Assignment – Digital Electronics IE2010

Release date : 04th Oct 2023

Dead Line : 19th Oct 2023 @ 00:00 hrs

Marks Allocated : 100%

Weightage : 10% of Over all Marks

Scenario

A house has a overhead tank of 1000 L at its maximum level to store the water . An electric water pump is used to fill this overhead tank from the underground storage which has the maximum capacity of 3000 L The pump operation has to automated under the following operation conditions .

1. The pump should operate when water level of overhead tank falls below the 750 L provided that the minimum water level of underground storage shall be 1000 liters
2. When the water level of the Overhead tank reaches 1000 L level , supply to the motor shall be switched off .

Installed devices

1. Senser to detect Maximum Water level of Overhead tank ( Input A)
2. Senser to detect Minimum Water Level of Overhead tank ( input B )
3. Senser to detect Minimum Water level og Overhead tank ( input C)

Assumptions

1. Input A , B, C considered as switches to control the electric water pump
2. Switch open can be considered as “0 “ and Switch Close can be considered as “1”
3. Output of three switches will be fed as input (s) to Motor – denoted as F

Tasks

1. Draw a schematic or any other diagram to depict above scenario and briefely explain ( 25Marks )
2. Write a truth table for out put F using A, B, C ( 25 Marks )
3. Derive the Expression for F in a simplified way .using NAND gates ( 10 Marks)
4. Write a lab report on how you can implement the above using the labs you have studied ( Demonstration is not required but Diagrams are required ) and upload ( 30 Marks)
5. What might be the reasons for not stating a sensor for detecting maximum water level of Underground storage

End