Roll No. ...................

## 5th Sem. / Electrical Engg.

## Subject:- Programmable Logic Controllers and Microcontrollers

Time : 3Hrs.                          M.M. : 100

### SECTION-A

**Note:** Multiple choice questions. All questions are compulsory                    (10x1=10)

Q.1   What is the main function of a PLC?
a)   To replace manual switches in circuits
b)   To store large amounts of data
c)   To control industrial processes automatically
d)   To generate electrical power

Q.2   Which of the following is NOT a programming language used in PLCs?
a)   Ladder Logic
b)   Structured Text
c)   Python
d)   Function Block Diagram

Q.3   What type of memory does a PLC use to store the program permanently?
a)   RAM                b)   ROM
c)   EEPROM            d)   Cache Memory

Q.4   Which PLC component is responsible for executing logic and processing inputs?
a)   Power supply      b)   CPU
c)   Input Module      d)   Output Module

Q.5   What does SCADA stand for in industrial automation?
a)   Supervisory control and data acquisition
b)   System control and device automation
c)   Sequential control and data analysis
d)   Smart computer and device automation

Q.6   Which of the following is an example of a PLC output device?
a)   Sensor            b)   Motor
c)   Push Button       d)   Switch

Q.7   Which of the following best describes a micro-controller?
a)   A general-purpose computer
b)   A programmable device with CPU, memory & I/O ports
c)   A high speed gaming processor
d)   A storage device

Q.8   Which microcontroller is widely used in embedded systems?
a)   8085              b)   8051
c)   Pentium           d)   Ryzen

Q.9   Which type of memory is used to store a micro-controller's firmware?
a)   RAM               b)   ROM
c)   Cache             d)   Flash Memory

Q.10  What is the function of General Purpose Input/Output pins in a microcontroller?
a)   Power the microcontroller
b)   Connect external devices for i/p & o/p operations
c)   Store program instructions
d)   Perform arithmetic operations

## SECTION-B

**Note:** Objective type questions. All questions are compulsory. (10x1=10)

Q.11 A PLC is mainly used for _____ control in industries.

Q.12 The programming language most commonly used for PLCs is _____.

Q.13 The CPU of a PLC executes the program stored in _____ memory.

Q.14 A PLC processes inputs from sensors and generates outputs to control _____.

Q.15 A microcontroller is a compact integrated circuit designed for _____ applications.

Q.16 The main difference between a microprocessor and a microcontroller is the presence of built in _____ and I/O ports.

Q.17 The ALU in a microcontrolller is responsible for _____ and _____ operations.

Q.18 Name one commonly used microcontroller.

Q.19 Ladder Logic programming is similar to electrical relay circuit diagrams. T/F

Q.20 A PLC cannot be reprogrammed once installed. T/F

## SECTION-C

**Note:** Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Explain the limitations of Relays.

Q.22 Explain the working principle of a PLC.

Q.23 Describe the main components of a PLC system.

Q.24 What are the advantages of using a PLC over traditional relay-based control systems?

Q.25 Explain the different types of PLC programming languages.

Q.26 What are timers and counters in PLCs? Explain their working.

Q.27 What is a microcontroller? How is it different from a microprocessor?

Q.28 Explain the architecture of an 8051 microcontroller.

Q.29 Describe the various types of memory present in a microcontroller.

Q.30 What are the different types of instructions in a microcontroller?

Q.31 Explain the role of general purpose Input/output pins in a microcontroller.

Q.32 Discuss the function of timers and counters in a microcontroller.

Q.33 Describe the role of input and output modules in a PLC.

Q.34 What is SCADA? How is it used with PLCs in industrial automation?

Q.35 Explain the concept of ladder logic programming with an example of a simple start-stop motor control circuit.

## SECTION-D

**Note:** Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 Discuss the applications of PLCs in various industries in details.

Q.37 What is an interrupt in a microcontroller? Explain how interrupts improve the efficiency of micro-controllers.

Q.38 Discuss real-world applications of microcontrollers in industries, healthcare and consumer electronics.