LECTURE 42

DESIGN OF PNEUMATIC CIRCUITS USING PLC

FREQUENTLY ASKED QUESTIONS

1. Define PLC as per IEC
Answer

As per IEC , PLC is defined as a digitally operating electronic system, designed for use in an industrial environment, which uses a programmable memory for the internal storage of user-oriented instructions for implementing specific functions such as logic , sequencing , timing , counting and arithmetic, to control through digital or analog inputs and outputs, various types of machines or processes. Both the PC and its associated peripherals are designed so that they can easily integrated into an industrial control system and easily used in all their intended function

2. List two disadvantages of hard wired control system
Answer:

1. The wiring of control element such as sensors, solenoids etc through relay defines hard wired control system. They are cumbersome and difficult to modify when the production requirement changes frequently.
2. They are complex and difficult to maintain and trouble shoot. Any small bug in the design could be a major problem to correct and time consuming

3. List the essential elements which defines Structure of PLC

Answer:
PLC is basically a micro computer consisting of both hardware and software. The hardware part consists of PCBs, ICs, Memory locations, Wires and power supply etc. The software is used to operate the PLC. There are two types of software programs used in PLC. One is firmware and other is user program. Firmware is supplied by the vendor and it is permanently installed. User program is the program written by the end user.

4. List PLC system components.

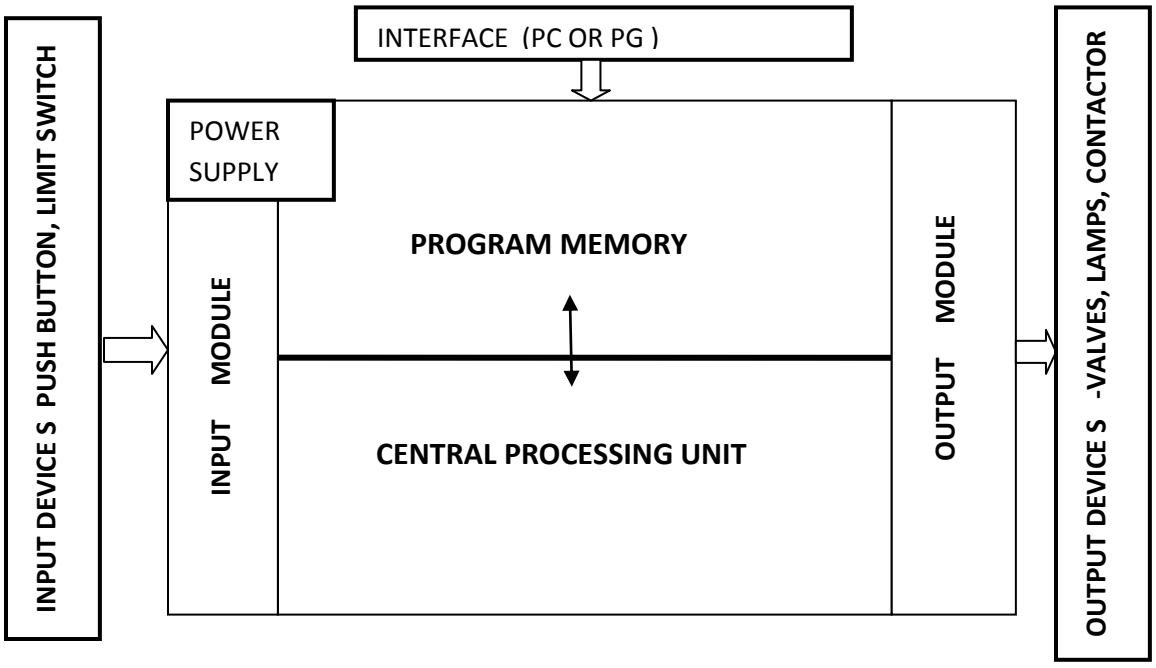
Answer:
PLC system components consist of

1. Power supply module,

2. Central processing unit(CPU),
3. Memory,
4. Input module,
5. Output module,
6. Software. – Firmware and user program

5. Draw the block diagram showing PLC system components

Answer



6. List the possible voltages used for power supply of a PLC

Answer
The power source is used for control systems and external signaling devices. The power supply is required to convert line voltage of 120 or 240 VAC to standard 24 VDC. 24 VDC is used for input – output modules. 5VDC is required for logic processor. Power supply can be integral or it is available as separate module.

7. What is the function of analog input module?
Answer

The analog input module converts analog signal from analog device such as sensors, temperature probes, pressure indicators etc to equivalent digital values using ATD converter.

8 What is the function of digital input module?
Answer

The digital input section converts signal of 240 VAC, 120 VAC, 24 VDC from digital input devices to 5V digital signals and send it to central processing unit for further processing.

9. Differentiate among load memory, work memory and system memory

Answer

Load memory	**Work memory**	**System memory**
This is used to store the user program. This can be incorporated as Volatile RAM or Flash EPROM, Programs in EPROM enable PLC to start up when power is On. Using this program PLC can interpret the instructions received by the user through key board or user section of memory.	This memory consists of some relevant portion of user programs required for running a program. Work memory is part of CPU.	These are 16 bit registers. They consists of process image input, process image output, bit memory (M),timer (T) , counter (C) etc. Bit memory stores the intermediate results, which can be accessed throughout the program for control.

10. What is program scan cycle
Answer

CPC scans and executes the main program cyclically. A program scan cycle consist of a sequential operations that include input scan , program scan and output scan. In the input scan, the CPU updates the process image input table and in output scan , CPU updates the process image output table. During the program scan, the CPU executes the program. After the completion of each scan cycle, the CPU returns to the beginning of the next cycle and again repeats the cycle. The time taken to scan one program cycle is called scan cycle time.