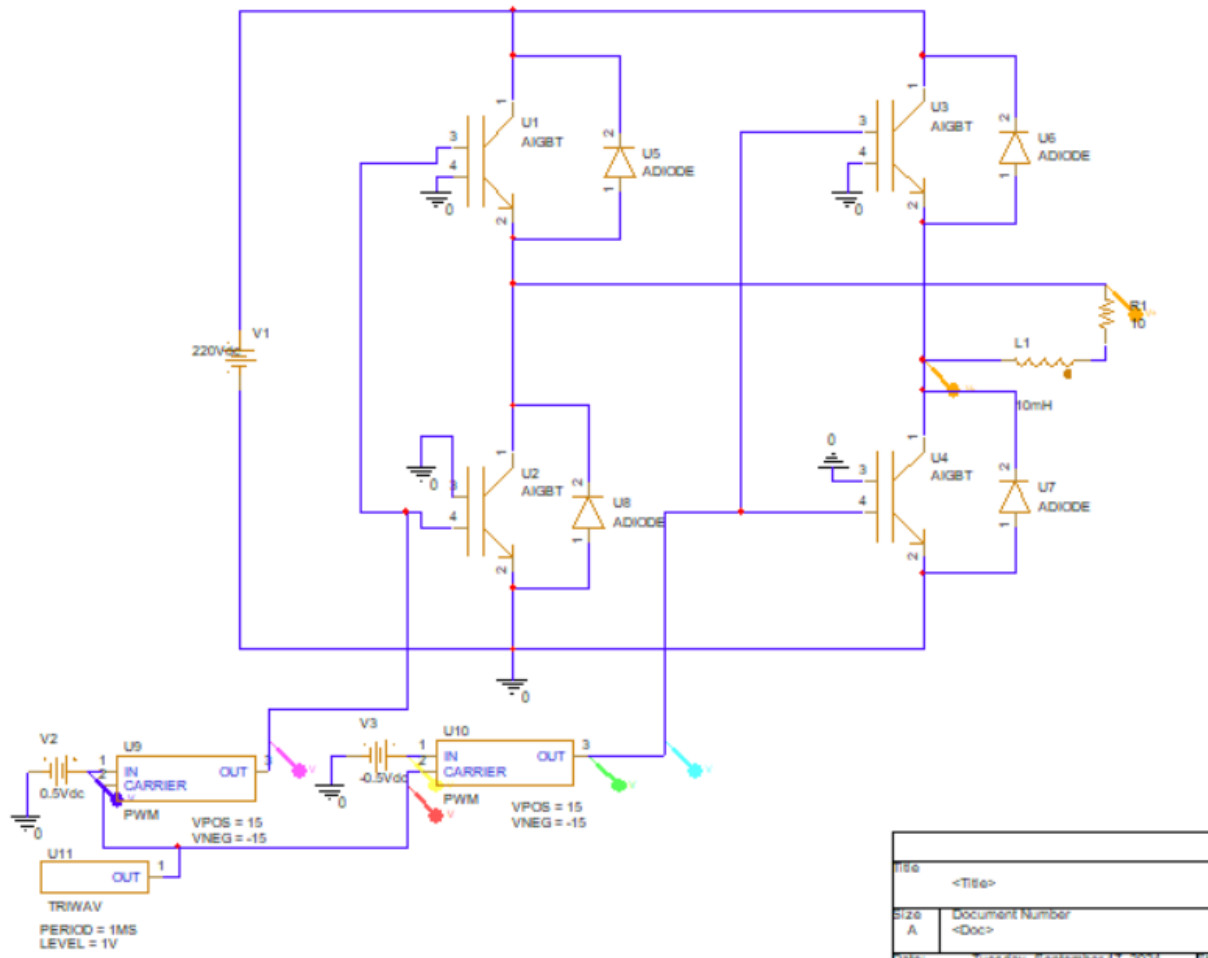


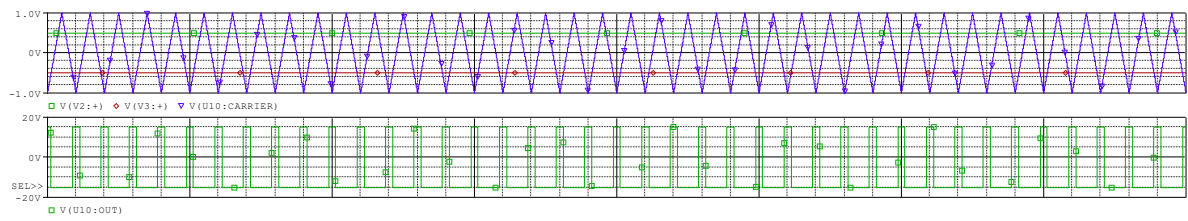
ELEC 4170 Electric Devices
Chapter 3 Lab Report
Bridge Circuits and Pulse-Width Modulation (PWM)
