Experiment No. 6 b) **Date: 28.01.2021**	**6. b) STAIRCASE WIRING**
Name of the candidate: **Register Number:** **Date of Experiment :**	**Debarghya Barik** **RA2011026010022** **28.01.2021**

Aim:

To control a single lamp from two different places.

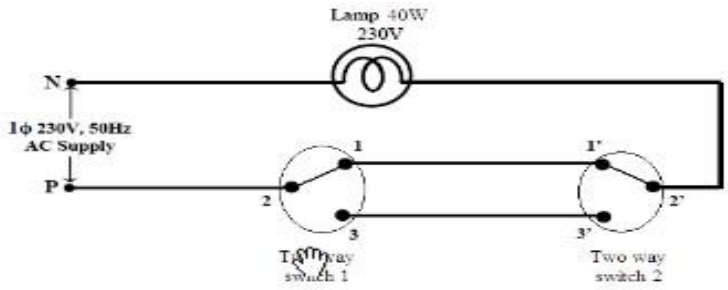
Apparatus Required:

S.No	Components	Quantity/ Range
1	Incandescent Lamp	1(230V,40W)
2	Lamp holder	1
3	Two way switches	2 (230V, 5A)
4	Connecting Wires	As required

Tools Required:

Wire mans tool Kit - 1No.

Circuit Diagram:



Theory:

1. A two way switch is installed near the first step of the stairs. The other two way switch is installed at the upper part where the stair ends.
2. The light point is provided between first and last stair at an adequate location and height if the light is switched on by the lower switch. It can be switched off by the switch at the top or vice versa.
3. The circuit can be used at the places like bed room where the person may not have to travel for switching off the light to the place from where the light is switched on.
4. Two numbers of Two-way switches are used for the purpose. The supply is given to the switch at the short circuited terminals.
5. The connection to the light point is taken from the similar short circuited terminal of the second switch. Other two independent terminals of each circuit are connected through cables.

Procedure:

1. Give the connections as per the circuit diagram.
2. Verify the connections.
3. Switch on the supply.
4. Verify the conditions.

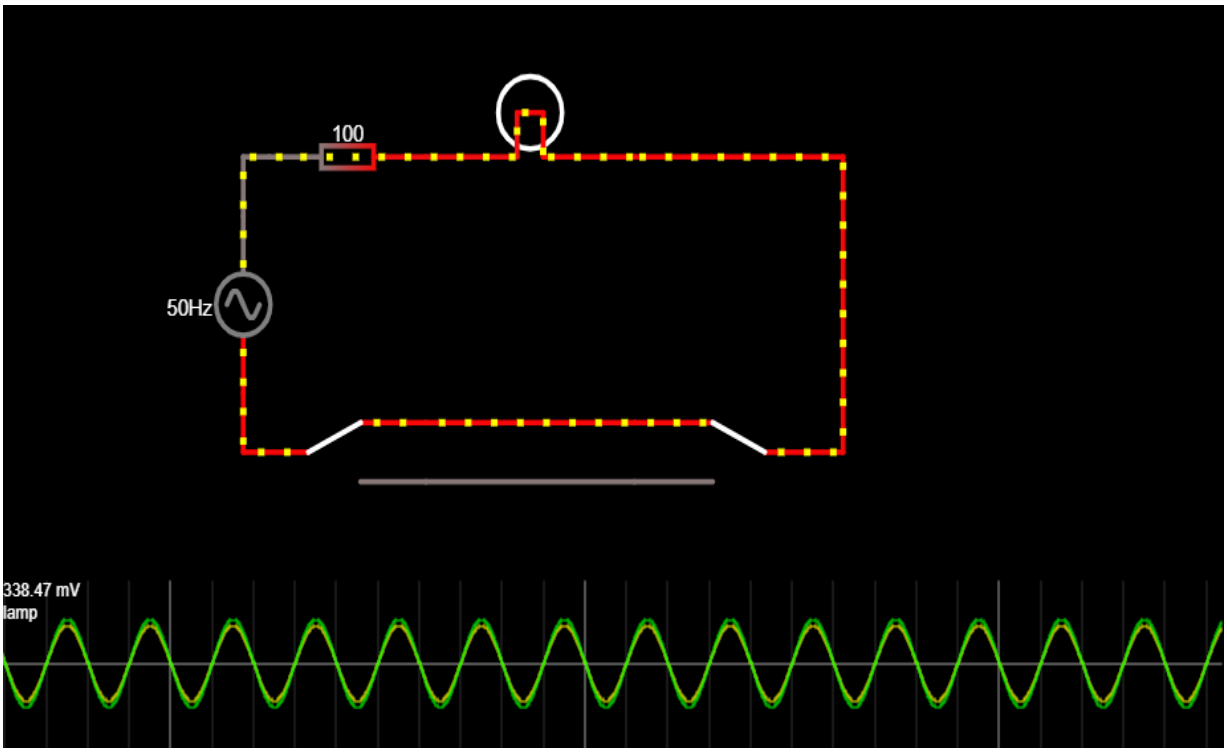
Tabulation:

