



PLC Two Marks - Programmable Logic Controller

mechatronics (Anna University)

1. What is a PLC?

A Programmable logic controller is a microprocessor-based controller that uses a programmable memory to store instruction and to implement functions such as logic, sequencing, timing, counting, and arithmetic in order to control machines and process.

2. What are the different modules in PLC?

- CPU
- Communication module
- Digital input
- Digital output
- Analog input
- Analog output
- Pulse input

3. What is an internal relay in PLC?

Most PLCs have an area of memory allocated for internal storage that are used to hold data, which behave like relays. It can able to switch ON and Off. But this is for only internal purpose. This will not exist in the real world

4. Why we use PLC over relay logic?

The implementation of a system using electromechanical standard and timing relays would have made this control panel a maze of large bundles of wires and interconnections. And it is better to use PLC if an application needs requirements listed below:

- Flexibility in control logic changes
- Need for high reliability
- Space requirements important
- Data collection requirement
- Frequent control logic change
- Need for rapid modification
- Need for future growth

5. What are the types of PLCs available in market?

1. Micro PLCs: Micro PLCs are used in applications controlling up to 32 input and output devices, 20 or less I/O being the norm
2. Small PLCs: Small PLCs controls 32 to 128 I/O
3. Medium PLCs: 64 to 1024 I/O
4. Large PLCs: 512 to 4096 I/O
5. Very large PLCs: 2048 to 8192 I/O

6. What is main advantage of PLC?

PLC's have great advantage that it is possible to modify a control system without having to rewire the connections to the input and output devices.

7. What are the features of PLC as a controller?

The features of PLC as a controller are,

- They are rugged and designed to withstand vibrations, temperature, humidity and noise.
- The interfacing for inputs and outputs is inside the controller.
- They are easily programmed and have an easily understood programming language.

8. Who are the main PLC manufacturers?

- SIEMENS
- Allen-Bradley
- ABB
- Mitsubishi PLC
- Honeywell
- Hitachi
- Motorola
- Schneider Automation

9. Write about the architecture of a PLC?

It consists essentially of a central processing unit (CPU), memory and input/output circuitry. The CPU controls and processes all the operations within the PLC. It is supplied with a clock with a frequency between 1 and 8 MHz. It also has a bus system, memory and input/output units, a system ROM for permanent storage, RAM for the user's program and temporary buffers.

10. What is ladder programming?

The ladder programming involves each program task being specified as though a rung of a ladder. Thus, such a rung could specify that the state of switches A and B, the inputs, be examined and if A and B are both closed then a solenoid, the output is energized.

11. List down the general application of PLC for control.

1. Control of a process motor, vibrating machine
2. Control of a two pneumatic piston
3. Detecting, sorting and packing unit

12. What is the factor to be considered for selecting plc.

1. system definition
2. choosing the input and output hardware
3. Analog input / output module
4. input and output timing consideration

13. How PLC is Selected for particular task

The selection process of PLC for a particular task depends on the following factors.

- Capacity of Input and Output
- No. of Inputs and Outputs
- Types of Inputs and Outputs

- Size of memory required
- Speed and Power required of the CPU

14. Compare PLC and Computer

PLC	Computer
Ruggedised design for industrial environments	Designed mainly for data processing and calculation
Ability to operate in high temperatures and humidity	Limited environmental range
High immunity to signal noise	Optimised for speed
Integrated proprietary command interpreter	Support for multiple development environments
Limited memory	Significant and expandable memory
Optimised for single-thread processing	Multitasking capability

15. Write about the sensor and give an example.

A sensor, which responds to the quantity being measured by giving as its output a signal which is related to the quantity. Example: A thermocouple is a temperature sensor. The input to the sensor is a temperature and the output is an e.m.f. which is related to the temperature value.

16. Write about the signal conditioner?

A signal conditioner takes the signal from the sensor and manipulates it into a condition, which is suitable for either display, or in the case of a control system, for use to exercise control

17. How are programs entered?

Programs are entered into the input / output unit from a panel, which can vary from small keyboards with liquid crystals to those using a visual display unit (VDU) with keyboard and screen display. Alternatively, the programs can be entered into the system by means of a link to a PC.

18. . Write about the input / output channels?

The input/output channels provide signal conditioning and isolation functions so that sensors and actuators can be generally directly connected to them without the need for another circuitry. Common input voltages are 5 V and 24V. Common output voltages are 24 V and 240 V.

19. Write about the relay?

With the relay type, the signal from the PLC output is used to operate a relay and so is able to switch currents of the order of a few amperes in an external circuit. The relay isolates the

PLC from the external circuit and can be used for both D.C. and A.C. switching. Relays are, however, relatively slow to operate.

20. What are opto isolators?

Opto isolators are used with transistor switches to provide isolation between the external circuit and the PLC. They are also used to provide isolation.

21. What are the methods used for input / output processing?

There are two methods used for input / output processing. They are

- a. Continuous updating
- b. Mass input/output copying.