TED (15) – 6025

(REVISION – 2015)

Reg. No. 1502079

Signature

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 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. Define automation.
2. Define sensors.
3. Sketch the symbol of any two control valve.
4. Draw any four symbols used in ladder diagram.
5. State the need for an automation system in an industry. (5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. Discuss the future challenges in automation.
2. Discuss the advantages of automation.
3. Describe briefly the working principle of an incremental encoder.
4. Discuss the applications of resistance temperature detector.
5. Discuss the need for the use of electrical systems as actuators for control.
6. Discuss the role of a timer in a Programmable logic converter.
7. List the factors for selecting a Programmable logic converter for a particular task.

(5×6 = 30)

Marks

PART — C

(Maximum marks : 60)

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

UNIT — I

III (a) Explain fixed programmable and integrated automation. 8

(b) Describe the advantages and limitations of open loop and closed loop control system. 7

OR

IV (a) Explain the basic elements of an automated system. 8

(b) Compare traditional and mechatronics design. 7

UNIT — II

V (a) With neat sketches explain various eddy current proximity sensors. 8

(b) Explain the working of an optical encoder with neat sketches. 7

OR

VI (a) Explain an inductive proximity sensor with neat sketches. List any two applications of inductive proximity sensor. 8

(b) Explain debouncing of mechanical switches. 7

UNIT — III

VII (a) With neat sketches describe the sequencing of double acting cylinders. 8

(b) Explain the working of thyristor with neat sketches. 7

OR

VIII (a) Discuss the need for actuators. Explain any two actuators with neat sketches. 8

(b) Describe various solid state switches. 7

UNIT — IV

IX (a) Explain the block diagram of programmable logic converter. 8

(b) Describe the techniques used in fault detection. 7

OR

X (a) Explain the working of micro controller with block diagrams. 8

(b) Describe the possible mechatronics design solutions. 7
