


Chapter 06

Parallel Circuits

 Source: Circuit Analysis: Theory and Practice ©Delmar Cengage Learning



Parallel Circuits

- **Elements in parallel** when they have **exactly two nodes in common**
- **House circuits contain parallel circuits**
- The parallel circuit will continue to operate **even though one component may be open**
- **Elements connected in parallel, Same voltage across them.**

Kirchhoff's Current Law (KCL)

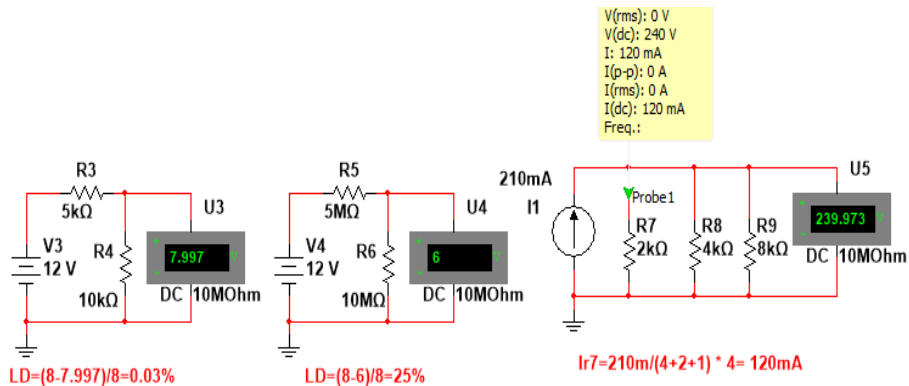
- The algebraic sum of the **currents entering and leaving a node** is equal to **zero**
- **Sum of currents entering a node is equal to the sum of currents leaving the node**

Resistors in Parallel

- **Voltage** across all parallel elements in a circuit will be **the same**
- For a circuit with 3 resistors: $I_T = I_1 + I_2 + I_3$

$$R_T = 1 / (1/R_1 + 1/R_2 + 1/R_3)$$

Multisim



Kernel abilities

1. What is **total resistance R_t** of resistors $R_1 \sim R_n$ in **parallel**? Please give an example.
2. Total resistance for two resistors in parallel is the **product over by sum**.
3. What is **KCL**? Please give an example.
4. What is **current divider in a parallel circuit**? Please give an example. (larger resistance smaller current)
5. What is **loading effect of measuring voltage**? Please give an example. (depending on the internal resistance of a voltage meter)