WIRING CIRCUIT FOR A SINGLE LAMP AND A FAN WITH REGULATOR

Ex. No. : 6 **Date : 22/11/2021**

Aim

To understand the internal wiring of a switch box to control a lamp, fan and an external gadget connected to a 5-pin socket.

Materials Required

S. No.	Name of the apparatus	Range / Type	Quantity
1	Incandescent Lamp	230 V, 25 W	1 Nos.
2	Lamp holder	230 V, Level	3 Nos.
3	Ceiling fan	230V, 60W	1 No.
4	Switch Box	12” x 4”	4 Nos.
5	Fan regulator	230V	1 No.
6	1 way switch	230 V, 5 A	3 Nos.
7	P. V. C. casing capping	¼”	As required
8	Wooden Board	4’ x 3.5‘	1 No.
9	Ceiling rose	230 V	1 Nos.
10	Wires	1 sq. mm”	As required

Tools Required

Screw driver, Wire stripper, Hacksaw, combination plier, drilling machine, electrician knife

Procedure

1. Collect the materials required for this experiment.
2. Draw the layout of the given circuit diagram on the work board.
3. Fix the switches, regulator, indicator and 5-pin socket by using necessary tools in the switch board front panel.
4. Do the internal connections using wires of required size as per the circuit diagram.
5. Test the circuit and note down the observations.

Precautions

1. Energize the circuit with the presence of Lab instructor / Faculty.
2. No part of a live circuit should be touched by the bare hand.
3. Keep the body, or any part of it, out of the circuit.
4. Keep the work area and workbench clear of items not used in the experiment.
5. When disassembling a circuit, first remove the source of power.

Fuse Rating Calculations

Total Power drawn by the circuit = 60+40+100
watts Voltage of the circuit = 230 volts

P = V I COS Ø

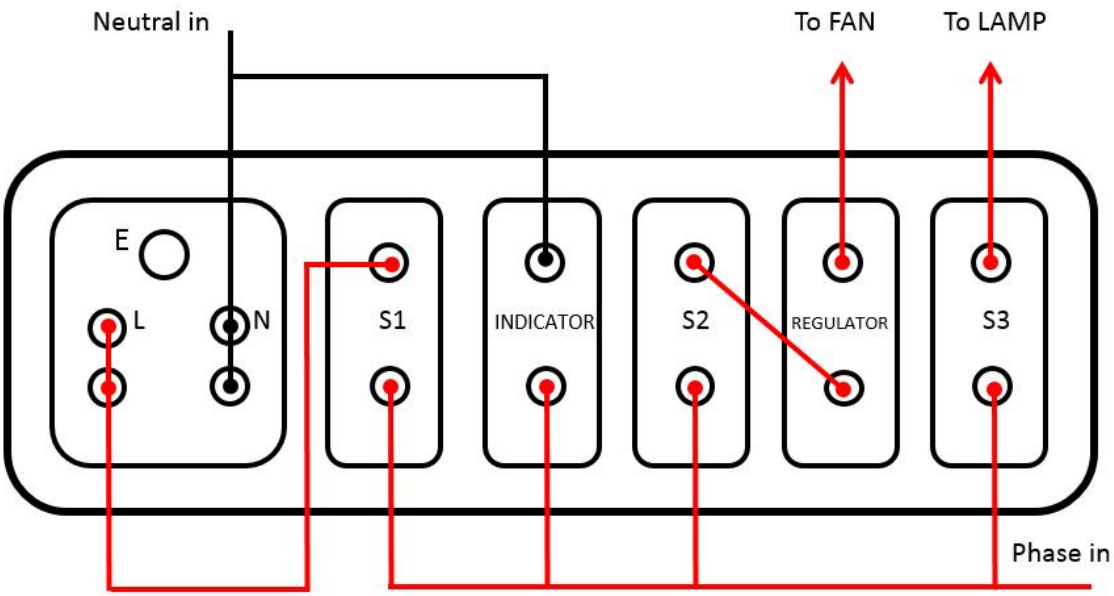
P = V x I x 1 (Assuming COS Ø = 0.8 for resistive load)

