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| **Course Name:** | **Elements of Electrical and Electronics Engineering** | **Semester:** | **I** |
| **Date of Performance:** | **30 /09/ 2023** | **Batch No:** | **C4-1** |
| **Faculty Name:** |  | **Roll No:** | **11** |
| **Faculty Sign & Date:** |  | **Grade/Marks:** | **/ 25** |

**Experiment No: 4**

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

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| **Aim and Objective of the Experiment:** |
| * To observe maximum power transfer across load resistor in a D.C circuit. |

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

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| **Circuit Diagram:** |
| **VS = 15 V and RS = \_560\_ Ω** |

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

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| **Observation Table:** |
| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Sr. No. | RL Ω | Circuit Current (IL) in mA | | Voltage (VL) in Volts | Power absorbed by load (PL) in W  PL = IL2.RL | | | Theoretical | Practical | Theoretical | Practical | |  | 114 | 22.25 | 22.08 | 2.537 | 56437.125 | 55578.0096 | |  | 214 | 19.37 | 19.71 | 4.147 | 80292.1366 | 83135.5974 | |  | 325 | 16.94 | 17.14 | 5.508 | 93263.17 | 95478.37 | |  | 402 | 15.59 | 15.75 | 2.268 | 97705.3362 | 99721.125 | |  | 504 | 14.09 | 14.2 | 7.105 | 100058.1624 | 101626.56 | |  | 545 | 13.57 | 13.24 | 7.398 | 100358.9705 | 95537.2 | |  | 606 | 12.86 | 12.96 | 7.796 | 100220.0376 | 101784.73 | |  | 716 | 11.76 | 11.86 | 8.417 | 99021.0816 | 100712.27 | |  | 807 | 10.97 | 11.06 | 8.855 | 96994.7654 | 98715.15 | |  | 901 | 10.27 | 10.26 | 9.251 | 95031.0829 | 94846.11 | |  | 1006 | 9.57 | 9.59 | 9.636 | 92134.4094 | 92519.19 | |

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| **Graph: Draw a graph showing effect of variation in** RL on PL using observation table. Take RL on X –axis and PL on Y- axis. (Use a graph paper)    **In this graph orange line denotes the Practical Power and the blue line denotes the Theoretical value.** |
| **Conclusion-**   1. **Explore one practical application where Maximum Power Transfer Theorem is used.**   radio communication   1. **Draw a block diagram or circuit diagram of this application.**      1. **Explain in brief.**   To transmit energy from your transmitter into the antenna efficiently. “Maximum power transfer takes place when the load impedance is equal to the complex conjugate of the source impedance.”  **OR**  **Answer the following:**   1. **Do you apply Thevenin’s Theorem to calculate Maximum Power across load resistor in a D.C. circuit?** 2. **Take a sample problem. Draw a block diagram or circuit diagram of this sample problem.** 3. **Explain the solution in brief.** |

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