

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE – APRIL -2020.

INDUSTRIAL AUTOMATION AND MECHATRONICS

(Maximum Marks : 75)

[Time : 2.15 hours]

PART–A

Marks

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

1. Define mechatronics.
2. Define the term, time constant of a sensor.
3. Draw graphical representation of 4/ 2 solenoid operated spool valve.
4. What are the different forms of bipolar transistor.
5. Draw any four symbols used in ladder diagram.

(5x2=10)

PART - B

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

1. Explain reasons for industrial automation.
2. Explain about the elements of control system.
3. Describe briefly the working of variable reluctance tachogenerator.
4. List the methods that are used with temperature control systems.
5. Explain pilot operated valve with symbols.
6. Compare microprocessor and microcontroller.
7. List out the factors considered in selection of PLC.

[4x6 =24]

PART - C

(Answer **any of the three units** from the following. Each full question carries 15 marks)

UNIT I

- III** (a) Explain fixed automation and programmable automation. (8)
- (b) Explain the elements of a closed loop control system with neat sketch. (7)

OR

- IV** (a) Explain advantages and disadvantages of automation. (8)
(b) Compare traditional and mechatronics design. (7)

UNIT- II

- V** (a) Illustrate working of Eddy current proximity sensor with sketch. (8)
(b) List out the factors to be considered while selecting a suitable sensor. (7)

OR

- VI** (a) Define the following characteristics of a sensor.
(i)Sensitivity (ii)Accuracy (iii) Stability (iv)Resolution (8)
(b) Explain the working of incremental encoder with sketch. (7)

UNIT- III

- VII** (a) List the characteristics of stepper motor. Explain the working of permanent magnet stepper motor with neat sketch. (8)
(b) Explain the working of a pneumatic system with neat block diagram. (7)

OR

- VIII** (a) With neat sketch, describe pneumatic diaphragm actuator. (8)
(b) Illustrate working of DC motor with neat sketch. (7)

UNIT – IV

- IX** (a) Describe any four fault detection techniques in microprocessor. (8)
(b) Explain the principle of timed switch in mechatronics design solutions. (7)

OR

- X** (a) Explain any four methods of fault detection used in measurement, control and data communication systems. (8)
(b) Explain about methods used for input-output processing. (7)
