|  |  |  |  |
| --- | --- | --- | --- |
| **Course Name:** | **Elements of Electrical and Electronics Engineering**  | **Semester:** | **I/II** |
| **Date of Performance:** | **16/11/21** | **Batch No:** | **A2** |
| **Faculty Name:** | **Maruti Zalte** | **Roll No:** | **16010121045** |
| **Faculty Sign & Date:** |  | **Grade/Marks:** |  **/ 25** |

**Experiment No: 4**

**Title:** **Maximum Power Transfer Theorem**

|  |
| --- |
| **Aim and Objective of the Experiment:** |
| * To observe maximum power transfer in D.C. circuit.
 |

|  |
| --- |
| **COs to be achieved:** |
| **CO1:** Analyze resistive networks excited by DC sources using various network theorems. |

|  |
| --- |
| **Circuit Diagram/ Block Diagram:** |
|  **Circuit Diagram**Pargat Singh |

|  |
| --- |
| **Stepwise-Procedure:** |
| 1.Set D.C. supply voltage V= 15 V.2. Vary $R\_{L}$ in the range 50 Ω - 10 KΩ in steps of 100 Ω.3. Note down $I\_{L  } and V\_{L}$ for each value of $R\_{L}.$ Where $I\_{L  }and V\_{L}$ are current through $R\_{L} $and voltage across $R\_{L}$ respectively.4. Prepare observation table showing readings of $R\_{L} Vs power P$ : $= I\_{L  }$ . $V\_{L}$5. Plot graph of $P Vs R\_{L}$6. Locate the point of maximum value of power $P $and note down corresponding value of $R\_{L}.$ . Verify the results theoretically |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Observation Table:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Value of RL (kΩ)** | **Load current IL (mA)** | **Power PL=( IL)2RL****(mWatts)** |
| **1** | **0.5** | **2.73** | **3.72645** |
| **2** | **1** | **2.5** | **6.25** |
| **3** | **1.5** | **2.31** | **8.00415** |
| **4** | **2** | **2.14** | **9.1592** |
| **5** | **2.5** | **2.00** | **10** |
| **6** | **3** | **1.87** | **10.4907** |
| **7** | **3.5** | **1.76** | **10.8416** |
| **8** | **4** | **1.67** | **11.1556** |
| **9** | **4.5** | **1.58** | **11.2338** |
| **10** | **5** | **1.50** | **11.25** |
| **11** | **5.5** | **1.43** | **11.24695** |
| **12** | **6** | **1.36** | **11.0976** |
| **13** | **7** | **1.25** | **10.9375** |
| **14** | **8** | **1.15** | **10.58** |
| **15** | **9** | **1.07** | **10.3041** |
| **16** | **10** | **1.00** | **10** |

 |
| **Screenshot of Output:****Power PL (mW)****Load current IL (mA)** |

|  |
| --- |
| **Conclusion:** |
| This theorem states that the maximum power that can be transferred from source to load is 50%, which occurs when source impedance is exactly matched to load impedance. |

|  |
| --- |
| **Signature of faculty in-charge with Date:** |