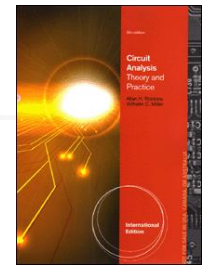


Chapter 07

Series-Parallel Circuits

Analysis of Series-Parallel Circuits

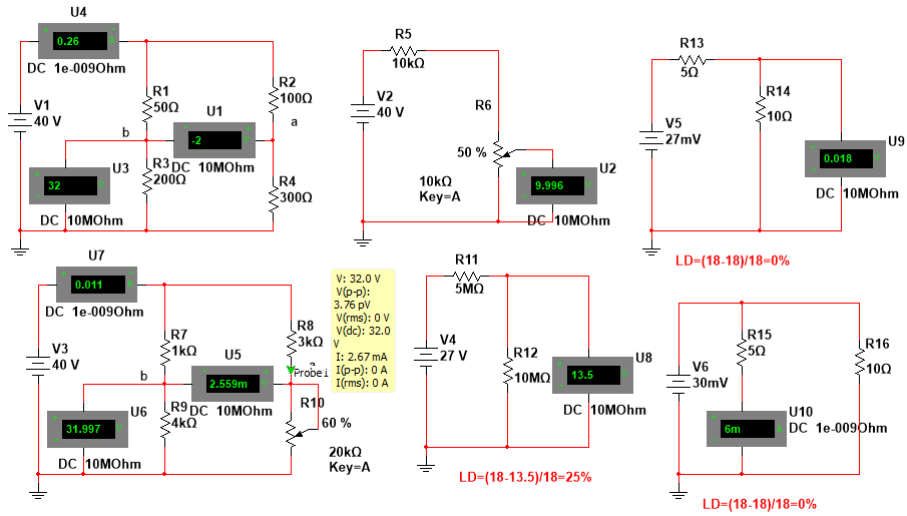
Rules for analyzing series and parallel circuits apply:

- **Same current occurs through all series elements**
- **Same voltage occurs across all parallel elements**
- **KVL and KCL apply for all circuits**

Steps to simplify a circuit:

- Redraw complicated circuits **showing the source at the left-hand side** and then label all nodes
- Simplify recognizable combinations of components
- Determine **equivalent resistance** R_T and solve for the total current
- Label polarities of voltage drops on all components
- **Calculate how currents and voltages split between elements** in a circuit
- Verify your answer by taking a different approach

Get *Voltages and currents* Using Multisim



Kernel abilities

1. **Can recognize which parts are in series or parallel for a series-parallel circuit.**
2. **Can compute the total resistance R_t of resistors $R_1 \sim R_n$ in series-parallel.**
3. **Can recognize KVL and KCL for applying a series-parallel circuit.**
4. **Can recognize the voltage divider and current divider for applying a series-parallel circuit.**
5. **Can recognize the loading effect for measuring voltage and current.**