Position of switches		Condition of lamp
S1	S2	

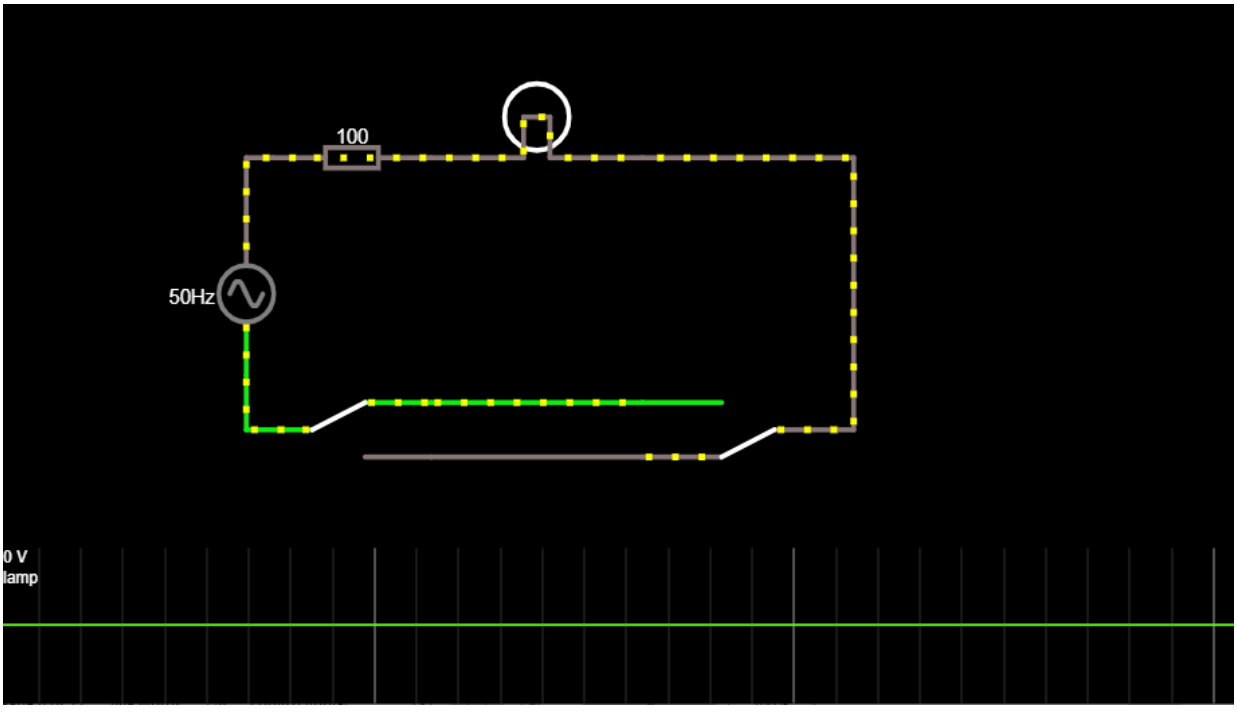
TABULATION:

