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 .

a) 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
b) When the water level of the Overhead tank reaches 1000 L level , supply to the motor shall be switched off .

Installed devices

a) Senser to detect Maximum Water level of Overhead tank (Input A)
b) Senser to detect Minimum Water Level of Overhead tank (input B)
c) Senser to detect Minimum Water level og Overhead tank (input C)

Assumptions

a) Input A , B, C considered as switches to control the electric water pump
b) Switch open can be considered as “0 “ and Switch Close can be considered as “1”
c) 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