



UNIVERSITY OF ENGINEERING AND
TECHNOLOGY LAHORE

Electrical Workshop

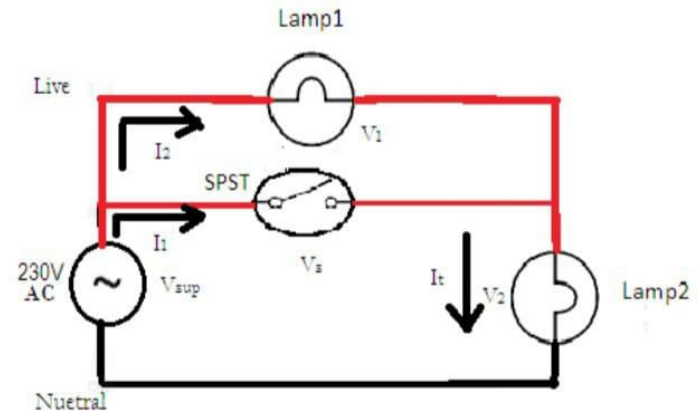
Course Number ME-100L

Project Report

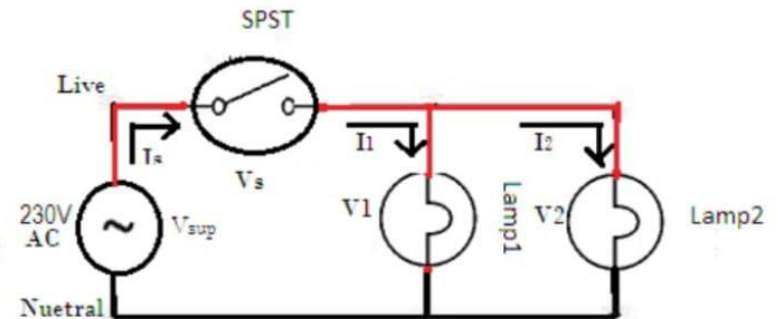
- **Project Title :-**
Extension Lead
- **Department :-**
Civil Engineering
- **Submitted To :-**
Professor Hafiz Furqan Sabir
- **Submitted By :-**
Saqlain Tariq
2020-CIV-195

Project Task

- We want to prepare an extension lead which implement two circuits :-
 - a) Test board circuit with 1-way switch.
 - b) Parallel sockets with single control circuits that are supposed to control 4 2-pin sockets by means of a switch.



Test Board Circuit with 1-way Switch



Parallel Lamps controlled by single Switch

Apparatus & Tools

- **1-way Switch (SPST)**

It is two terminal device used to control the flow of current in single path such that it can conduct the electric current in its closed state and stop the flow of current in its open state.



- **2-pin Socket**

The device plug is not earthed and its normally has two pins that transmit electricity. In most countries in the world 2-pin sockets have been replaced with earthed sockets mean 3-pin sockets or plugs.



Apparatus & Tools

- **Pendent Type Lamp Holder**

It is used to hold the electric lamp and connect it with the circuit. It is used to held suspended by means of connected wires or cable.



- **Connecting Wires**

It allows an electrical current to travel from one point on a circuit to another because electricity needs a medium through which it can move. Most of the connecting wires are made up of copper or aluminum.



Apparatus & Tools

- **Extension Box**

Extension boxes are available in wooden or plastic material. Wooden box is best for safety due to the flow of any current in the extension.



- **Lamp or Bulb**

Lamp mean any of various devices for producing light or sometimes heat. It is also available in 12 watts power. We also used LED bulbs or 100 watts bulbs in our extension.



Apparatus & Tools

- **Power Wire**

Use high insulation wire for phase supply. Use PVC 2-core 40/0.0076" copper cable. This wire has two inner wires, one is for phase and other one is for normal.



- **2-pin Plug**

Plugs are connected at appliance end. Plug terminals are required to connect with the circuit of appliance.



Apparatus & Tools

- **Phase Tester**

Phase, electric mains or line tester is a basic tool which is used to test and identify Phase in electrical installation also known as voltage or current detector.



- **Wire Cutter**

Diagonal pliers are pliers intended for the cutting of wire. The plane defined by the cutting edges of the jaws intersects the joint rivet.



Procedure

The steps of procedure are describe step by step in following

- First I took the sockets, buttons and holder and opened its screw. And then plug them all in the extension box.
- I made the internal connection of the extension by using simple wire (normally available in red and black color).
- Then I connected the main power (phase) wire at the two points on the extension.
- I attached a regular 2-Pin plug at the other end of the power (phase) wire.
- Then I supply the electric voltage to the extension for concluding my lead extension.

Detail of Project

Advantages

- This extension is also use for as a normal extension lead and also for as a test board.
- Easy to carry (lift) and also in light weight.
- Use as a table lamp for study purpose and also for some work in any field area at night.