POSITION OF SWITCHES		CONDITION OF LAMP
S1	S2	
1	1’	GLOWS
1	3’	DOESN’T GLOWS
3	1’	DOESN’T GLOWS
3	3’	GLOWS

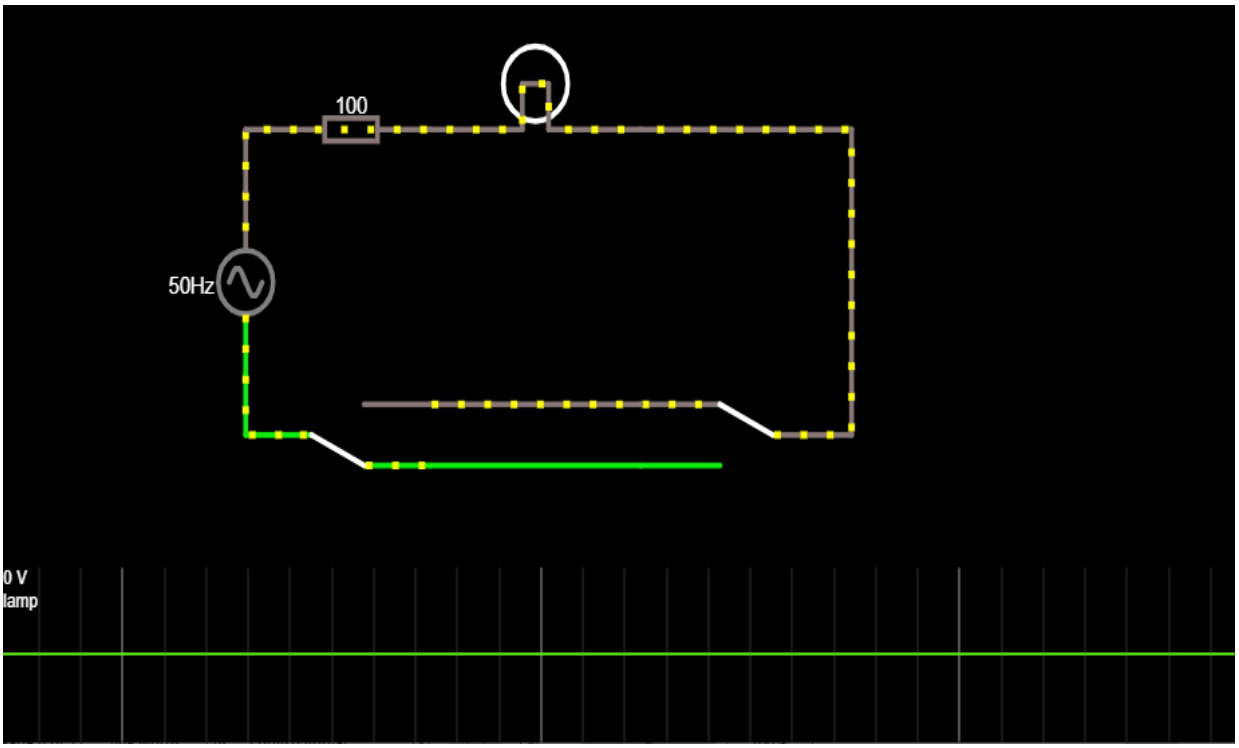
Circuit Diagrams:



