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| **Course Name:** | **Elements of Electrical and Electronics Engineering** | **Semester:** | **I** |
| **Date of Performance:** | **22/09/23** | **Batch No:** | **C4-1** |
| **Faculty Name:** |  | **Roll No:** | **11** |
| **Faculty Sign & Date:** |  | **Grade/Marks:** | **/ 25** |

**Experiment No: 3**

**Title:** **Thevenin’s Theorem & Norton’s Theorem**

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| **Aim and Objective of the Experiment:** |
| * To Verify for Thevenin’s Theorem for the circuit * To Verify Norton Theorem for the 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:** |
| **Task 1: Circuit Diagram to measure RTH/RN:**    **Task 2: Circuit Diagram to measure VTH:**    **Task 3: Circuit Diagram to measure IN:** |

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| **Stepwise-Procedure:** |
| **Thevenin’s Theorem:**  1. Connect the circuit as shown in the circuit diagram.  2. Set 10V and measure open circuit voltage VTh across load terminals A and B.  3. Replace all voltage sources by Short circuit and measure RTh across terminals A and B as per the circuit diagram shown in the figure.  4. Draw Thevenin’s equivalent circuit and determine the value of load current from it.  5. Verify the results theoretically.  **Norton’s Theorem:**  1. Connect the circuit as shown in the circuit diagram.  2. Set the voltages 10V  3. Remove the load resistance and measure the short circuit current ISC through A and B terminals.  4. Replace all the voltage sources by short circuit and measure RTh across terminals A and B as per the circuit diagram shown in the figure.  5. Draw Norton’s equivalent circuit and determine the value of load current.  6. Verify the results theoretically |
| **Calculations:**  **Verified Thevenin’s Theorem & Norton’s Theorem** |

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| **Observation Table:** |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | **VTH (V)** | **RTH / RN**  **(Ω)** | **IN  (mA)** | **IL (mA)** | | **Theoretical value** | **-4.103** | **266.49Ω** | **17.69** | **-11.2** | | **Practical value** | **-4.08** | **263Ω** | **17.6** | **-11.2** | |
| **Draw Thevenin’s Equivalent circuit-:**    **Draw Norton’s Equivalent circuit -:** |

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| **Conclusion:** |
| The Thevenin and Norton theorems help to reduce the complexity of circuits, making them easier to analyze and solve. Hence, they are widely used in circuit design and analysis and are valuable tools for electrical engineers and technicians. |

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