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DATEOFPERFORMANCE: *16.09.2020*

BRANCH : CSE

SECTION / GROUP : 23 "B"

SUBJECT: *Digital Electronics*

TASK TO BE DONE:

(a) Design a two way switch for room light(XOR).

(b) Design a multiplayer game trigger mechanism (NOR).

REQUIREMENTS:

(i) 7402(NOR)IC.

(ii)7486(XOR)IC.

(iii)5V Power Supply.

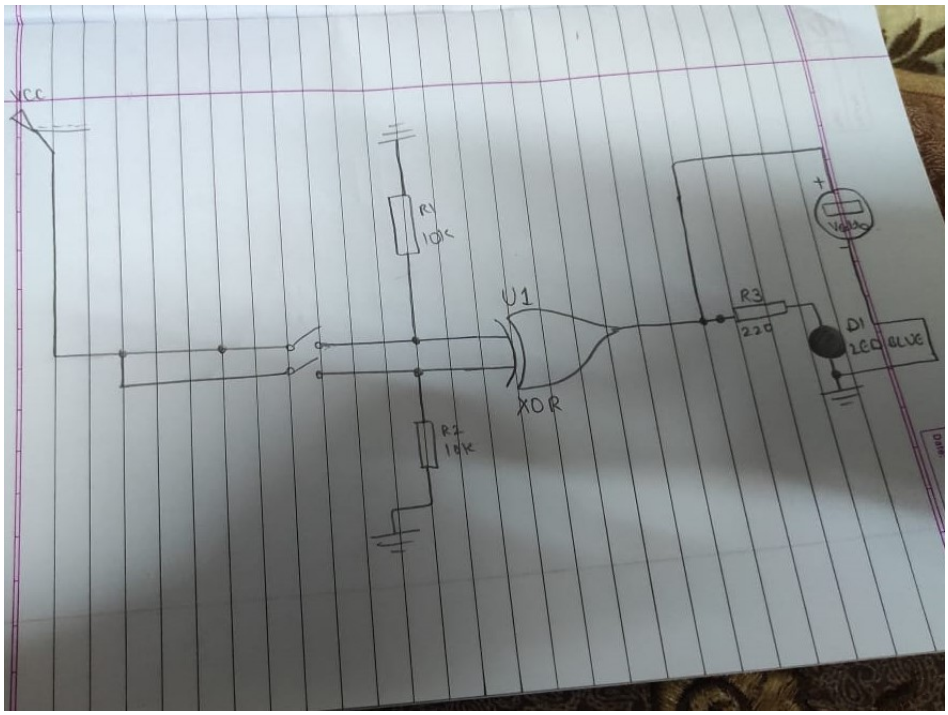
(iv) Breadboard.

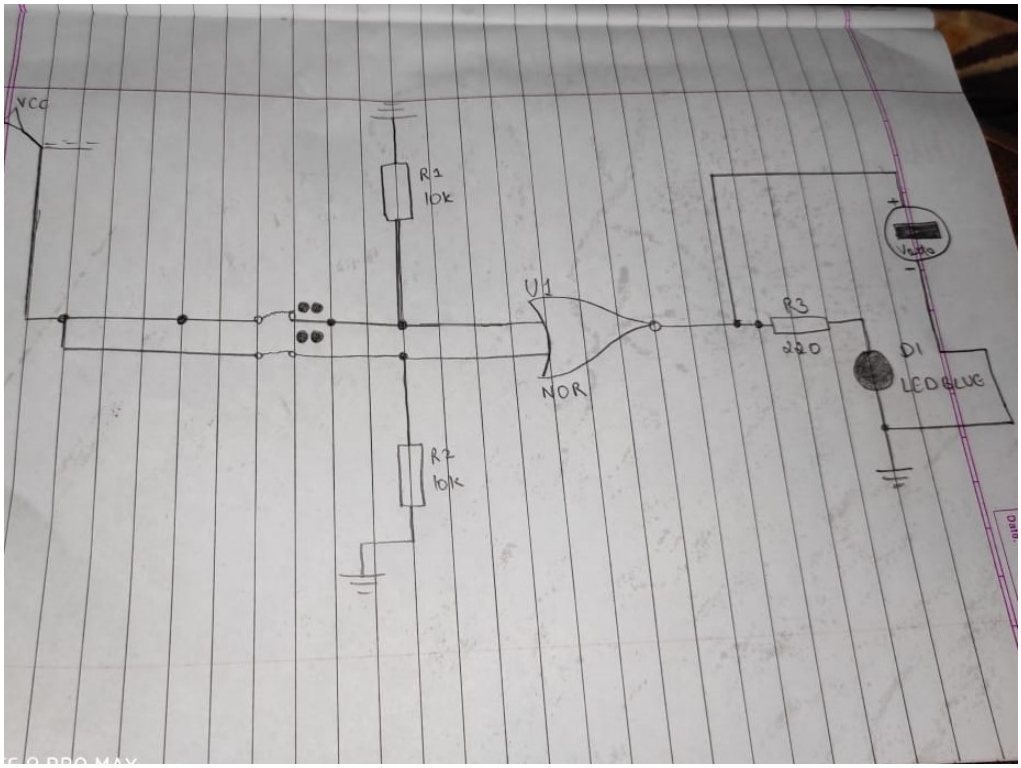
(v) Connecting wires.

(vi) Simulation software.

