

Name → Hamza

ID → 13042

Subject → Industrial
Electronics

Semester → 8th

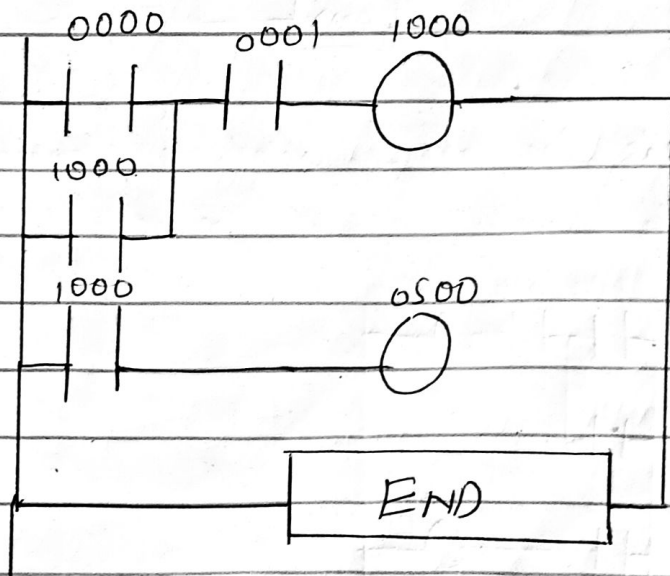
Submitte TO → Sir Saoullah
Ahmad

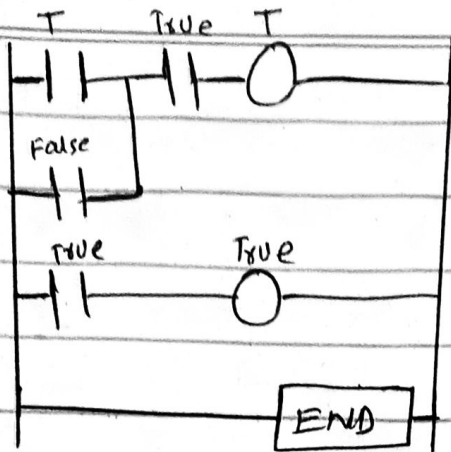
Q No 1

Answer:

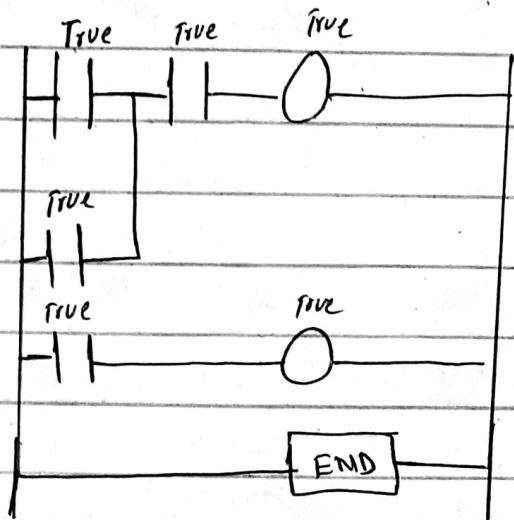
Inputs	Address
low level sensor	0000
High level sensor	0001

out put	Address
Motor	0500

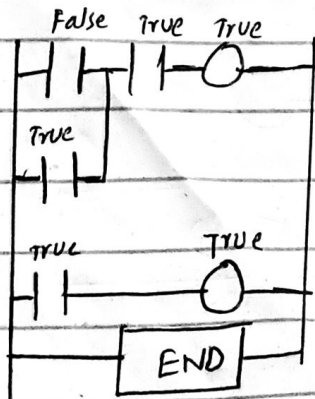




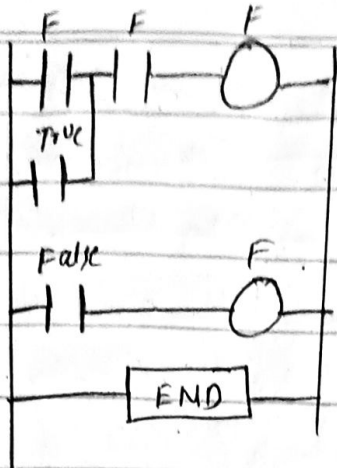
Scan 1:- Initially the tank is empty. Therefore input 0000 is True and input 0001 is also True.



Scan 2:- The internal relay is turned on as the water level rises.

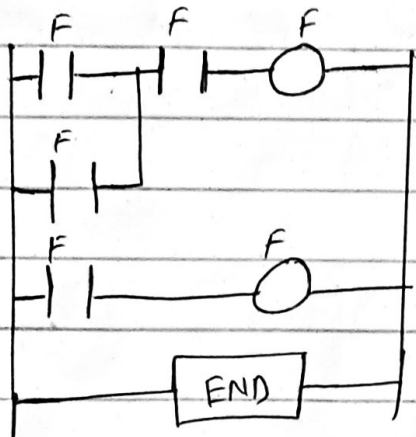


Scan 3 After scan 2 the oil level rises above the low level sensor and it becomes open.



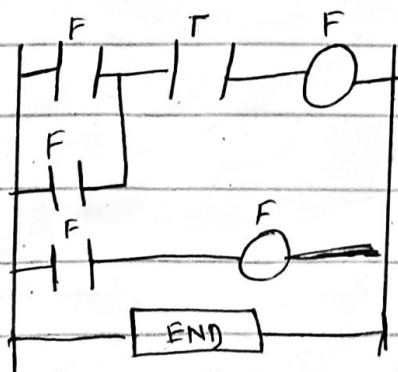
Scan 4:-

After scan 4 the oil level rises above the high level sensor. At it also becomes open.



