumatic power supply.
7. Explain selection of sensors.

(5 × 6 = 30)

## PART — C

(Maximum marks : 60)

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

## UNIT — I

- III (a) Define mechatronics. Compare Traditional and Mechatronics systems. 7  
 (b) What are the various stages in mechatronics design process. 8

OR

- IV (a) What are the characteristics of mechatronics ? 7  
 (b) Explain Closed loop and Open loop control system with sketch. 8

## UNIT — II

- V (a) Explain working of Eddy current proximity switch with sketch. 7  
 (b) Explain thermo couple and bimetallic thermostat. 8

OR

- VI (a) Describe and explain Tachogenerator. 7  
 (b) Explain the devices to indicate liquid level in a tank. 8

## UNIT — III

- VII (a) Describe and explain a popet valve. 7  
 (b) Explain the basic working principle of a DC motor. 8

OR

- VIII (a) How a double acting Hydraulic or pneumatic cylinder is working as a linier actuator explain with sketch. 8  
 (b) Illustrate the symbols which are used to indicate various way the valves can be actuated. 7

## UNIT — IV

- IX (a) Explain general fault detection techniques in mechatronics system. 8  
 (b) Explain PLC programming with ladder diagram. 7

OR

- X (a) Explain basic structure of PLC with block diagram. 8  
 (b) Explain the possible design solution for a timed switch. 7
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