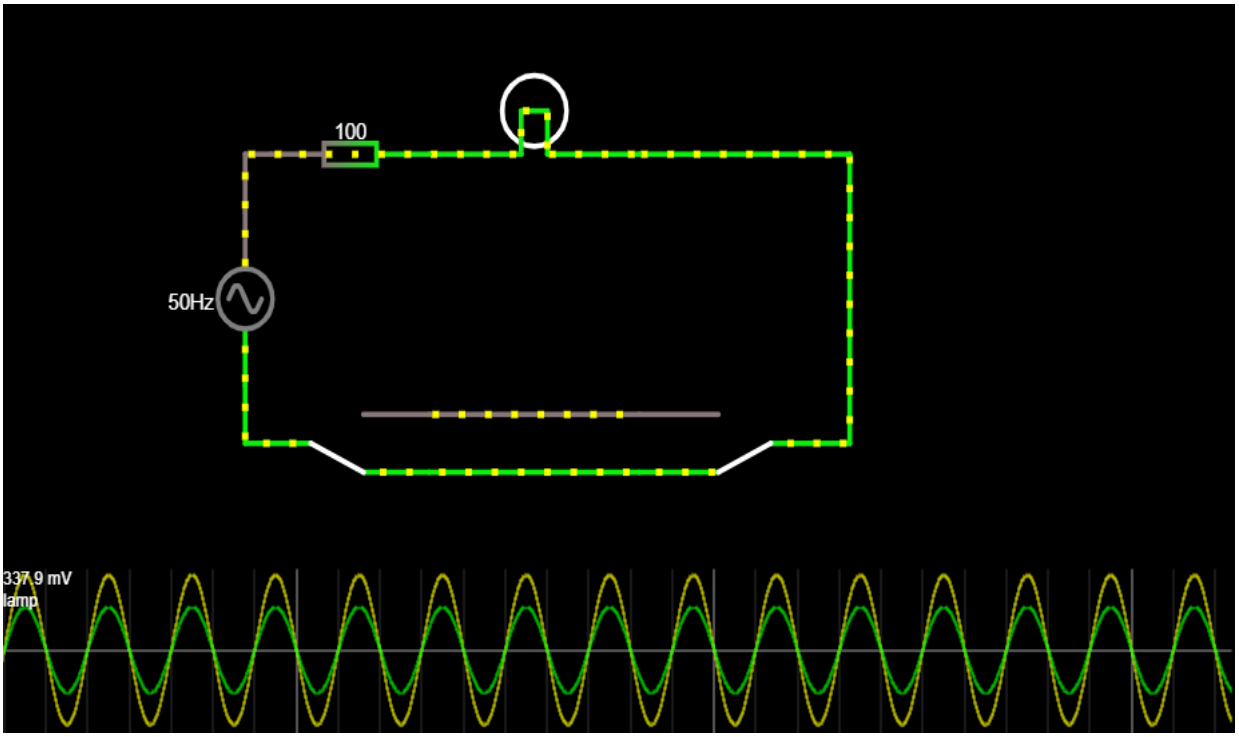
SWITCH S1 IN 1 AND S2 IN 1’ POSITION



SWITCH S1 IN 1 AND S2 IN 1’ POSITION



SWITCH S1 IN 1 AND S2 IN 1' POSITION



SWITCH S1 IN 3 AND S2 IN 3' POSITION

Result: Hence, stair-case wiring is verified from the e circuit diagrams.

POST LAB QUESTIONS

1. **What is the use of staircase wiring?**

Ans: Staircase wiring is a common **multi-way switching or two-way** light switching connection where a load with two switches are used. This is done to operate the load from separate positions such as above or below the staircase.

2. **Why choke is used in fluorescent lamp?**

Ans: A choke is a **coil of wire**. The purpose of the choke is to **provide a very high voltage initially (an inductive 'kick') between the filaments** (across the two ends of the tube light). Again, once the gas in the tube is ionized the choke provides a low voltage.

3. **What is the purpose of magnetic ballast in fluorescent lamp?**

Ans: The magnetic ballast uses a **magnetic transformer of copper windings** around a steel core to **convert the input line voltage and current to the voltage and current required to start and operate the fluorescent lamps**. Capacitors are added to assist lamp starting and power factor correction.

4. Compare electronic ballast and magnetic ballast?

Ans:

Electronic Ballast	Magnetic Ballast
1. Electronic ballasts alter the flow of electricity in the light bulb by using a series of induction coils that are separated from one another.	1. In contrast, magnetic ballast uses 1 induction coil and not a series.
2. The size of this ballast is small and light. They are also energy efficient.	2. They are bulkier in size and are less energy efficient.

5. List out the advantage of staircase wiring

Ans: The advantages of staircase wiring are:

- Easy to control appliances from various points.
- Faster control than a single switch.
- Highly Efficient for larger places.
- Living Comfort can be increased.
- Electricity can be saved.

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