

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

**INDUSTRIAL AUTOMATION**

[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. State automation.
2. Define open loop controller.
3. What is a contactor in automation ?
4. Name some applications of potentiometer.
5. Define a PI Controller.

(5 × 2 = 10)

PART — B

(Maximum marks : 30)

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

1. Describe the advantages of automation.
2. Explain the types of control system.
3. Explain the working of a temperature switch.
4. Explain the working of a differential pressure air flow switch.
5. Explain the servo system with the aid of block diagram.
6. Explain the synchro system with the aid of diagram.
7. Explain PID Controller.

(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) Develop the block diagram of a process controller. 8  
 (b) What is meant by error detector ? 7

OR

- IV (a) Develop the block diagram of a level controller. 8  
 (b) Draw the connection Diagram for connecting 3 $\Phi$  Induction motor using Contactor and relay. 7

## UNIT — II

- V (a) Propose a suitable circuit diagram for a safety stop circuit of a typical Hoist Control. 8  
 (b) What are the different types of over speed conditions for Hoist ? 7

OR

- VI (a) Discuss the various types of limit switches. 8  
 (b) Explain solid state control for 3 $\Phi$  Induction motor. 7

## UNIT — III

- VII (a) Describe the working of a stepper motor with suitable diagram. 8  
 (b) Explain half stepping. 7

OR

- VIII (a) Explain stepper motor driver circuit for interfacing 8051 or PIC micro controllers. 8  
 (b) What is servo amplifier ? 7

## UNIT — IV

- IX (a) Explain Electronic PID controller. 8  
 (b) What is proportional control ? 7

OR

- X (a) Derive the final form of PID algorithm. 8  
 (b) Discuss the working of DCS. 7