

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER - 2024**

MICROCONTROLLER & PLC

[Maximum Marks:75]

[Time: 3 Hours]

PART – A

I. Answer all the following questions in one word or one sentence. Each question carries ‘one’ marks.

(9 x 1 = 9 Marks)

Module Outcome Cognitive level

1	Specify the size of internal program memory of 8051 micro controller.	M1.03	R
2	Name any two 16 bit registers of 8051.	M1.02	R
3	Identify the addressing mode used in the instruction MOV @R1, 80H	M2.01	A
4	Differentiate between the instructions RL & RLC of 8051 microcontroller.	M2.03	U
5	Define PLC.	M3.01	R
6	List any 2 advantages of PLC.	M3.03	R
7	List any two applications of PLC.	M3.04	R
8	Name the power supply lines used in Ladder programs.	M4.01	R
9	Draw the ladder logic diagram to represent a NOT gate.	M4.03	R

PART - B

II. Answer any eight questions from the following. Each question carries ‘Three’ marks.

(8 x 3 = 24 Marks)

Module Outcome Cognitive level

1	Draw the bit format of PSW register in 8051 microcontroller.	M1.02	R
2	Define interrupts in 8051 microcontroller. List the interrupts in the order of their priorities.	M1.04	U
3	Draw the general block diagram of 8051 microcontroller.	M1.02	U
4	List any six applications of microcontrollers.	M1.04	R
5	Write the content of the accumulator after executing the following instructions MOV A,# 53 H SWAP A DEC A	M2.01	A
6	Draw a connection diagram showing the interfacing of 8 LED's with 8051 microcontroller IC.	M2.04	U
7	List any three input devices and output devices that can be interfaced with PLC.	M3.03	R

8	Enumerate any six factors typically taken into account while choosing a PLC for a standard application.	M3.04	R
9	Explain the operation of a PLC with a neat diagram.	M3.03	U
10	Draw a ladder diagram to realize a DOL starter for an induction motor.	M4.04	A

PART - C

Answer all the questions from the following. Each question carries 'seven' marks.

(6 x 7 = 42 Marks)

Module Outcome Cognitive level

III.	Sketch the 8051 micro controller DIP Chip and indicate the pin functions.	M1.04	U
OR			
IV.	Explain the register structure of 8051 micro controller.	M1.02	U
V.	Two 16 bit numbers are stored in memory locations starting from 8000 H to 8004 H . (a) Explain the sequence of execution through an algorithm or flowchart. (b) Write an assembly language program to add these numbers and store the result in 8004 H & 8005 H.	M2.02	A
OR			
VI.	Explain various addressing modes in 8051 microcontroller & Identify addressing modes in each of the instructions given below: i) ADD A,@RO ii) SUBB A,#45H iii) ANL A,R2 iv) MOVC A,@A+DPTR v) RLA vi) MOV R2,45H	M2.01	R
VII.	Illustrate the block diagram of 8255 PPI.	M2.03	U
OR			
VIII.	Explain various byte level logical instructions of 8051 micro controller with examples.	M2.02	U
IX.	Draw the block diagram of PLC and explain the functions of each block.	M3.03	U
OR			
X.	Compare conventional relay panel system with a PLC based control-panel system based on any seven different aspects .	M3.02	U
XI.	Develop a ladder program to realize star delta starter for a 10 Hp induction motor.	M4.04	A

XII.	<p style="text-align: center;">OR</p> <p>A godown area is lighted with three lamps and are controlled with three switches. It is decided to control this lighting using a PLC. Develop a ladder program to control this lighting scheme.</p>	M4.04	U
XIII.	<p>Explain the math instruction set of a standard PLC.</p> <p style="text-align: center;">OR</p>	M4.03	U
XIV.	<p>Classify different PLC Programming languages. Illustrate a typical PLC program showing all basic elements such as rungs, inputs, outputs, power rails etc.</p>	M4.01	U
