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EXPERIMENT NO: 12
Design and Troubleshooting of Solar Power Inverter circuit

Aim: To design a solar Power inverter circuit using LTSpice tool.

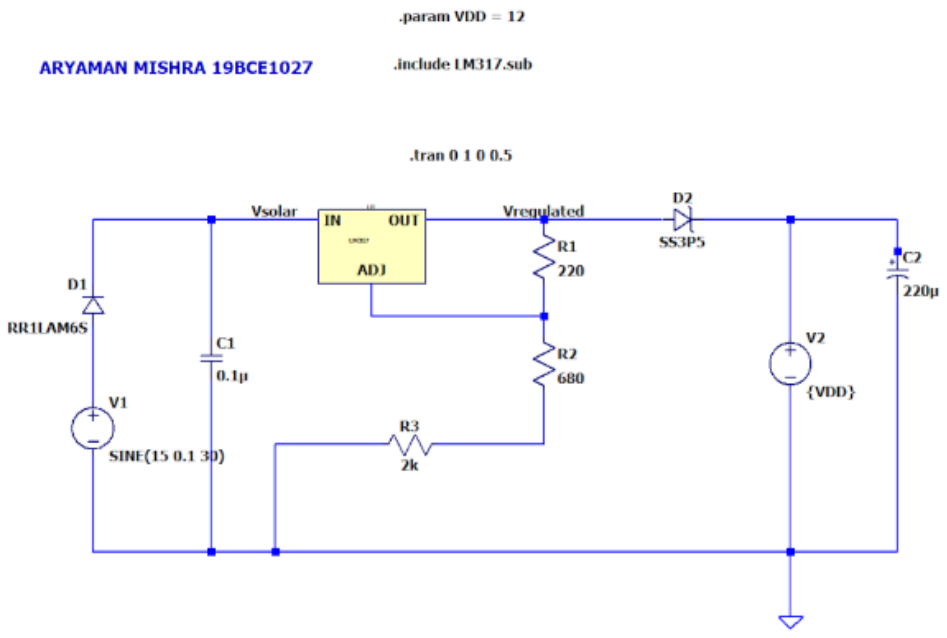
Software used: LTSpice

Components required:

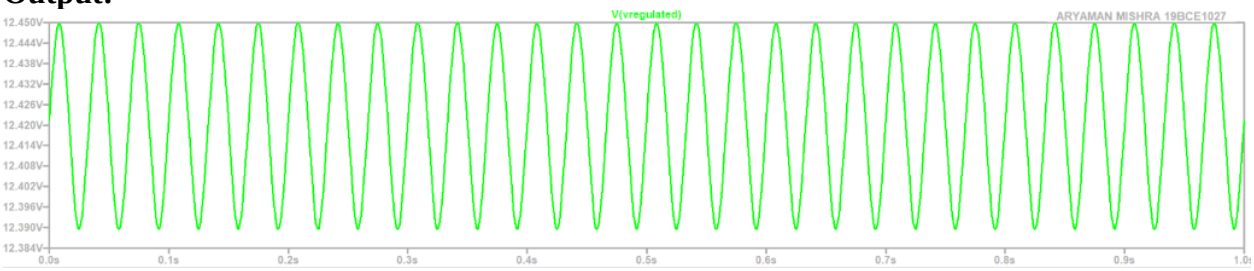
- Solar Panel : 12V 20watts (1600mA)
- LM317: Three terminal Positive voltage regulator (Output voltage from 1.25V to 37V with more than 1.5A current)
- 3A, 50V Shottky diode
- 12/4.5Ah SLA Battery (dc bias to inverter circuit)
- CD4047 PWM generator / ASTABLE multivibrator
- Produces switching waveform
- Inverter circuit using IC CD4047 (Switching Pulse Oscillator): Monostable / Astable multivibrator IC CD4047
- IC: 14 pin Dual in line package
- MOSFET Drivers IRF540N (Power mosfet) Fast switching
- Transformer X1: Reverse with specifications as 230V primary 9V-0-9V /1.5A secondary winding center tapped transformer
- Metal oxide Varistor protects electronic device connected at output.

