Department of Computer Engineering
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CO221: Digital Design | Lab 02

Date - 27/02/2020

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1. Connect the integrated circuits packages containing following gates on a breadboard and verify the functionality of them by comparing with the truth table.

    a) NOT gate (Inverter)
    b) 2 input OR gate
    c) 2 input NAND gate

2. A room has two switches A and B to light a bulb. If B is closed while A is open, the bulb should NOT light. If B is open and A is closed, again the bulb should NOT light. But if both A and B are closed or A and B are both open, the bulb should light. While representing switches A and B as logic variables write a Boolean equation for the circuit to light the bulb. Implement the circuit using AND, OR and NOT gates and verify the functionality using the truth table.

3. A logic circuit has to be designed to automatically light a battery operated bulb at **night** when the **main electricity supply is cut off**. Further, in any situation it should be possible to light the bulb when a certain button is pressed. The circuit has three inputs A, B, C and one output F. The representation of logic variables are as follows.

    A = 0 : Button is not pressed
    A = 1 : Button is pressed
    B = 0 : Noon
    B = 1 : Night
    C = 0 : Main electricity supply is cut off
    C = 1 : Main electricity supply is available

    When the output F = 0, the bulb is off and when F =1 bulb lights up.

    Implement the logic only using 2-input AND, OR, NOR, NAND gates and 1-input NOT gates and verify the functionality.