PART – A

1. Define a programmable logic controller.
   A programmable logic controller (PLC) is a microprocessor based controller that uses a programmable memory to store instructions and to implement functions such as logic, sequencing, timing, counting and arithmetic in order to control machines and process.

2. What are the main component parts of a PLC?
   1. Central processing unit (CPU)
   2. The input/output unit
   3. The programming device
   4. Memory unit.

3. What is the function of programming devices?

The programming device is used to enter the required program using ladder logic into the memory of the processor. The sequence of operation and ultimate control of equipment or machinery is specified and determined by ladder program.

4. List various types of PLC programming devices.
   1. Use of hand held programmer
   2. Terminal with video display unit
   3. A personal computer with appropriate software.

5. List down the types of buses required in a PLC.
   1. Data buses for communications data between elements.
   2. The address buses to read the address of locations for accessing stored data.
   3. Control buses for internal control actions.

6. What is ALU? State its function.

The ALU is responsible for data manipulation and performs arithmetic and logical operations such as addition and subtraction. In addition, the ALU contains a number of control inputs, which specify the data manipulation function to be performed. ALU is combinational logic circuit, whose output is an instantaneous function of its data and control inputs.

7. Highlight the important role of control unit.

The control unit is used to control the timing of operation and to control the units within the microprocessor to ensure that operations are carried out in the correct order.

8. What is RAM?

Random access memory is for the user's program and data storage is designed so that information can be written into or read from the memory and normally incorporated in the solid-state form contained in a integrated circuit.

9. What is meant by program scan?

A PLC does control the machine by taking repeated snapshots of the input state and reads to take the values, and energize or de-energize outputs according to the user programme. This process is known as a program scans.

10. What are counters?

Counters allow a number of occurrences of input signals to count or record the number of times some event occurs. PLCs include some form of counting element and are set to some preset number value. When this value of input pulse has been received, it will operate its contact, the normally open contacts would be closed and a normally closed contact would be opened.

11. Write down various types of counters.

1. Down counters
2. Up-counters

12. When are cascaded counters needed?

In some applications, it may be required to count events that exceed the maximum number allowable per counter instruction. The counters are programmed in series to produce an output in way that the output of first counter is programmed into the input of the second counter.

13. At what conditions master control is used?

It is often necessary to provide means of executing sections of the control logic when certain criteria are realized. They include instructions comprising the override instruction.

14. How does jump control work?

The jump instruction is an output instruction enabling part of a ladder program to be jumped over. With jump instruction, the processor scan time can be reduced by jumping over instructions not pertinent to the machine operation thereby missing intermediate program and can skip instruction when a production fault occurs.

15. Categorize data manipulation in shift registers.

1. Data transfer
2. Data comparison.

16. List down PLC programming methods.

1. Structured text
2. Ladder diagrams
3. Function block diagram
4. Sequential function charts
5. Instruction list

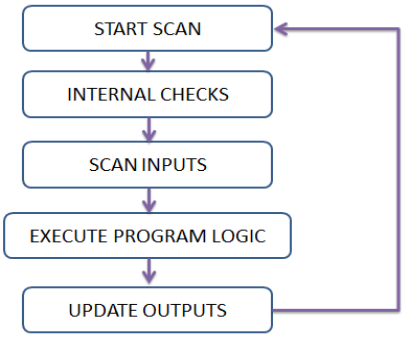
17. What are the advantages of PLC systems?

- Flexible
- Fast Response
- Handles Complicated Systems
- Simple Wiring
- Easy To Repair & Expand
- Less Expensive
- Easily Programmable

18.. Difference between PLC AND Personal computer.

PLC	PERSONAL COMPUTER
• NO KEYBOARD, MONITOR OR CD DRIVE	• POSSESS SOFTWARE AND INTERFACE CARDS
• HAS COMMUNICATION PORTS FOR I/O DEVICES	• HAS SPECIFIC IC's FOR INTERFACING WITH PERIPHERALS
• PROGRAMMED USING LADDER LOGIC. WORKS IN INDUSTRIAL AMBIENCE	• EXECUTES SEVERAL PROGRAMMES SIMULTANEOUSLY.

19. Draw the flow chart for operating cycle for PLC'S CPU



20. What are the different I/O modules in PLC?

FIXED	MODULAR
• Processor and I/O are packed together.	• Processor and I/O are divided into compartments.
• less expensive	• expensive
• not flexible	• flexible and user adjustable

21. What is sourcing and sinking?

When current flows to the output load, output module is termed as sourcing.

When current flows from the output load into the system, output module is termed as sinking.

22. What is programming? What are the various programming devices?

Programming is the method of making a system to work. This method differs from one programming language to another. The various programming devices are hand held devices, desktop console and PC.

PART –B

1. Explain the basic structure of PLC.
2. Explain in detail the input output processing of PLC systems. Explain their input and output modules.
3. Write short notes on PLC ladder programming, their symbols and functional blocks.
4. Explain with examples how logic gates are programmed using PLC ladder programming.
5. Write short notes on timers and their types used in PLC.
6. Write short notes on counters and their types used in PLC.

7. Write short notes on relays and their types used in PLC.
8. Explain briefly about the data handling in PLC.
9. What are the criteria's involved in selecting a PLC?
10. PLC ladder logic programs:
    a. LEVEL CONTROL OF A TANK
    b. STEPPER MOTOR CONTROL
    c. ACTUATOR CONTROL
    d. LED OUTPUT TO INDICATE INPUT DIGITAL SIGNAL.