Task 1: Plot the regulated voltage across Vregulated

Circuit:



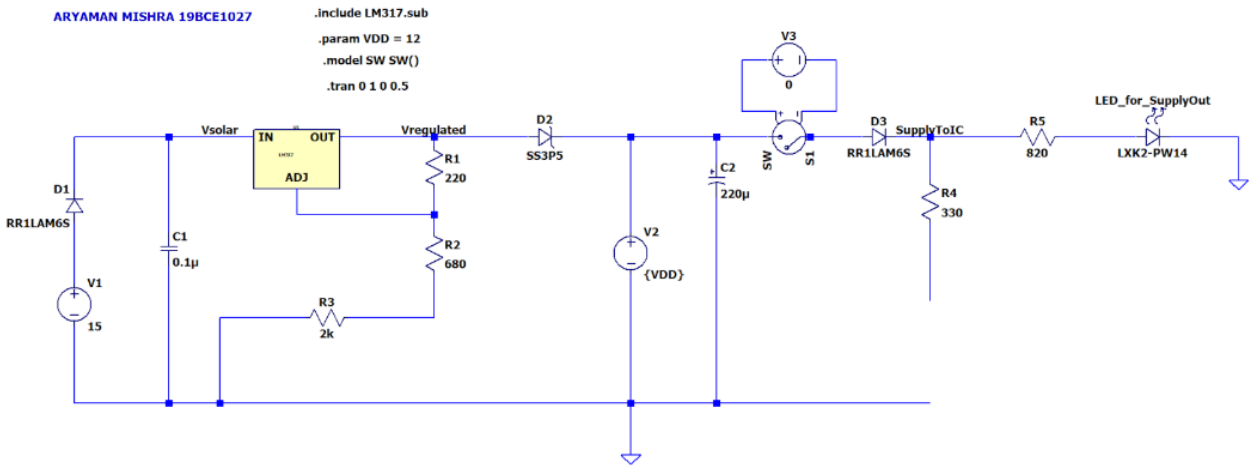
Output:



Result: Thus we have plotted voltage Vregulated.

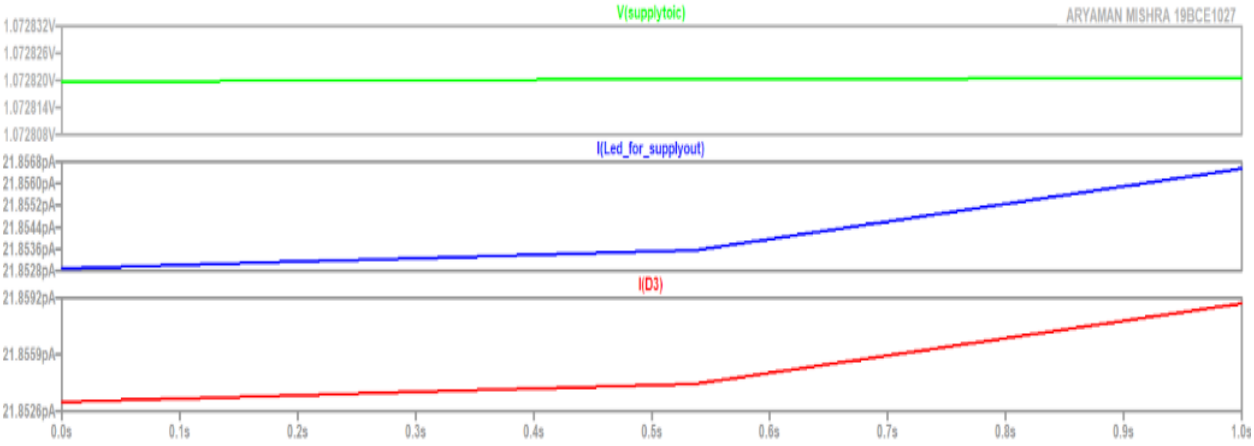
Task 2: IC supply and LED check

Circuit:

