

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE, APRIL - 2025**

INDUSTRIAL AUTOMATION

[Maximum marks: 75]

[Time: 3 Hours]

PART A

I. Answer all the following questions in one word or one sentence. Each question carries 1 mark.

(9 x 1 = 9 Marks)

		Module outcome	Cognitive level
1	What is the maximum value of firing angle of RC triggering circuit?	M1.03	R
2	Draw the symbol of TRIAC and name the terminals.	M1.01	R
3	Name the circuit used to convert dc power into ac power at desired output voltage and frequency.	M2.02	R
4	What is induction heating?	M3.03	R
5	The rectifier using SCR is called	M2.01	R
6	UPS means	M3.04	R
7	Name a device used for industrial control and automation.	M4.01	R
8	List any two math instructions used in PLC.	M4.03	R
9	List any two applications of induction heating.	M3.03	R

PART B

II. Answer any eight questions from the following. Each question carries 3 marks.

(8 x 3 = 24 Marks)

		Module outcome	Cognitive level
1	Define commutation of SCR and write any two methods of forced commutation.	M1.04	R
2	Draw the structure of IGBT.	M1.01	R
3	List any three applications of PLC.	M4.02	R
4	Sketch the input and output waveforms of step up chopper.	M2.04	U
5	List any three advantages of PLC over relays.	M4.02	R
6	Develop the ladder diagram of OR gate.	M4.04	A
7	State the principle of resistance welding.	M3.03	R
8	Draw the circuit of half wave controlled rectifier with R load.	M2.01	R
9	List any three features of AC drives.	M3.01	R
10	List any three speed control techniques of induction motor.	M3.02	R

PART C

Answer all questions. Each question carries seven marks.

(6 x 7 = 42 Marks)

		Module outcome	Cognitive level
III	Explain with a neat circuit diagram the working of a class D commutation circuit. OR	M1.04	U
IV	Describe the construction and working of SCR using necessary diagram.	M1.01	U
V	Explain the working of RC triggering circuit with circuit diagram OR	M1.03	U
VI	Explain the construction and working of DIAC with a neat diagram.	M1.01	U
VII	Explain the working of low to high cyclo converter with circuit diagram and waveforms. OR	M2.03	U
VIII	Explain the operation of Step down chopper with circuit diagram.	M2.04	U
IX	Explain with necessary diagrams about the operation of a Full Wave midpoint converter with R load. OR	M2.01	U
X	Explain the working of a parallel inverter with circuit diagram.	M2.02	U
XI	Describe any three methods of resistance welding. OR	M3.03	U
XII	Describe the operation of Offline UPS with a block diagram.	M3.04	U
XIII	Explain any four bit instructions used in PLC. OR	M4.03	U
XIV	Develop the ladder diagram of half adder circuit and explain.	M4.04	A