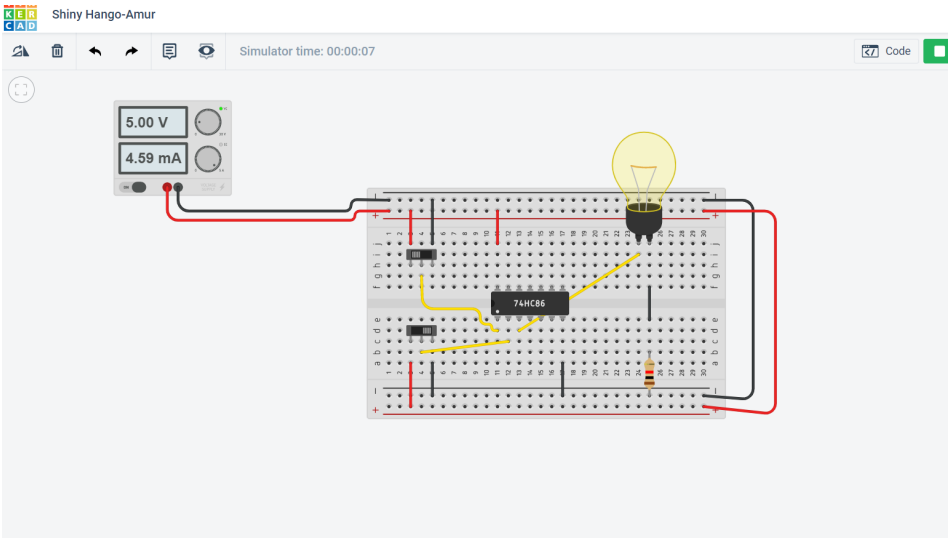
(vii) Windows10 PC.

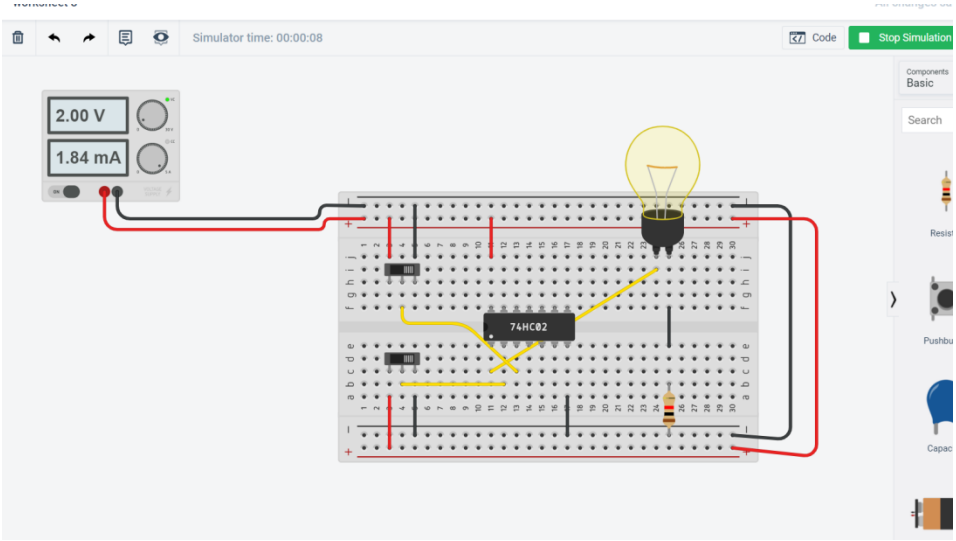
CIRCUIT DIAGRAM / BLOCK DIGARAM:





SIMULATION RESULTS:





(i) In case of two-way switch for room light(XOR Gate) bulb will glow when only one switch is on.If both the switches are on then they will not glow and if both the switches are off then it will also not glow.

(ii) In case of multiplayer game-trigger mechanism(NOR Gate) LED will glow when only one switch is on.If both the switches are on then they will not glow and if both the switches are off then it will also not glow.

CONCEPT USED:

(i) In case of two way switch for room light XOR Gate is used as The Exclusive-OR Gate function, or Ex-OR for short, is achieved by combining standard logic gates together to form more complex gate functions that are used extensively in building arithmetic logic circuits, computational logic comparators, and error detection circuits. The Exclusive-OR Gate is widely available as a standard quad two-input 74LS86 TTL gate or the 4030B CMOS package.The output of an Exclusive-OR gate ONLY goes "HIGH" when its two input terminals are at "DIFFERENT" logic levels with respect to each other. An odd number of logic "1's" on its inputs gives a logic "1" at the output. These two inputs can be at logic level "1" or at logic level "0" giving us the Boolean expression of:

$$Q = A'B + AB'$$

(ii) In case of multiplayer game trigger NOR Gate is used.The Logic NOR Gate is a combination of the digital logic OR gate and an inverter or NOT gate connected together in series. he inclusive NOR (Not-OR) gate has an output that is normally at logic level "1" and only goes "LOW" to a logic level "0" when ANY of its inputs are at logic level "1". The Logic NOR Gate is the reverse or

"Complementary" form of the inclusive OR gate. The NOR gate can also be classed as a "Universal" type gate. NOR gates can be used to produce any other type of logic gate function just like the NAND gate and by connecting them together in various combinations the three basic gate types of AND, OR, and NOT function can be formed using only NOR gates.

LEARNING / OBSERVATION :

1. In case of two-way switch for room light :

In case of two-way switch for room light(XOR Gate) bulb will glow when only one switch is on.If both the switches are on then they will not glow and if both the switches are off then it will also not glow.

2.In case of multiplayer game trigger mechanism :

ii) In case of multiplayer game-trigger mechanism(NOR Gate) LED will glow when only one switch is on.If both the switches are on then they will not glow and if both the switches are off then it will also not glow.

TROUBLESHOOTING :

Problem occured during the experiment is that on hogh voltage IC was bursted then I added resistorin it which prevents IC to get blast.