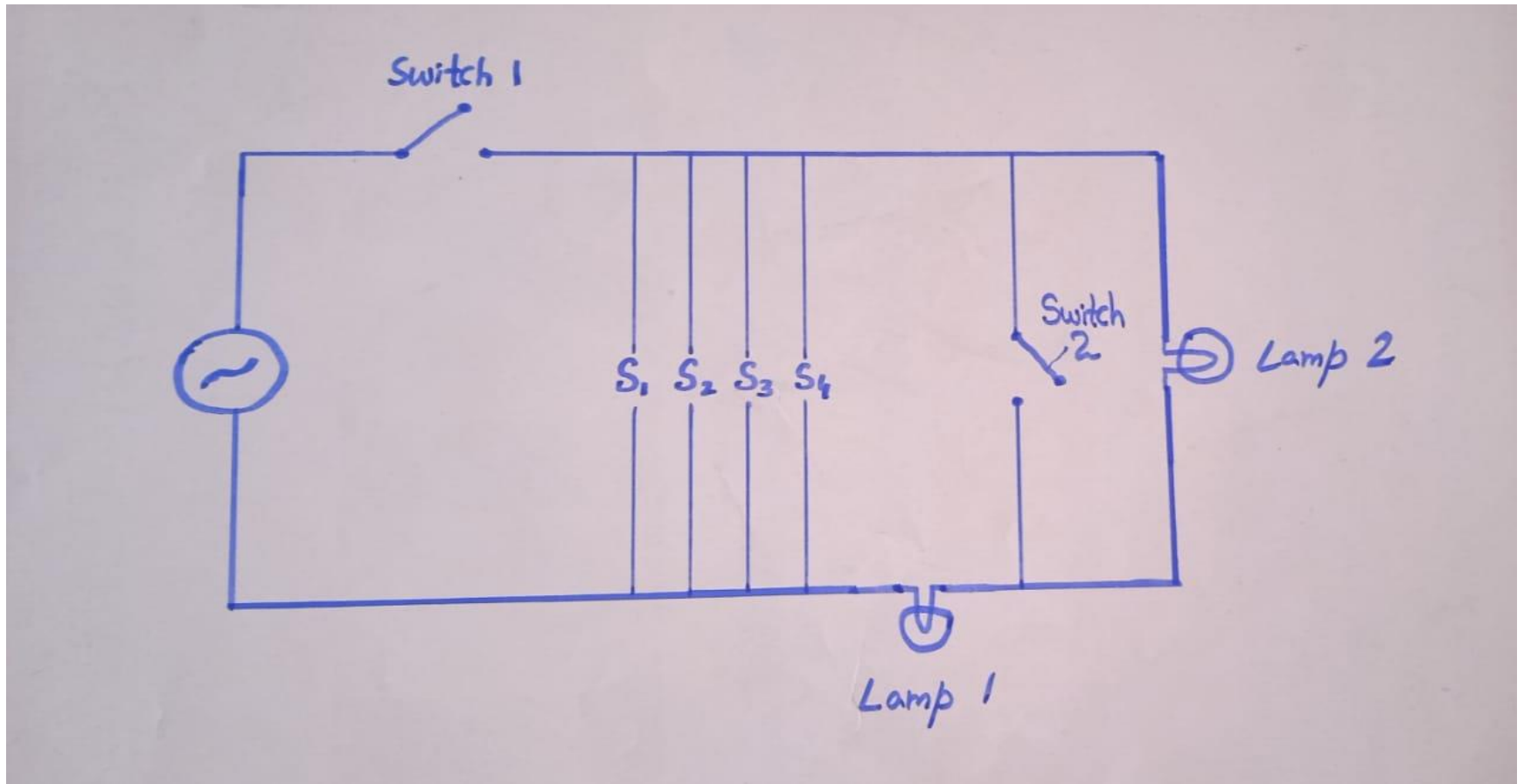
Disadvantages

- Due to some voltage issue, this extension lead will be a source of fire and damage itself and other wiring too.
- Extension cords can overheat and cause fires when used improperly.
- Not work functionally, if some change is done in its internal connecting wires.

Future Modifications

The future modifications of this project is that we can use it in some more technical ways by inputting some more functions in it. We can even add volt meter, am-meter or ohm meter in it to display values of voltage, electric current and resistance in wiring, respectively. Moreover we can add Fuse Button also for its safety. We can add multiple pin plug to use it for every electric device. We attach some battery too, to store electricity in the extension lead for use it in some electricity off emergency cases. Add small fan also in this extension. Therefore, we can say that the future modifications of this extension lead is possible in many methods.

Circuit Diagram



Where S_1 , S_2 , S_3 and S_4 are the 2-pin Sockets.

Internal Connections



Pictorial Figure of Project



Working Detail of Extension Lead

- If Switch 1 and Switch 2 are OFF, then current (voltage) doesn't pass through the extension.
- If Switch 1 is OFF but Switch 2 is ON, then current (voltage) doesn't pass through the extension.
- If Switch 1 is ON but Switch 2 is OFF, then 230V passes through the four Sockets separately (due to parallel connections) and Lamp 1 and Lamp 2 become glow with less brightness (due to series connection here).
- If Switch 1 and Switch 2 are ON, then 230V passes through the four Sockets and Lamp 1 separately, and Lamp 2 become short.