Current in the circuit (I) = power (P) / (Voltage (V) x COS Ø)

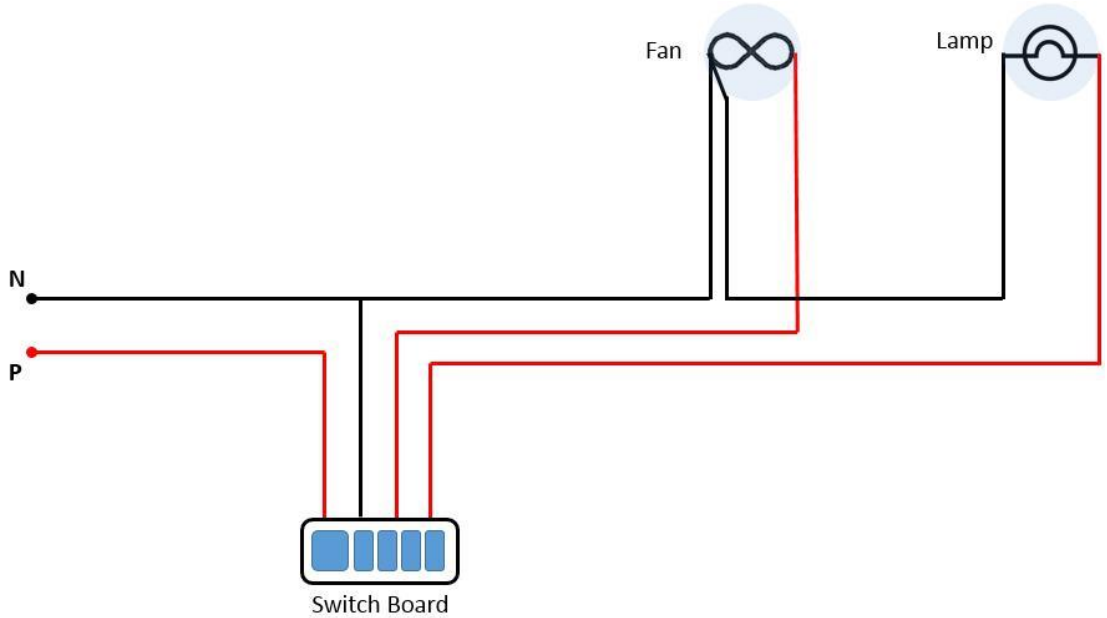
= 200 W / (230 V x 0.8) = 1.0869 A.

Fuse rating of the circuit= rounding off the current to the nearest 5 =
5A (Normally fuses are available in the ratings of 5A, 10A and etc.)

Wiring Diagram – Switch Board (internal)



Circuit Diagram



Observation

Condition No	Expected conditions							Observed conditions						
	S1	S2	S3	Indi cator	Ext. Load	Fan	Lamp	S1	S2	S3	Indi cator	Ext. Load	Fan	La mp
1	ON	OFF	OFF	ON	ON	OFF	OFF	**ON**	**OFF**	**OFF**	**ON**	**ON**	OFF	OFF
2	OFF	ON	OFF	ON	OFF	ON	OFF	**OFF**	**ON**	**OFF**	**ON**	OFF	**ON**	OFF
3	OFF	OFF	ON	ON	OFF	OFF	ON	**OFF**	**OFF**	**ON**	**ON**	OFF	OFF	**ON**
4	ON	ON	OFF	ON	ON	ON	OFF	**ON**	**ON**	**OFF**	**ON**	**ON**	**ON**	OFF
5	OFF	ON	ON	ON	OFF	ON	ON	**OFF**	**ON**	**ON**	**ON**	OFF	**ON**	**ON**
6	ON	OFF	ON	ON	ON	OFF	ON	**ON**	**OFF**	**ON**	**ON**	**ON**	OFF	ON
7	ON	ON	ON	ON	ON	ON	ON	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**

Result

The circuit created is used to turn on respective loads. In this case - a fan, a light and an external load. The specific load can only be powered when it's switch is turned on, leaving all the others off when they're switch is off. This is the predominant form of wiring everywhere.