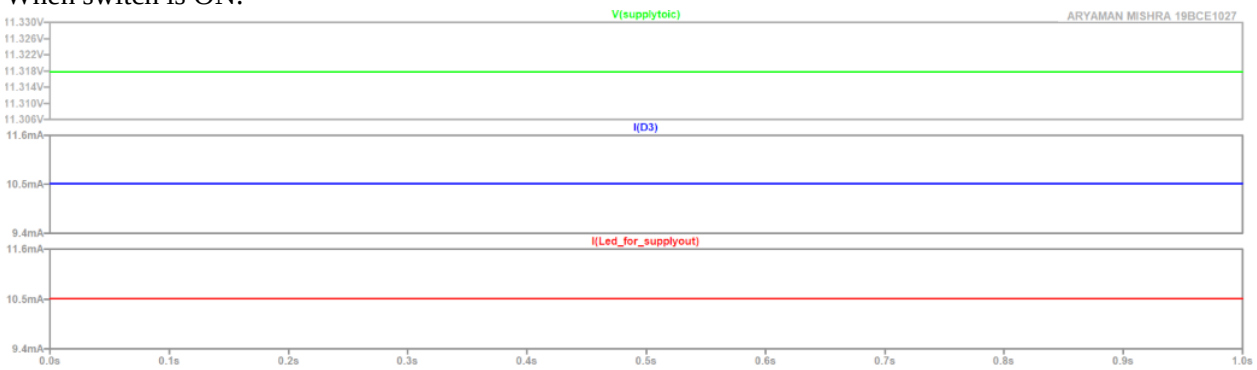


Output:

When switch is OFF:



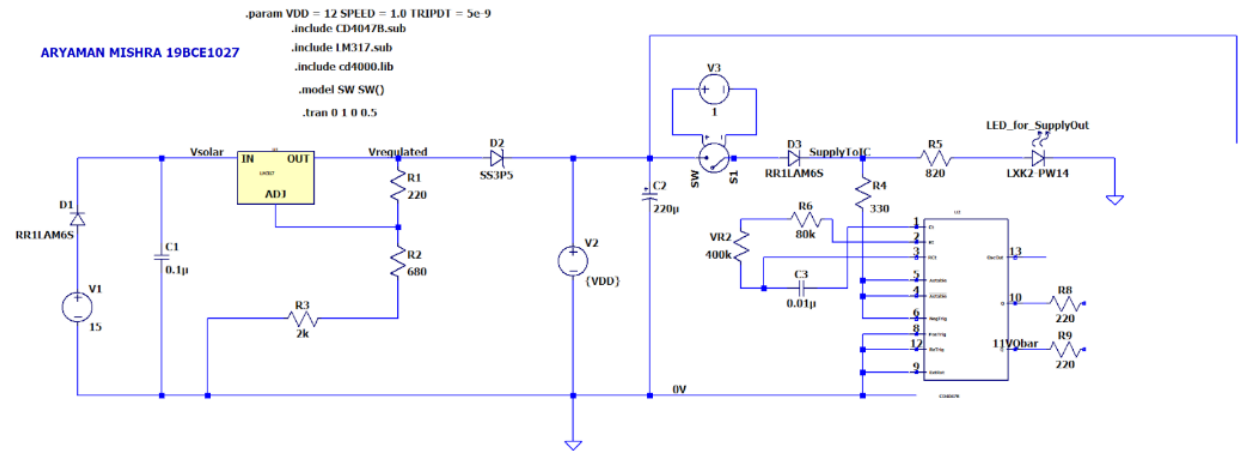
When switch is ON:



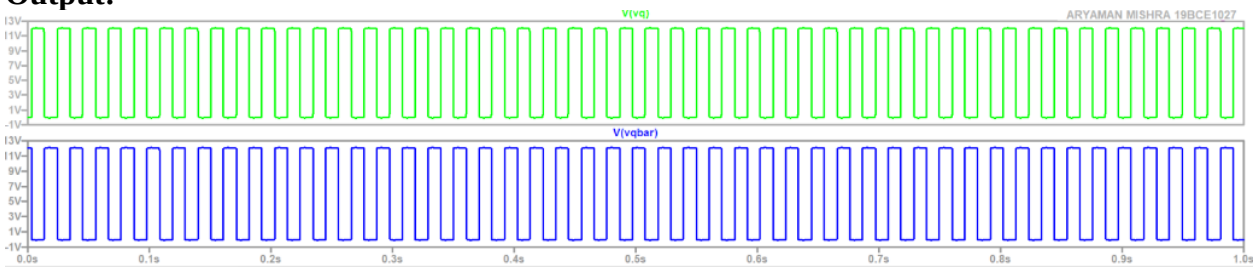
Result: Thus we plotted Vsupply to IC and current through diode when switch is ON and OFF.