by
[Insert Student's Name]
to
[Insert Professor's Name]

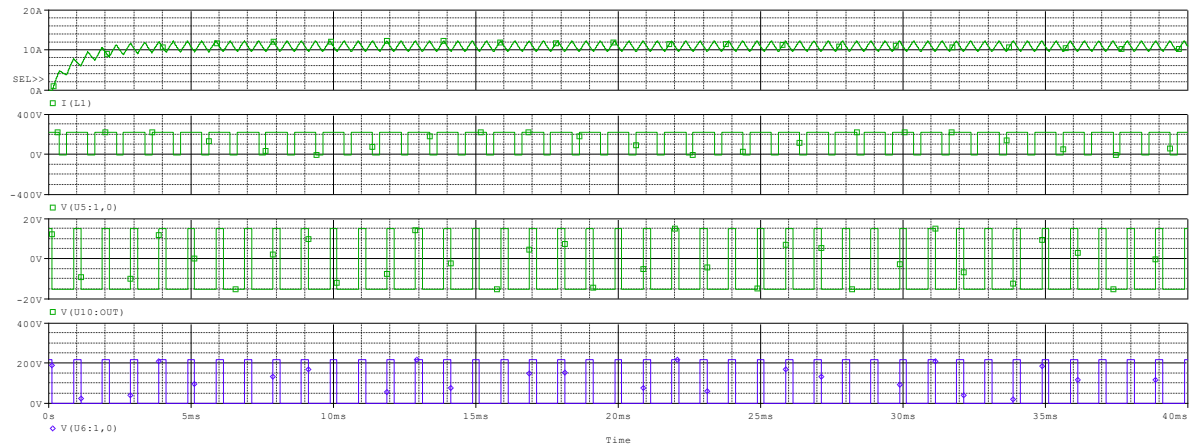
Task 1 : DC/DC bridge circuit with series RL load.

Schematic:



Output Wave forms:

