

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 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. Discuss the applications of control system.
2. Differentiate between pneumatic and hydraulic control devices.
3. What is meant by freezestat ?
4. What type of modulation is used for setting the angle of rotation in servomotor ?
5. What is auto tuning in PID controller ?

(5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. Explain the necessity of automation.
2. Write the limitations automation as per your vision.
3. Explain the working of a Magnetostrictive level sensor.
4. Explain the working of a capacitance cell.
5. Categorise the various DC servo motors.
6. Compare the Torque - speed curves of stepper motor and servo motor.
7. State the applications of DCS.

(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) Illustrate the coffee maker system with the aid of block diagram. 8
 (b) Explain the role of automation in industrial field. 7

OR

- IV (a) Explain the terms :
 (i) State space (iii) State variables
 (ii) Dynamic system (iv) Controllability 8
 (b) Sketch the schematic diagram of temperature controller. 7

UNIT — II

- V (a) Propose a suitable circuit diagram for crane mechanism. 8
 (b) Describe current sensing relays. 7

OR

- VI (a) Explain the different control system components. 8
 (b) Write about Fluid thermal expansion temperature controller. 7

UNIT — III

- VII (a) Explain the working of error detector using potentiometer in DC & AC operation. 8
 (b) Demonstrate transducer with a typical example. 7

OR

- VIII (a) Explain the working of synchros as an error detector. 8
 (b) With a neat schematic diagram explain pneumatic flopper and nozzle system. 7

UNIT — IV

- IX (a) Explain Hydraulic PID controller. 8
 (b) Describe human machine interface (HMI). 7

OR

- X (a) Explain SCADA and its associated systems. 8
 (b) Compare the PLC over special purpose RTU. 7