**OPEN ENDED LAB AND DESIGN PROBLEMS.**

# LAB # 08



**Spring 2023 CSE103L Circuits & Systems-I Lab**

# Submitted by: MUHAMMAD JASIM

Registration No: **22PWCSE2102**

Class Section: **C**

“On my honor, as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work.”

Student Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Submitted to:

# Dr.MUNIBA ASHFAQ

(May 21, 2023)

Department of Computer Systems Engineering

University of Engineering and Technology, Peshawar

**LAB TITLE: OPEN ENDED LAB AND DESIGN PROBLEM**

**OBJECTIVE OF LAB:**

In the following lab, we will do an open end discussion and practice on how much knowledge we about voltage divider method , nodal analysis and how to apply KCL and KVL to the nodes and loops of a circuit.

**VOLTAGE DIVIDER METHOD:**

Voltage divider circuits are used to produce different levels from the voltage source but the current is the same for all components in a circuit.

**EQAUTION:**

# Vout

**NODAL ANALYSIS:**

It is a method of determining the voltage between nodes in an electrical circuit in items of the branch currents. Nodal voltage analysis finds the unknown voltage drops around a circuit between different nodes that provide a common connection for two or more circuit components.

**KIRCHOFFS CIRCUIT LAW:**

Kirchoff circuit law allow us to solve complex circuit problems by defining a set of basic network laws and theorems for the voltage and currents and a circuit.

**KIRCHHOFFS CURENT LAW:**

This law states that the amount of current entering a junction is exactly equal to the amount of current leaving the junction.

**MATHEMATICAL FORM:** **I (exiting) + I (entering) = 0.**

**KIRCHHOFF VOLTAGE LAW:**

**This law states that the sum of voltage rise and voltage drop in loop is equal to zero.**

**MATHEMATICAL FORM: ΣV = 0**

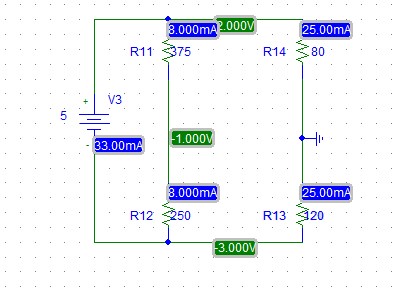
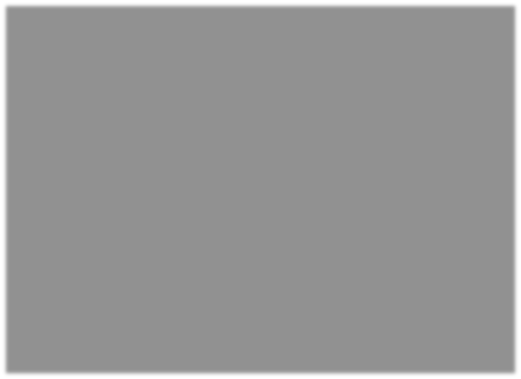
**Q) Design a series-parallel circuit to get the two volt at the end of the output resistor providing a source of 5 volt. Also verify KCL & KVL.**

**1.3**

**CIRCUIT**

**:**

**-**



* **GIVEN:-**

We have assumed the resistance values.

R2=250, R4=120

Voltage supplied is 5 Volt.

We have assumed that voltage across R1 is 3V & R2 is 2V.

* **REQUIRED:**

**By these values, we will find R1 & R3.We will also find total current across the circuit and current across each node.**

* **SOLUTION:-**

To find R1 & R3:**-**

**Apply voltage divider formula:-**

2= (250/250+R1)5

R1=375Ω

3= (120/120+R3)5

R3=80Ω

* **To find total current:**

Total resistance: 1/Rc= 1/ (250+375) +1/ (120+80)

Rc= 151.5Ω

I= V/R

I= 5/151.5 => 0.033A To find I1 & I2:

I1= V/R

=5/(375+250) =>0.008

I2= V/R

=5/(120+80) =>0.025  **To verify KCL:**

Apply KCL at node A

I total= I1+I2

0.033A=0.008A+0.025A => 0.033A=0.033A  **To verify KVL:**

Apply KVL at loop 1

VR1+VR2+Vtotal=0

3A+2A-5A=0 => 0=0

**CONCLUSION:**

In this lab , the value of current calculated theoretically and the value of current by the stimulation of pspice , hence both are same .

# LAB RUBRICS: (Circuits & Systems-I Lab)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria & Point Assigned** | **Outstanding 4** | **Acceptable 3** | **Considerable 2** | **Below Expectations 1** |
| **Attendance and**  **Attentiveness in**  **Lab**    PLO10 | Attended in proper Time and attentive in Lab | Attended in proper Time but not attentive in Lab | Attended late but attentive in  Lab | Attended late not attentive in Lab |
| **Equipment /**  **Instruments**  **Selection and**  **Operation**    PLO1,  PLO2,  PLO3,  PLO5, | Right selection and operation of appropriate equipment and instruments to perform experiment. | Right selection of appropriate equipment and instruments to perform experiment but with minor issues in operation | Needs guidance for right selection of appropriate equipment and instruments to perform experiment and  to overcome errors in operation | Cannot appropriately select and operate equipment and instruments to perform experiment. |
| **Result or Output/ Completion of**  **target in Lab**  PLO9, | 100% target has been completed  and well  Formatted. | 75% target has been  Completed and well formatted. | 50% target has Been completed but not well formatted. | None of the outputs are correct |
| **Overall,**  **Knowledge**  PLO10, | Demonstrates excellent knowledge of lab | Demonstrates good  knowledge of lab | Has partial idea about the Lab and procedure followed | Has poor idea about the Lab and procedure followed |
| **Attention to Lab**  **Report**  PLO4, | Submission of Lab  Report in Proper Time i.e. in next day of lab., with proper  Documentation. | Submission of Lab Report in proper time but not with proper  Documentation. | Late Submission with proper  Documentation. | Late Submission Very poor documentation |