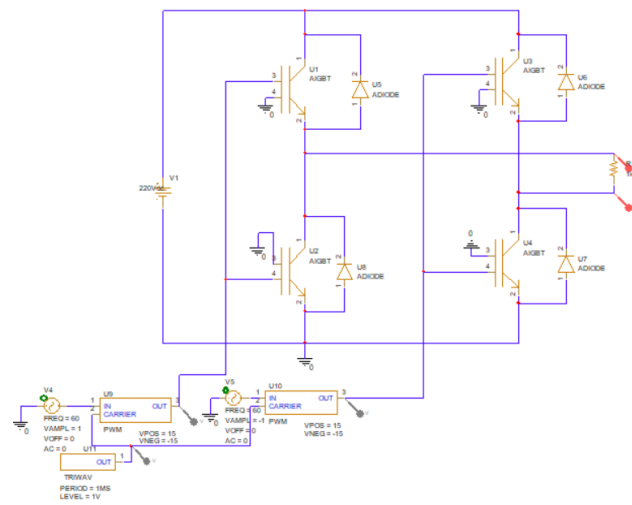




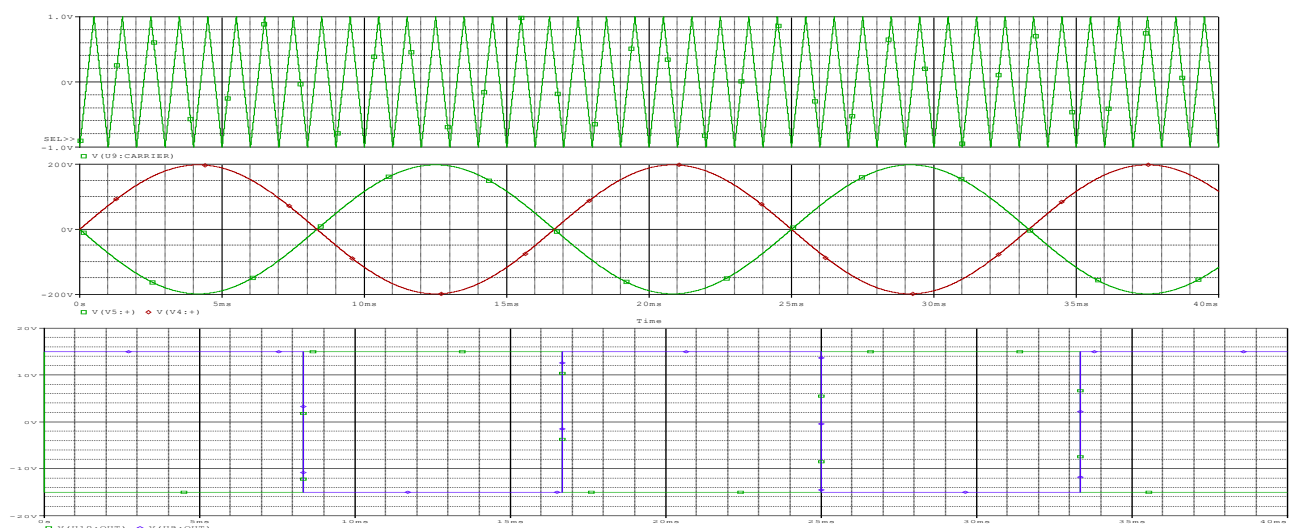
Explanation: In a DC/DC bridge circuit with a series RL load, the inductor stores energy during the switching process, while the resistor dissipates it as heat. The circuit operates efficiently by controlling voltage and current through pulse width modulation (PWM) techniques. This configuration is commonly used in power electronics for applications requiring precise control of energy transfer.

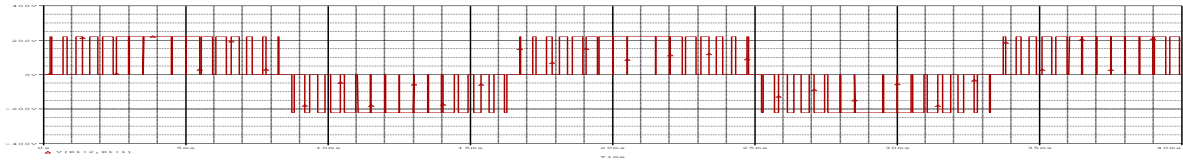
Task 2: Single-Phase DC/AC inverter with resistive load.

Schematic:



Output

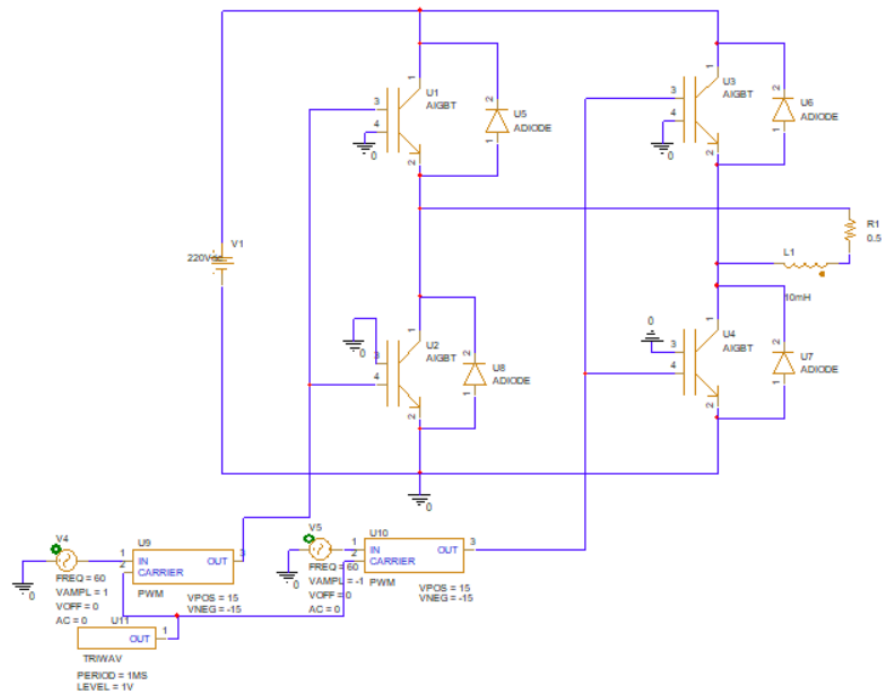




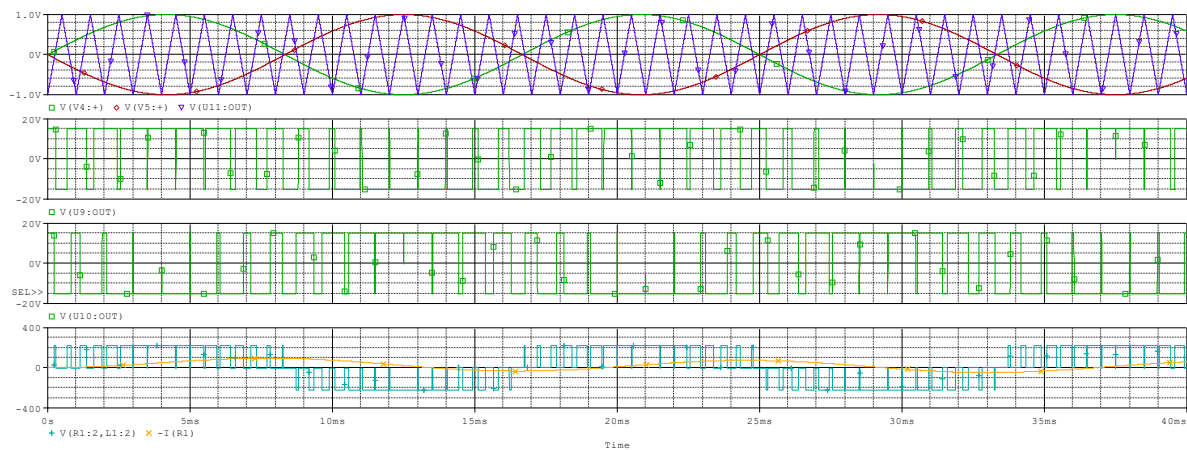
Discussion : In conclusion, the single-phase DC/AC inverter efficiently converts DC power into AC power, ensuring stable output for resistive loads. Its design is straightforward, providing reliable performance for applications requiring pure sine wave generation. This inverter is an essential component in power systems, demonstrating effective energy conversion for household and industrial use.

