

EXP-3: DESIGN OF REGULATED POWER SUPPLY

OBJECTIVE:

The purpose of the experiment is to design a DC regulated power supply and determine the load regulation.

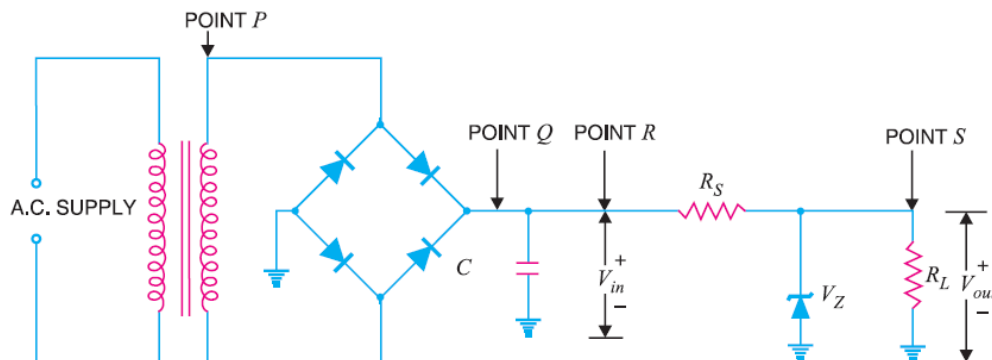
EQUIPMENT AND COMPONENTS:

1. Dual Channel Cathode Ray Oscilloscope
2. Digital Multimeter.
3. 220 V, 50Hz / 12 V, 50 Hz Step down transformer.
4. 1N4007 Diodes & Zener Diode.
5. Variable Resistor.
6. Electrolytic Capacitor 100 μ F/25V.
7. Breadboard and Connecting wires.
8. BNC Cables and Probes

THEORY:

1. Every electronic circuit is designed to operate on DC supply voltage.
2. A regulated power supply provides this constant DC output voltage and continuously holds the output voltage at the design value regardless of changes in load current or input voltage.
3. The power supply contains a rectifier, filter, and regulator.
4. The rectifier changes the AC input voltage to pulsating DC voltage.
5. The filter section removes the ripple component and provides an unregulated DC voltage to the regulator section.
6. The regulator is designed to deliver a constant voltage to the load under varying circuit conditions.
7. The two factors that can cause the voltage across the load to vary are fluctuations in input voltage and changes in load current requirements.
8. Load regulation is a measurement of power supply, showing its capacity to maintain a constant voltage across the load with changes in load current.
9. Line regulation is a measurement of power supply, showing its capacity to maintain a constant output voltage with changes in input voltage.

CIRCUIT:



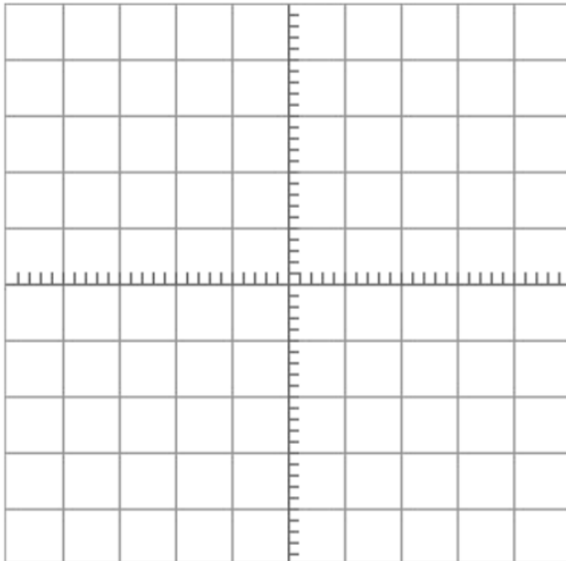
Student Name.....Student ID.....

Exp. 1: DESIGN OF REGULATED POWER SUPPLY

Observations:

Volt/div =

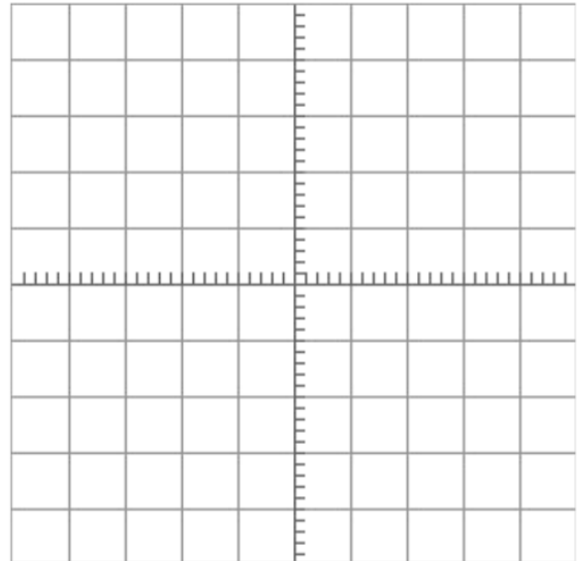
Time/div =



Graph 1: Waveform at the secondary of the transformer

Volt/div =

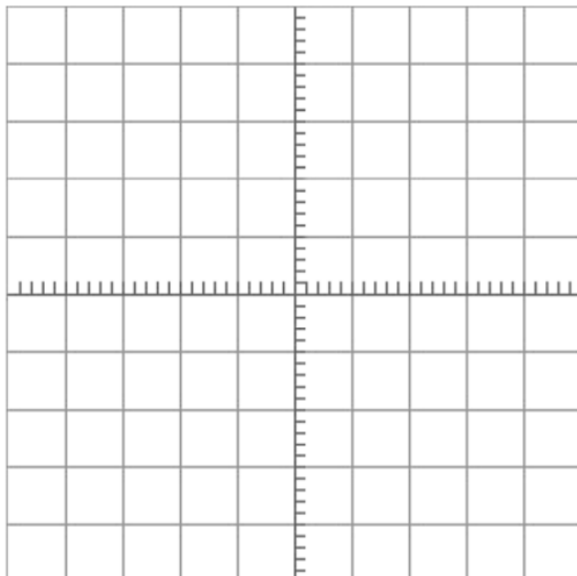
Time/div =



Graph 2: Waveform after rectification

Volt/div =

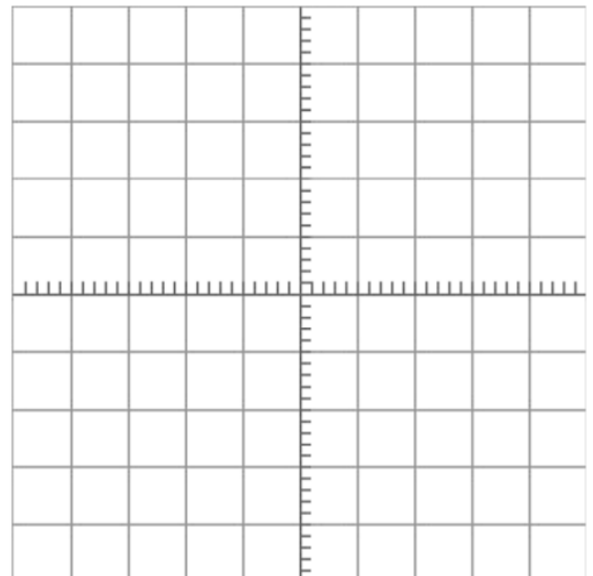
Time/div =



Graph 3: Waveform after filter capacitor

Volt/div =

Time/div =



Graph 4: Regulated DC output

Load Regulation = $((V_{NL} - V_{FL})/V_{FL}) \times 100 \% = \dots\dots\dots\%$