



INDRAPRASTHA INSTITUTE *of*
INFORMATION TECHNOLOGY
DELHI

Department
of
Electronics & Communication Engineering

INTEGRATED ELECTRONICS

Project
Transistor controlled DC

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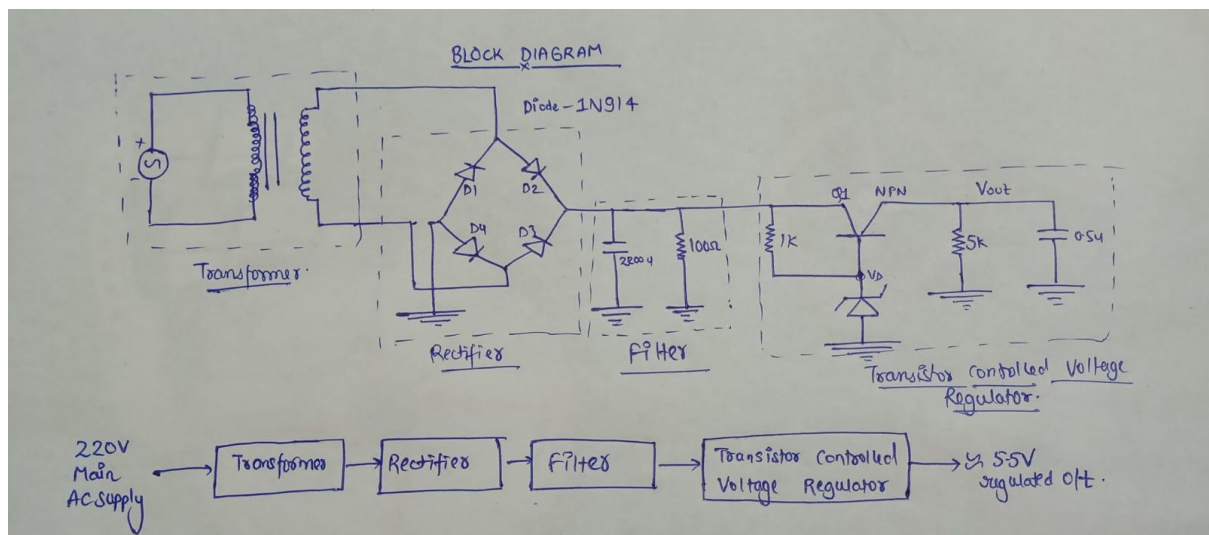
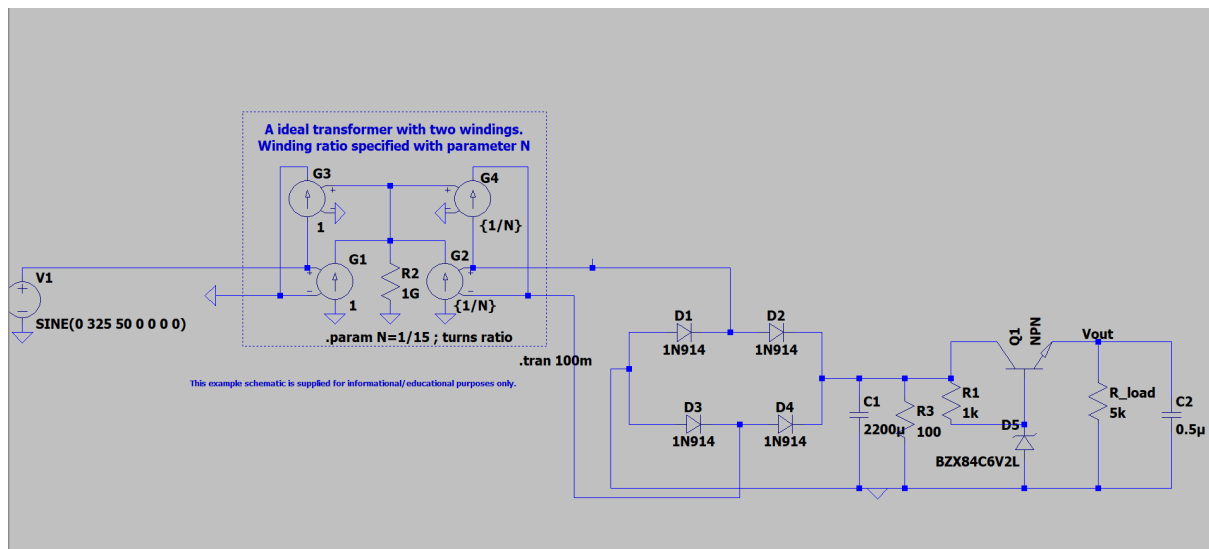
Aim :-Transistor controlled DC regulation

We need Design and construct a transistor controlled voltage regulator based on the characteristics of the Zener diode. The regulator must have protection for its internal component damage for excess current flow through it's output. Determine the output ripple percentage.