Task 3: Single-Phase DC/AC inverter with series RL load

Schematic



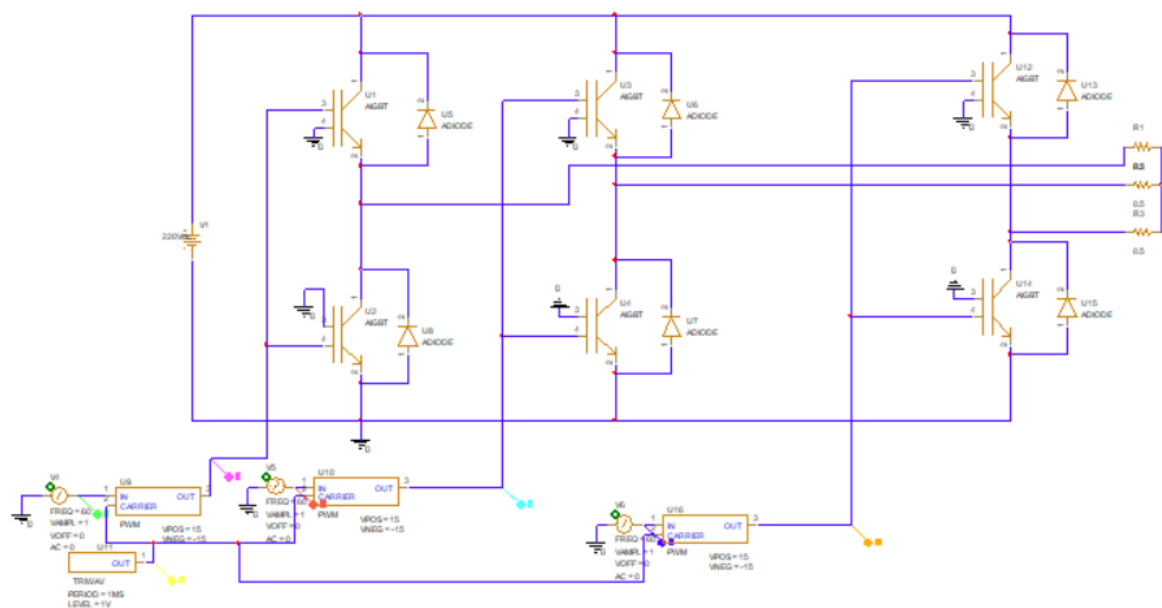
Output



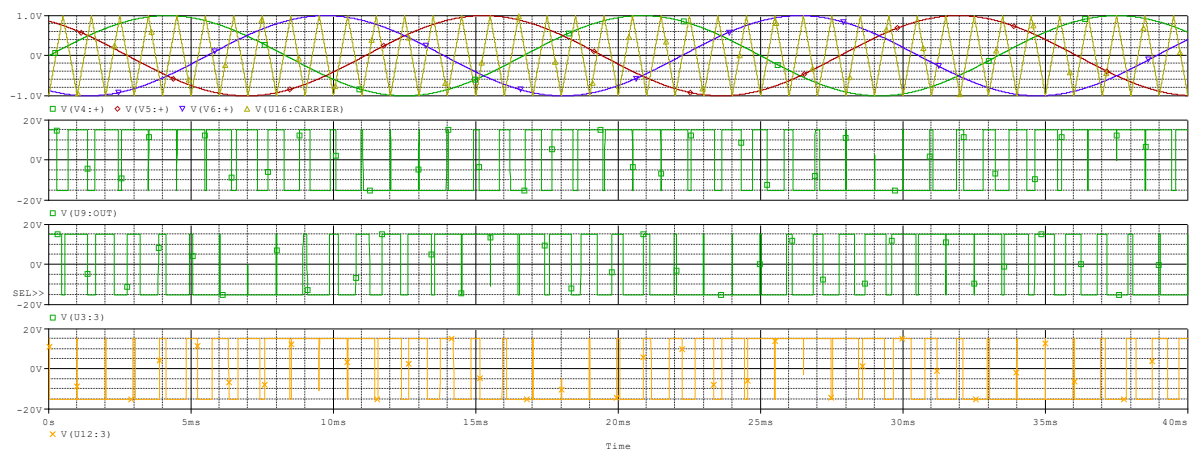
Discussion : In conclusion, the single-phase DC/AC inverter with a series RL load efficiently converts DC to AC power, maintaining stable voltage and current waveforms across resistive-inductive elements. Its performance highlights the importance of selecting appropriate switching strategies and component ratings for minimizing harmonics and ensuring system stability. This inverter design serves as a fundamental building block for power electronics applications, especially in renewable energy systems and motor drives.

