

TED (15) – 6025

Reg. No.....

(REVISION – 2015)

Signature .....

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2019

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. Define mechatronics.
2. Define transducer.
3. State the working principle of a stepper motor.
4. List the steps involved in data handling with a PLC system.
5. Define shift registers.

(5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. Differentiate traditional and mechatronic design.
2. Discuss the disadvantages of automation.
3. Compare the working of sensors and transducers.
4. Discuss the nonlinearity and stability of a transducer.
5. Discuss a hydraulic power supply system with neat sketch.
6. State the working principle of process control valves.
7. Draw the basic structure of a PLC system and discuss its components.

(5×6 = 30)

[175]

[P.T.O.]

## PART — C

(Maximum marks : 60)

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

## UNIT — I

- III (a) Define automation and explain the advantages of automation. 8  
 (b) Compare open loop and closed loop control system with their advantages and limitations. 7

OR

- IV (a) Explain the basic elements of a mechatronics system with a neat sketch. 8  
 (b) Explain the advantages and disadvantages of mechatronics. 7

## UNIT — II

- V (a) With neat sketches explain an inductive proximity sensor. List the applications of inductive proximity sensors. 8  
 (b) Explain any two fluid pressure measurement devices with neat sketches. 7

OR

- VI (a) Explain the static characteristics of a transducer. 8  
 (b) With neat sketches explain any two liquid flow sensors. 7

## UNIT — III

- VII (a) Explain spool and poppet control valves with a neat sketch. 8  
 (b) Explain a pneumatic system with a neat sketch. 7

OR

- VIII (a) Describe various pressure control valves with neat sketches. 8  
 (b) Explain the working of a single acting cylinder with a neat sketch. 7

## UNIT — IV

- IX (a) Explain the possible microprocessor based solutions for traditional systems. 8  
 (b) Describe the common hardware faults in a system. 7

OR

- X (a) Explain the working of microprocessor with block diagrams. 8  
 (b) Describe the fault finding techniques in mechatronics system. 7