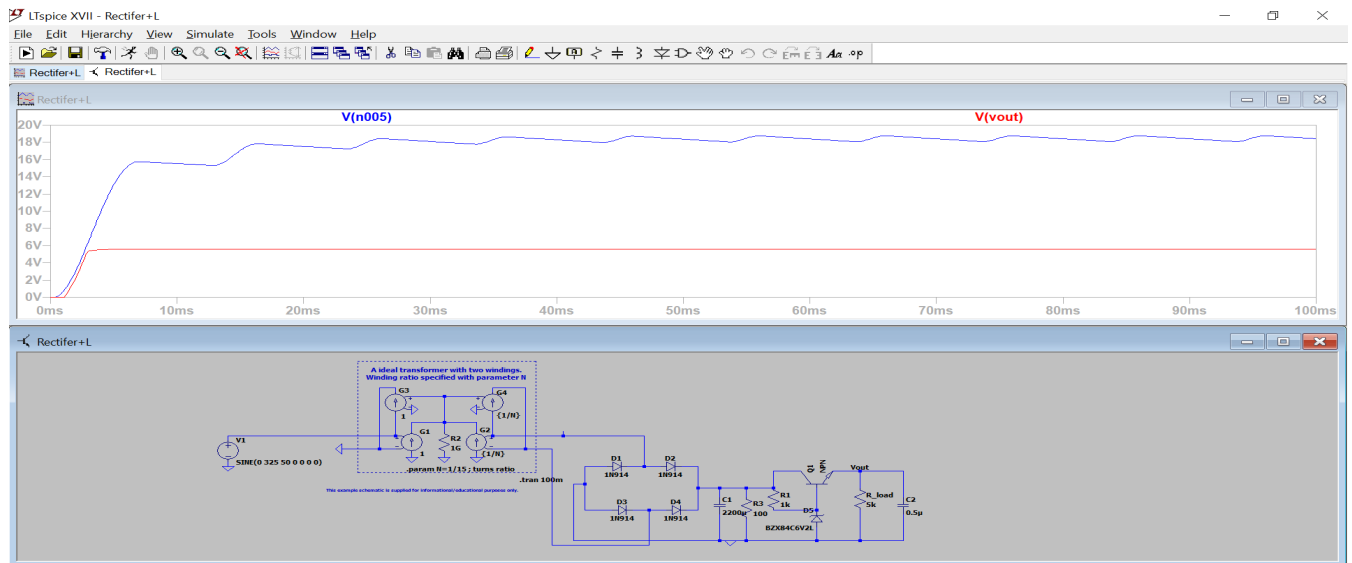
Component:-Transformer, diodes, Transistor,Capacitor, resistance.

Tools: LT-Spice

Block Diagram:



Output



Initially, we have taken the input in the step-down transformer after that step-down transformer will regulate input 220V to 15V. After that, we have added a rectifier that will convert AC to pulsating DC. Then hereafter our pulsating DC output passes through the rectifier circuit which makes it smoother when there will be any kind of fluctuation. For voltage regulators, we have transmission and diodes.

Our output voltage would be

$$V_{out} = V_D - V_{BE}$$

Where V_D = Zener breakdown voltage

V_{BE} = 0.7 Voltage is the barrier potential across base-emitter junctions.

Our output voltage comes out to be.

$$V_{out} = 6.2 - 0.7$$

$$= 5.5 \text{ Volt (Regulated Voltage)}$$

Ripple Factor:- The ripple factor, defined as the ratio of the rms value of the ac component to the dc component.

$$\begin{aligned} 1) \text{ For unregulated voltage} \\ \text{Ripple factor} &= 17.35/17.64 \\ &= 0.984 \end{aligned}$$

$$\begin{aligned} 2) \text{ For regulated voltage} \\ \text{Ripple factor} &= 5.54/5.54 \\ &= 1 \end{aligned}$$

vediolink-<https://youtu.be/HsWe1932BSk>