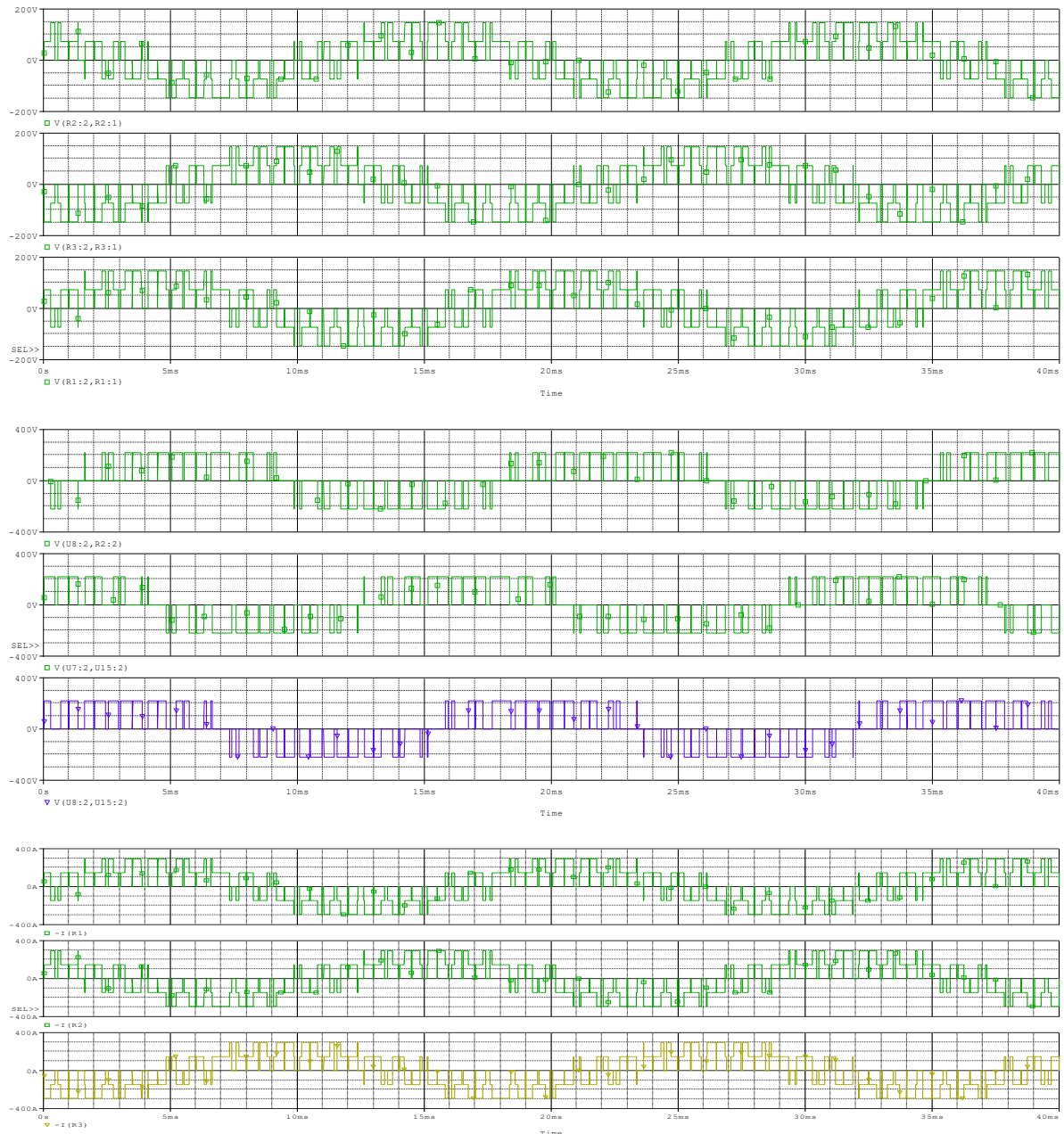
Task 4 : Three-Phase DC/AC inverter with resistive load