Task 3: Plot the waveform at VQ and VQbar.

Circuit:



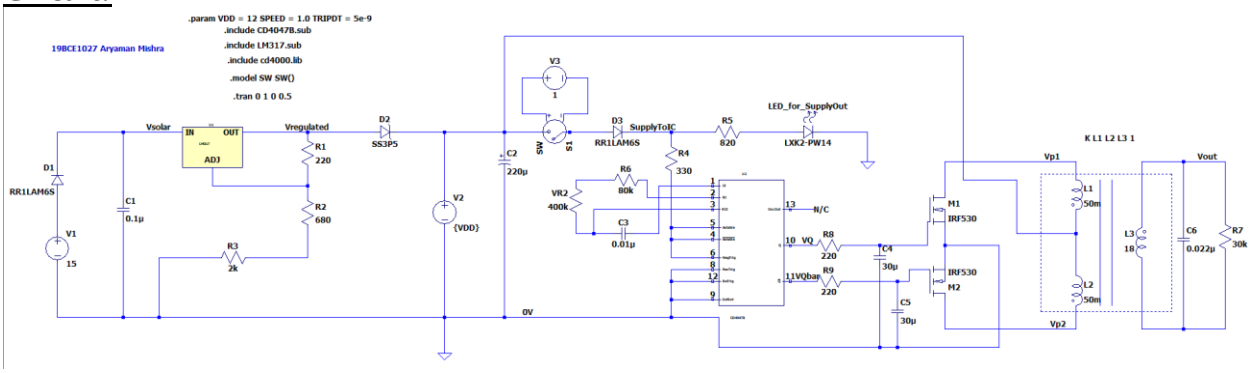
Output:



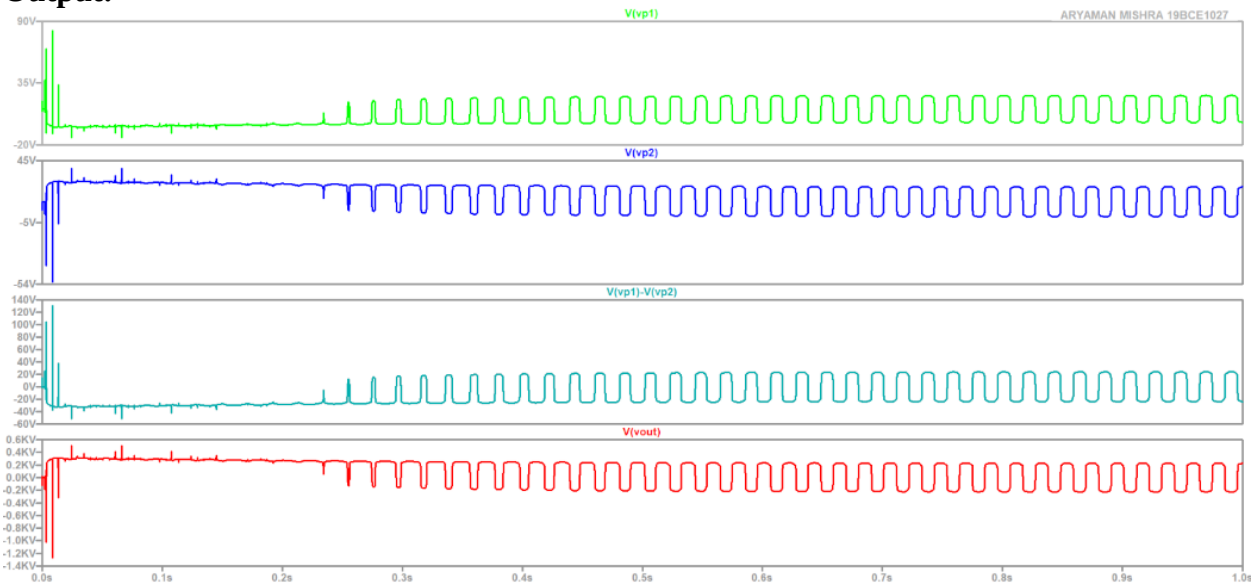
Result: Thus we plotted VQ and VQbar.

Task 4: Plot Vp1, Vp2, Vp1-Vp2, Vout.

Circuit:



Output:



Result: Thus we plotted Vp1, Vp2, Vp1-Vp2 and Vout.