IQRA National University, Peshawar
Department of Electrical Engineering
Spring 2020
Elective 5 (Power).
Elective 4 (Electronics).
Industrial Electronics
Terminal Examination

Name: Raham zeb

Reg.No: 13074
Instructor: Engr. Sanaullah Ahmad

Total Marks : 50
Attempt All Questions.

Question No 1.   10

A. Consider a lubricating oil tank i13141n Industrial Plant having 2 sensors, one is put near to the bottom and one near to top, to fill the tank, motor A will pump oil to tank until the high level sensor turns on, at that point the motor A turns OFF. Motor A is turned ON when the level fall below the low level sensor. Explain the states of PLC operating cycle with help of neat ladder diagrams. **CLO-3**

Question No 2   20
A. Write some benefits of Industrial Automation **CLO-2**
B.   Briefly explain the components and functions of SCADA system **CLO-2**

Question No 3   20
A. Differentiate between Hardwired control systems and PLC system **CLO-3**
B. What are the function of SCADA systems **CLO-2**

.Good Luck.

Question No 1. A.

Consider a lubricating oil tank in Industrial Plant having 2 sensors, one is put near to the bottom and one near to top, to fill the tank, motor A will pump oil to tank until the high level sensor turns on, at that point the motor A turns OFF. Motor A is turned ON when the level fall below the low level sensor. Explain the states of PLC operating cycle with help of neat ladder diagrams.

Ans; For the process given below explain and draw ladder diagrams of each steps involved to control a lubricant tank in a plant.

•We are controlling lubricating oil being dispensed from a tank. This is possible by using two sensors. We put one near the bottom and one near the top, as shown in the picture below

•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 below the low level sensor. Then we should turn on the fill motor and repeat the process.
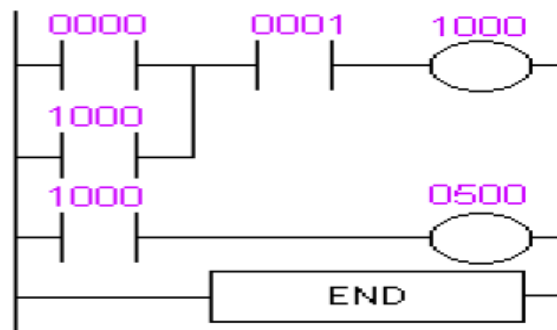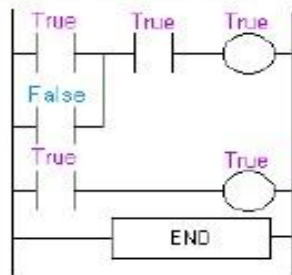

Dispensing oil from a tank
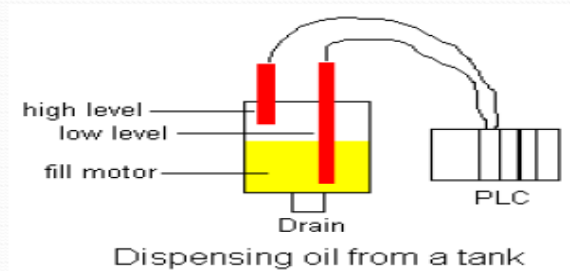
| Low level sensor | 0000 |
| High level Sensor | 0001 |

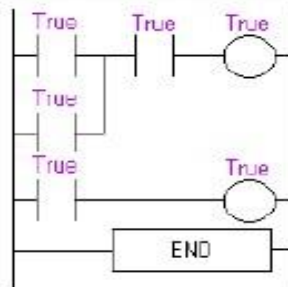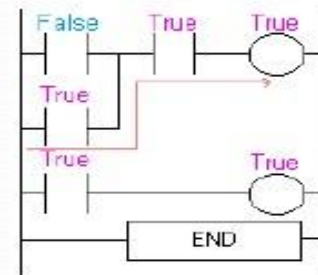| Output | Address |
| Motor | 0500 |

Internal Utility Relay

1000

The Ladder Diagram

Scan 1

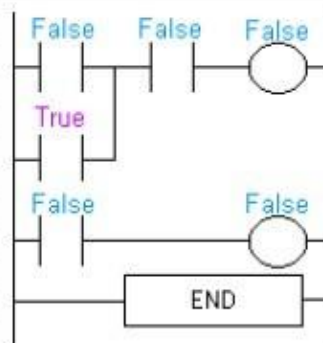Initially the tank is empty. Therefore, input 0000 is TRUE and input 0001 is also TRUE

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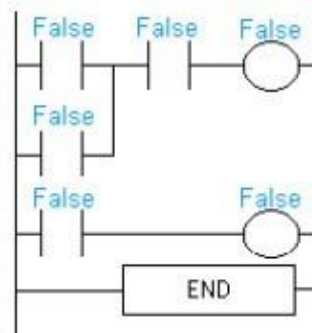
The internal relay is turned on as the water level rises.

Scan 3

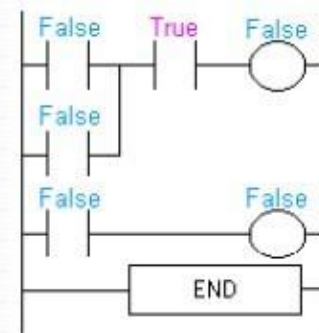After scan 2 the oil level rises above the low level sensor and it becomes open. (i.e. FALSE)

Scan 4

After scan 4 the oil level rises above the high level sensor at it also becomes open (i.e. false)

Scan 5

Since there is no more true logic path, output 500 is no longer energized (true) and 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.

Question no 2:-
   Part "A": Write some benefits of industrial Automation.

Ans:-
   Benefits of industrial Automation:-

⇒ Increasing productivity
             -increased productivity = more-
     -units/day = more money

⇒ products produced more consistently.
         -increased consistency = higher quality =
increased consumer satisfaction
    Example - A bottled soft drink such as
a coke or a pepsi always tastes the
same no matter where 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 conditions.

Question no 2:-

part "B":- Briefly explain the Components and function of SCADA System.

ANS:-

Function of SCADA:

① SCADA is Centrally members and Controls thousands of Industrial equipment, Such as Motors, valves Pumps, Relays, Sensors etc.

② Displays Current state of remote process.

③ Displays atoms / Events leg.

SCADA Function in Electric power Systems

Electric Power System is most Complex man made System.
It is the compresses of Generation Transmission and distribution.

The losses that occur in The tremission and distribution. are very large. This occurs because of inefficient safety monitoring. and control devices That are Pressisting in Present Systen.

Component of SCADA System:

Following are the Components of SCADA System given below.

Raham Zeb (5) ID= 13074

1. Supervisory Controll.

2. Programmable logic Contooll.

3. Communication infrastare Controll.

4. Human Machine interface Controll.

5. Monolithic Control System (first generation

Question no 3:-

part "A":- Differentiate between hardwired control system and PLc system.

Ans:- Hardwired control systems:-

- The functions 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 functions are determined by a program stored in the memory.

- The control functions can be changed simply by changing the program.

- Consist of a control device, to which all the sensors and actuators are connected.

Question no 3:-
     part 'B':- what are the function of
         scada system?

Ans:-

- 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.