Schematic



Output

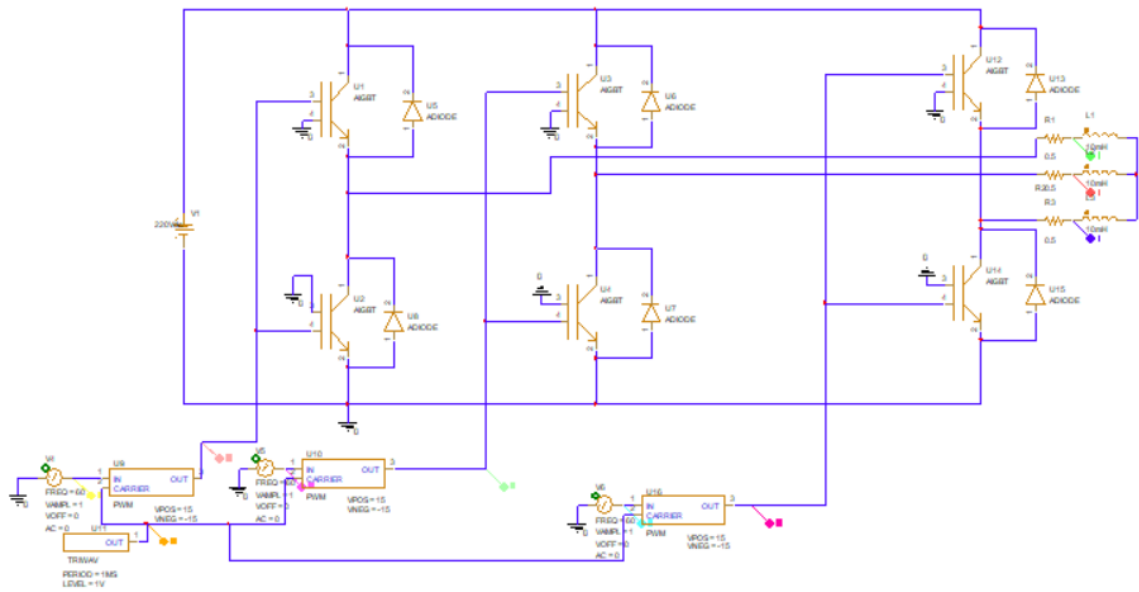




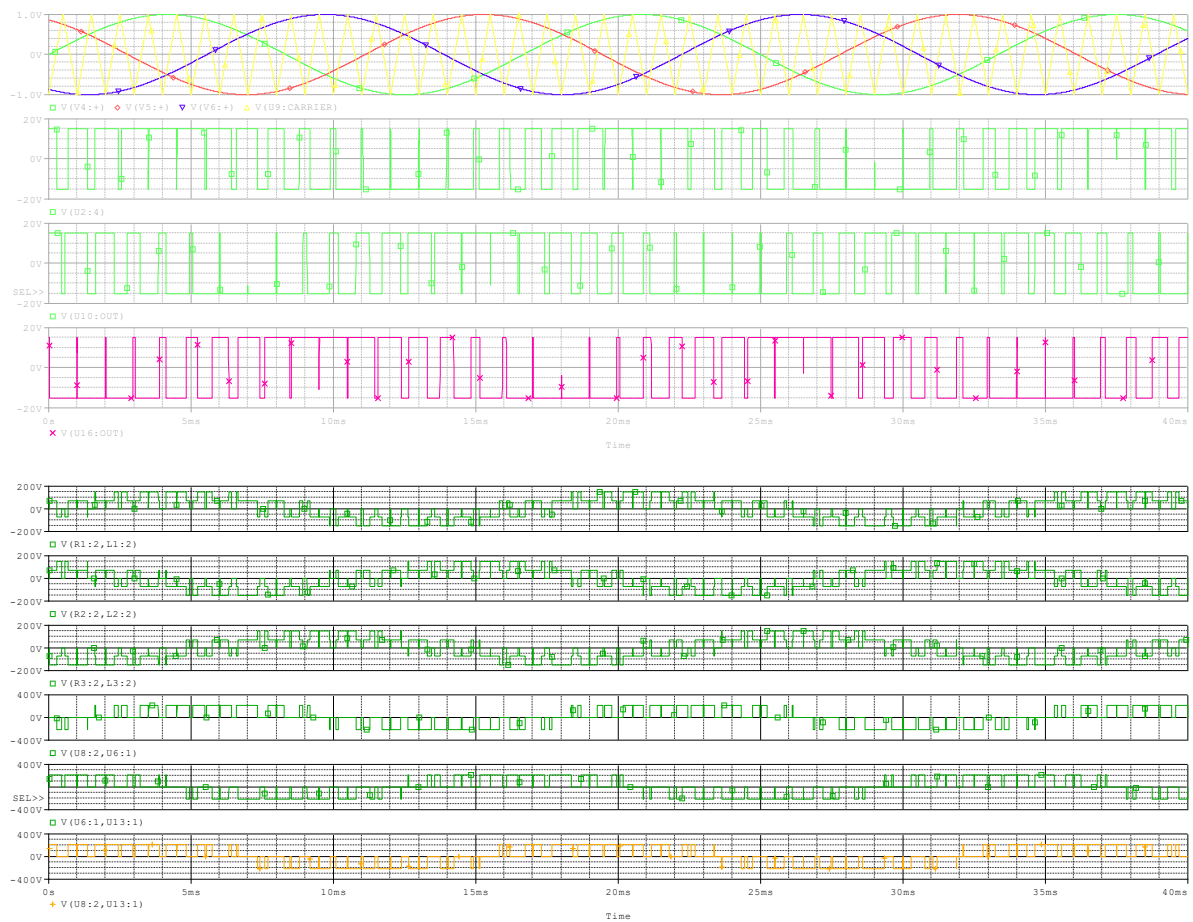
Discussion: A three-phase DC/AC inverter with a resistive load efficiently converts DC power into AC, delivering balanced three-phase output for various applications. This system is essential for driving industrial motors, renewable energy systems, and power distribution networks. Its uses include providing reliable power conversion, improving energy efficiency, and enabling smooth operation of three-phase loads in various industries.

