A238 Ali 11440

"Industrial Electronics"

Q1

Sol Here we want the fill motor to pump lubricating oil into the tank until the high level sensor turns on. At that point we want to turn off the motor until the level falls bellow the low level sensor Then we should turn on the fill motor and repeat the process.

Inputs	Address
Low Level sensor	0000
High level sensor	0001

Input	Address
motor	0500

Internal utility RDAY

1000

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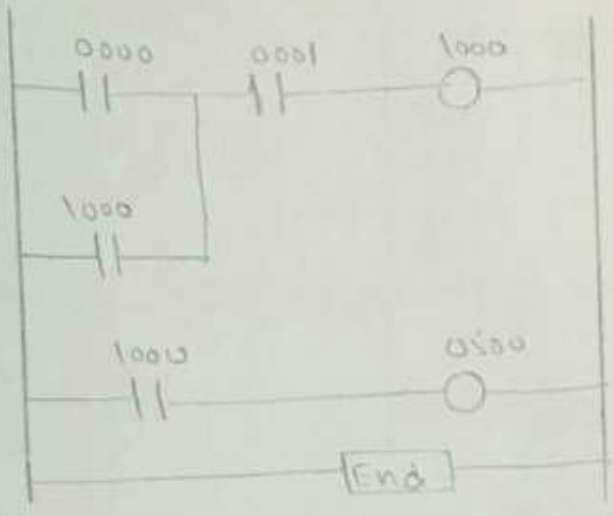
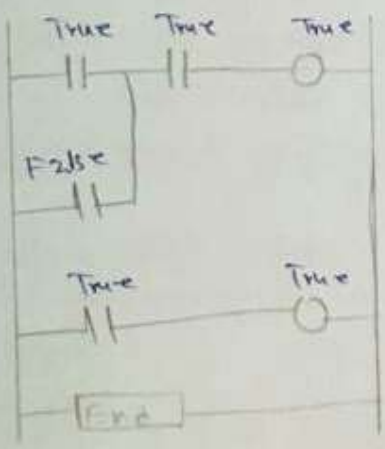
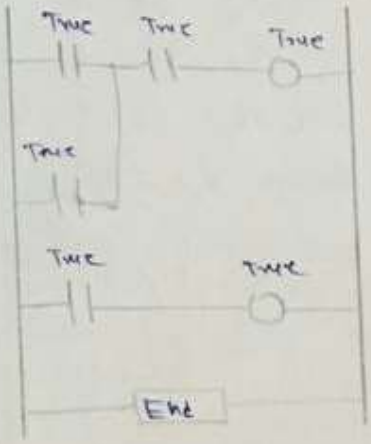
Ladder diagram





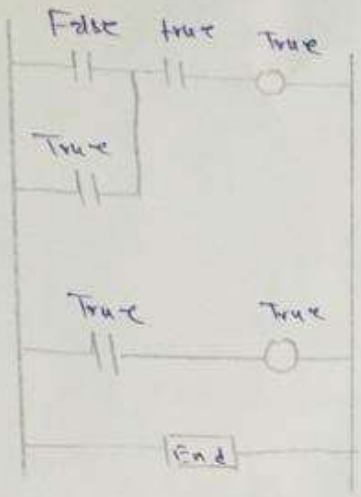


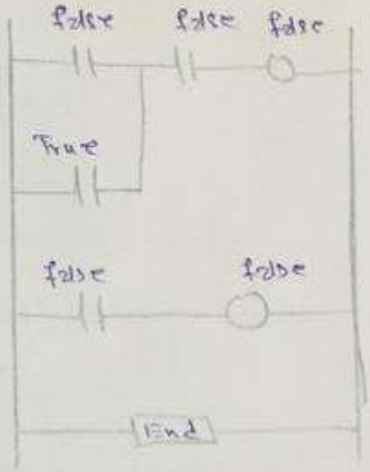
Scan 1

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.



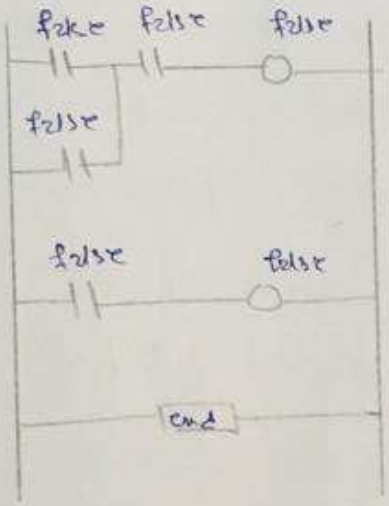


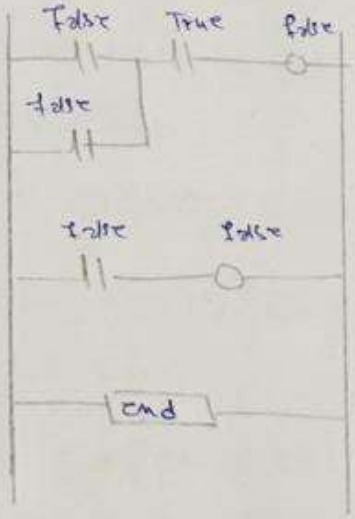
Scan 3

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 nomore true Logic Path, output 500 is no Longer energized (true) and ~~the~~ therefore the motor turns off.