Scan 5:-

Since there is no more true logic path output SOO is no longer energized (true) and therefore motor turns off.



Scan 6:- After scan 6 the oil level falls below the high level sensor and it will become true again.

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Here the water sprinkler system (Q00) starts to work when either temperature sensor (I00) or humidity sensor (I01) send a signal to it. In this scenario grass will be water first water the grass (Q01) for 4 second (it is assumed very small for simplicity) and then ~~to~~ vice versa.

After scan 6 oil level falls below the high level sensor and it will become True again.

QNO2 (A) Part:-

Write some benefits of Industrial Automation.

Benefits Of Industrial Automation:-

There are following some benefits of Industrial Automation is given below.

(1) Increasing Productivity:- Increased productivity means more units/day = more money.

(2) Products Produced more consistently:-

. Increased consistency = higher quality = Increased consumer satisfaction.

(3) Products produced more reliably:-

Robots can run 24 hours/day without getting tired or bored

(4) Decreased Labor expenses:- Automated System reduce the amount of people needed to produce the goods.

(5) Increasing Safety:- Increase Safty in working condition.

(B) Part →

Briefly explain the components and function of SCADA System.

Ans SCADA: SCADA is "Supervisory Control and Data ~~Application~~ Acquisition"

Function of SCADA:-

- ① SCADA is centrally monitors and controls thousands of industrial equipment, such as Motors, valves, pumps, Relays, sensors, etc.
- ② Displays current state of remote process
- ③ Displays alarms / Events log.

SCADA function in Electric power System:-

Electric power system is most complex man made system.

It is the comprises of Generation, Transmission and distribution

The losses that occur in the transmission and distribution are very large. This occurs because of inefficient safety monitoring and control devices that are persisting in present system.

Components Of SCADA System:-

Following are the components of SCADA Systems given below.

- (1) Supervisory Control
- (2) Programmable logic control
- (3) Communication Infrastructure control
- (4) Human Machine Interface control
- (5) Monolithic control system (First generation)

(6) Second Generation: Distributed Control System

(7) Third Generation: Networking Control System.

(Q3) A Part

Differentiate b/w Hardwired Control Systems and PLC Systems?

Ans

Hardwired Control System:-

- (1) The function are determined by the physical wiring
- (2) Changing the function means changing the wiring.
- (3) Can be contact-Making type (relays contactors) or electronic type (logic circuits).
- (4) Micro programmed is control by Hard wired.

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PLC Systems:-

- ① The functions are determined by a program stored in the memory.
- (2) The control functions can be changed simply by changing the program.
- (3) Consist of a control device, to which all the sensors and actuators are connected.
- (4) Control manufacturing processes.

(B) Part →

What are the function of SCADA System:-

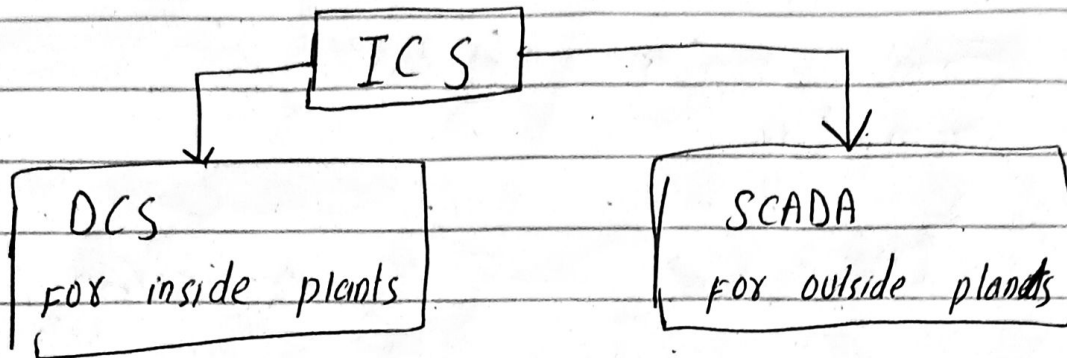
Function OF SCADA System:-

SCADA → Supervisory Control and

Data Acquisition.

SCADA is generally used for
→ Motors, Valves, pumps, Relays, sensors,
→ Also Displays current state of remote process (visualization).

① SCADA and ICS



② Electric Power And SCADA :-

The losses that occur in the transmission and distribution are very large. This occurs because of inefficient safety, monitoring and control devices that are persisting in present system. Now a days a computer control

is one of the most effective solutions for improving reliability, optimum operation, intelligent control and protection of a power system network.

(3) Fault location, isolation and Service Restoration:-

Determining fault and its restoration is difficult task in current grid system.

- With SCADA system old switches are replaced with advance remotely controllable switches.

(4) Maintaining Good voltage profile:-

- An appropriate schedule for switching ON/OFF of capacitor banks and raise lower voltage.

(5) Load Balancing:- This function will →



enable the system to calculate total load and distribute or balance equal load among available transformers and the feeders in proportion to their capacities.

(6) Load Control:

During peak hours load need to be ~~send~~ shed for long durations. A restriction and control schedule is worked out based on which of the loads at different substations are shed on a rotation basis.

(7) Energy accounting: This function helps to predict load patterns at the system, which helps in planning expansion.

(8) Improved Operation Meet Demands.