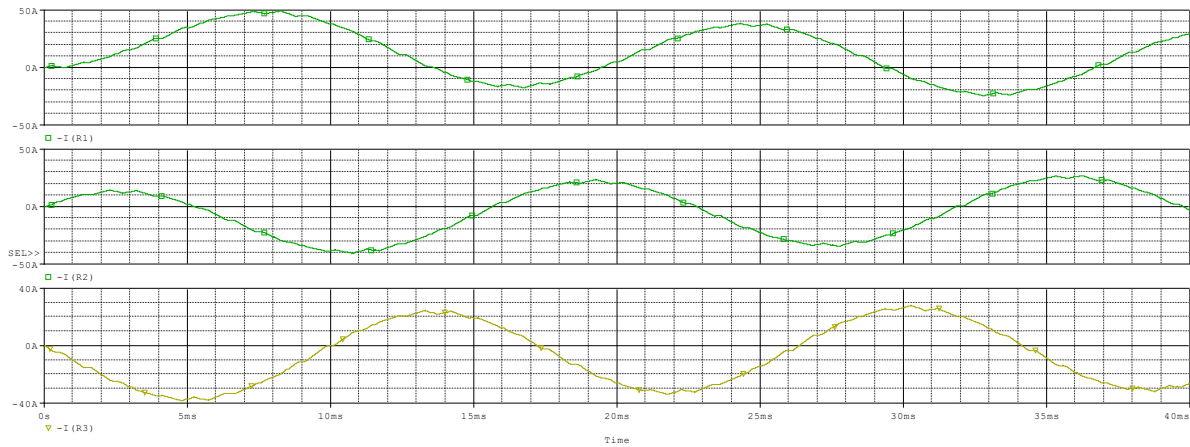
Task 5: Three-Phase DC/AC inverter with series RL load

Schematic



Output





Discussion: The three-phase DC/AC inverter with a series RL load effectively converts DC power into balanced three-phase AC output, suitable for driving inductive loads. It demonstrates efficient power transfer and control over current and voltage waveforms. This setup offers flexibility in power applications where phase synchronization and smooth voltage control are essential.

Uses:

- Powering industrial motors and induction machines.
- Renewable energy systems, such as solar and wind energy conversion.
- Uninterruptible power supplies (UPS) and electric vehicle motor drives.