

BRAC UNIVERSITY
CSE250: Circuits and Electronics
Laboratory
EXPERIMENT NO.: 2

Name of the Experiment: Introduction to series and parallel circuits .

OBJECTIVE: The experiment is to acquaint the students with series-parallel circuits and to give them the idea about how to connect different circuits in bread board.

THEOREM:

An electrical circuit is a continuous path or array of paths through which an electrical current can flow. The two different ways in which components of a circuit can be connected are called "series" and "parallel". In a series connection, components are connected one after another; therefore, the same current flows through all of them. In a parallel connection, the circuit components are connected side by side. That is, the positive and negative sides of each component are respectively connected together; therefore, each has the same potential drop across. In this lab, we will explore measurements of current and potential difference in simple circuits. Also, we will attempt to verify the textbook expressions for the equivalent resistance of components connected in series and in parallel, and for the power dissipation in a resistive load. For instance, for a circuit consisting of any three resistance values R_1 , R_2 , R_3 , the equivalent resistance in series R_S and in parallel R_P are,

$$R_S = R_1 + R_2 + R_3 + \dots + R_N \quad (1)$$

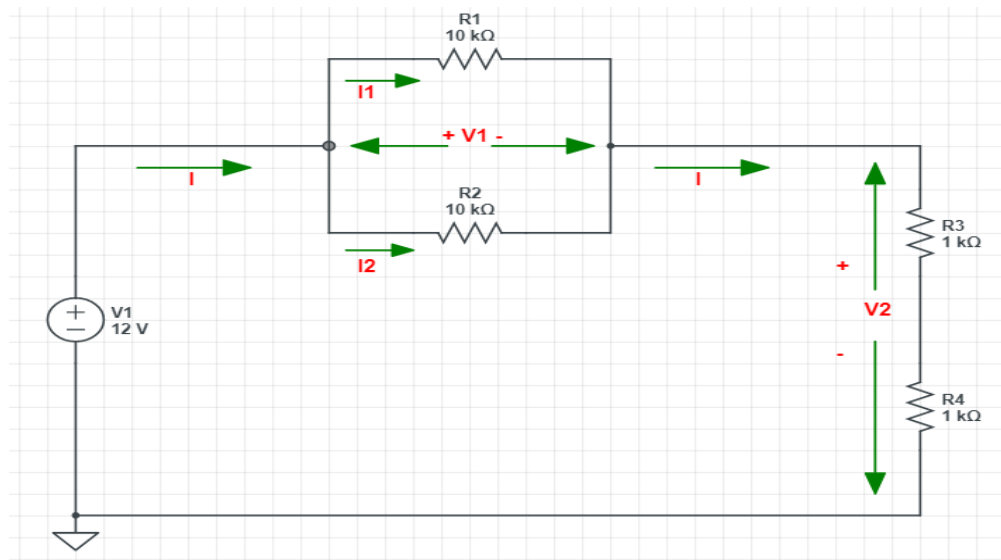
$$1/R_P = 1/R_1 + 1/R_2 + 1/R_3 + \dots + 1/R_N \quad (2)$$

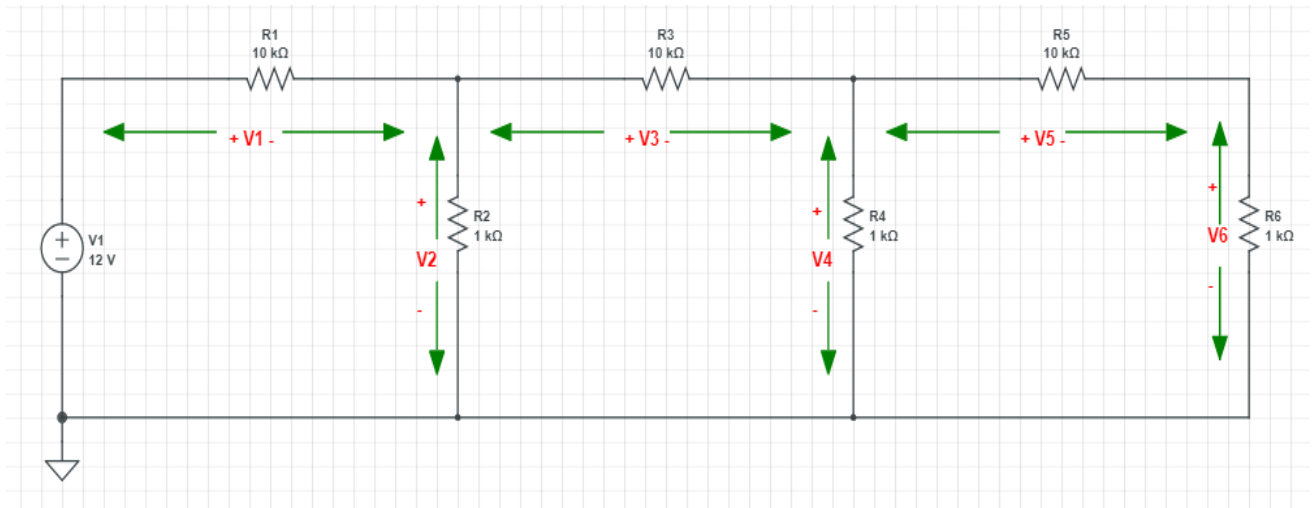
APPARATUS :

- DC power supplies
- Resistors
- Bread board/ Trainer board
- Multimeter

PROCEDURES:

- 1) Set up the circuit as in the following Figures:





- 2) Place and connect the as shown in the circuit diagram.
- 3) Measure the voltage across the resistors (indicated in the circuits) and calculate the current and record it.

REPORT:

1. Show results in tabular form.
2. Comment on the obtained results and discrepancies (if any).

CAUTIONS:

1. Don't switch on the supply until the circuit has been checked by your teacher.
2. Take care of the reading of the apparatus.
3. Take care of any bare circuit element in energized condition.

QUESTION:

- 1) Using the recorded value of the resistors, calculate the value of the currents and check if there is any discrepancies.
- 2) You are given six 100 ohm resistors. Arrange these resistors as to provide an effective resistance value of 300ohm.
- 3) You are given two 1.5kohm resistors and six 15kohm resistors. Arrange these resistors as to provide an effective resistance value of 3.25kohm.

REFERENCES:

1. Introduction to Electric Circuits. By R.C. Dorf & J.A. Svoboda.
2. A Text book of Electrical Technology, Vol. 1 By B.L Theraja & A.K. Theraja
3. Basic Engineering Circuit Analysis By J. D. Irwin