

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER – 2021**

INDUSTRIAL AUTOMATION AND MECHATRONICS

[Maximum Marks: 75]

[Time: 2.15 Hours]

PART-A

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

- I. 1. Define automation.
2. List two advantages of mechatronics.
3. State the functions of a transducer.
4. Define an actuator.
5. Write short note about shift register. (3 x 2 = 6)

PART-B

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

- II. 1. List the advantages of automation.
2. Explain a mechatronics system.
3. Describe static and dynamic characteristics of a system.
4. Explain debouncing of mechanical switches.
5. Explain any one of the direction control valve.
6. Differentiate AC & DC motors used in mechatronic system.
7. List distinguishable characteristics of PLC compared to a personal computer. (4 x 6 = 24)

PART-C

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

UNIT – I

- III. (a) Discuss types of automation. (9)
(b) List some appliances adopted mechatronics system. (6)

OR

- IV. (a) Explain open loop & closed loop system. (9)
(b) Differentiate traditional & mechatronic system. (6)

UNIT – II

- V. (a) Describe performance terminology of sensors/ transducers. (9)
(b) What is the purpose of an encoder? Explain an incremental encoder. (6)

OR

- VI. (a) What are the factors to be considered while selecting a sensor. (9)
(b) How temperature sensors work? Explain any one system. (6)

UNIT- III

- VII. (a) How are pressure control valves classified? Explain any one. (9)
(b) Describe rotary actuators. (6)

OR

- VIII. (a) What is a stepper motor? How does it work? Explain any one. (9)
(b) Briefly describe about mechanical switches. (6)

UNIT - IV

- IX. (a) Explain basic components of PLC with block diagram. (9)
(b) Write characteristics, advantages & limitations of microcontroller. (6)

OR

- X. (a) Describe mechatronics system design approach in bathroom scales (weighing machine) (9)
(b) Name fault finding techniques in mechatronic system and explain any one. (6)