Scan 6

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

Q2 A | Write some benefits of industrial Automation.

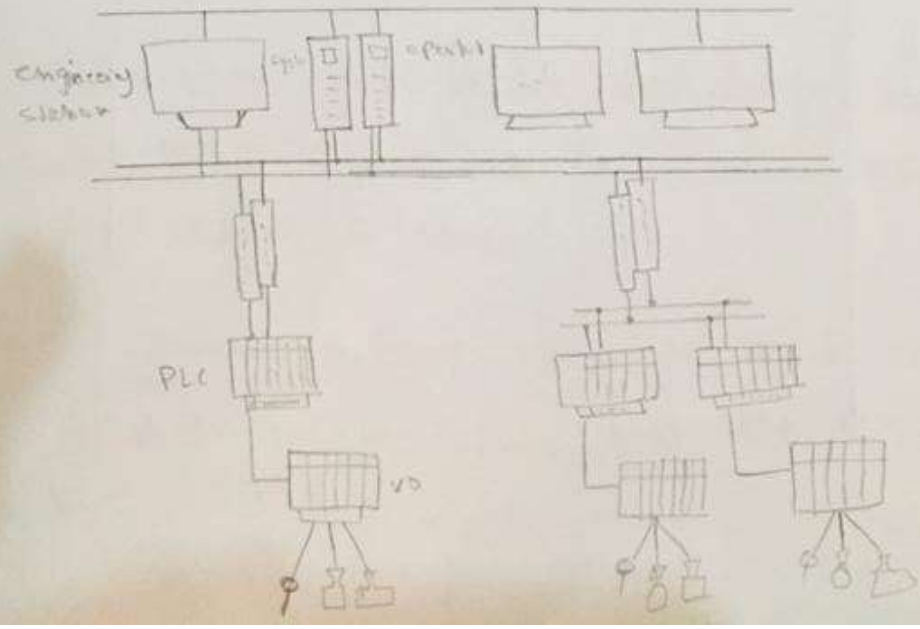
Ans
- Increasing Productivity
  Increased Productivity - more units/day - more money
- Products Produced more consistently
  - Increased consistently - higher quality - Increased consumer satisfaction
  - Example A bottled soft drink such as a Coke or a Pepsi always tasts the same no matter wher or when you purchase it. Consumers count on this.
- Products Produced more reliably
  - robots can run 24 hours/day without getting tired or bored
- Decreased labor expenses
  - Automated systems reduce the amount of people needed to produce the goods
- Increasing safety in working ~~condition~~ conditions

Q2 B | Azaz Ali 11440 (5)

Briefly explain the components and fuction of SCADA system.

Ans Components of SCADA system.

There are many parts or components of SCADA system. which include hardware (input and output) controllers. networks user interface. communications equipment and software All together the term SCADA refers to the entire central system. the central system usually monitors data from various sensors that are either in close proximity or off site (Sometimes miles away).



Function of SCADA

A SCADA system performs four function

① Data acquisition
② Networked data communication
③ Data presentation
④ Control

These function are performed by four kinds of SCADA components

① Sensors (either digital or analog) and control relays that directly interface with the managed system.

② Remote telemetry units (RTUs) these are small computerized units deployed in the field at specific sites and location.

③ SCADA master units. these are larger computer consoles that serve as the central processor for the SCADA system.

④ The communications network that connects the SCADA master unit to the RTUs in the field.

Q3 A Differentiate between hardwired Control system and PLC system.

Ans Hardwired control system

- The function are determined by the Physical wiring.
- Changing the function means changing the wiring.
- Can be contact-making type (relays. contactors) or electronic type (logic circuits) PLC systems
- The function are determined by a Program stored in the memory.

The control function can be changed

- Simply by changing the Program.
- Consist of a control device to which all the sensors and actuators are connected.

Q3 B | What are the function of SCADA systems.

Ans SCADA Function

- Centrally monitors and controls thousands of industrial equipment such as
  - Motors . Valves . Pumps . Relays . Sensors . etc
- Displays current state of remote process (visualization)
- Displays alarms / Events log.