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| **Course Name:** | **Elements of Electrical and Electronics Engineering Laboratory** | **Semester:** | **I** |
| **Date of Performance:** | **13/09/2024** | **Batch No:** | **C4-1** |
| **Student Name:** | **Dhruv Pankhania** | **Roll No:** | **16010124216** |
| **Faculty Sign & Date:** |  | **Grade/Marks:** | **/ 20** |

**Experiment No: 2**

**Title:** **Mobile Battery Charger**

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| **Aim and Objective of the Experiment:** |
| * To understand the working of Mobile Battery Charging Circuit * To implement the circuit of Mobile Battery charger on Breadboard and observe the waveforms at various points (Input and output Waveforms for Bridge Rectifier) and measure the output voltage |

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| **COs to be achieved:** |
| **CO1:** Analyze resistive networks excited by DC sources using various network theorems.  **CO2:** Demonstrate and analyze steady state response of single phase and three phase circuits  **CO3:** Understand principles and working of AC and DC machines with their applications.  **CO4:** Explain rectifier-filter circuits using PN junction diode and voltage regulator circuits  using Zener diode |

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| **Requirements:** |
| Step-down Transformer (6V-0-6V), Diodes(1N4007), voltage regulator IC 7805, Resistor, Capacitors, CRO, Digital Multimeter (DMM), breadboard, connecting wires, Micro USB cable, etc. |

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| **Circuit Diagram:** |

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| **Stepwise-Procedure:** |
| 1. Design circuit and connect it as shown in the circuit diagram 2. Observe the waveform on the CRO at different points in the circuits. |

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| **Output waveforms observed on CRO:** |
| **1. Plot secondary voltage across transformer versus time**    **2. Plot Rectifier output versus time**    **3. Plot Capacitor filter output versus time**    **4. Plot output of Voltage regulator versus time** |

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| **Observation Table:** |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Vin (p-p & rms )**  **(input of Rectifier in Volts)** | | **Vout(peak)**  **Output of Rectifier (in Volts)** | | | **DC output of 7805 (in Volts)** | | 19.4 | 7 | Resistor | 9.2 | 5.51 | 5.05 | | 20.2 | 7.3 | Capacitor | 7.39 | 7.39 | |
| **Post Lab Subjective:** |
| 1. State commonly used types of mobile phone batteries   Mobile phones commonly use different types of batteries, with Lithium-Ion (Li-Ion) being the most popular due to its high energy density, lightweight design, and long lifespan. Lithium Polymer (Li-Po) batteries, known for their flexibility and slim design, are also widely used. Older phones often relied on Nickel Metal Hydride (NiMH) batteries, which were heavier and less efficient, while Nickel Cadmium (NiCd) batteries are now obsolete due to their low capacity and environmental issues.   1. Explain how to maximize Battery Performance/ Battery life of your mobile phone?   To maximize your mobile phone's battery performance, avoid exposing it to extreme temperatures, as heat and cold can degrade the battery. Lowering screen brightness and using power-saving modes can reduce power consumption. Limiting background apps, turning off unnecessary features like Bluetooth and GPS, and reducing push notifications also help conserve battery life. It’s best to avoid full discharges by charging when the battery drops to around 20-30%, and use the original charger to avoid damage. Regular software updates ensure your phone has the latest optimizations for battery management, further extending its lifespan.  3. Write important specifications of Voltage regulator IC 7805  (You can attach data sheet of IC 7805) |

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| **Conclusion:** |
| We understood the working of Mobile Battery Charging Circuit. We also implemented the circuit of Mobile Battery charger on Breadboard and observed the waveforms at various points (Input and output Waveforms for Bridge Rectifier) and measure the output voltage on a CRO. |

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