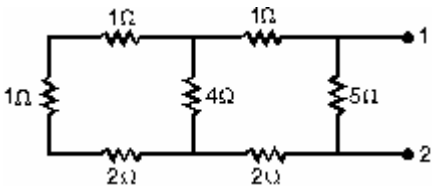
1. A portion of a circuit is shown, with the values of the currents given for some branches. What is the direction and value of the current *i*?

A) ↓, 6A
B) ↑, 6A
C) ↓, 4A
D) ↑, 4A
E) ↓, 2A

2. A total resistance of 3.0 Ω is to be produced by combining an unknown resistor *R* with a 12 Ω resistor. What is the value of *R* and how is it to be connected to the 12 Ω resistor?
A) 4.0 Ω, parallel
B) 4.0 Ω, series
C) 2.4 Ω, parallel
D) 2.4 Ω, series
E) 9.0 Ω, series

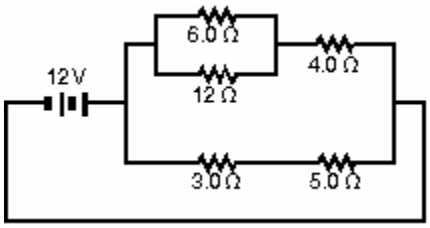
3. Nine identical wires, each of diameter *d* and length *L*, are connected in parallel. The combination has the same resistance as a single similar wire of length *L* but whose diameter is:
A) 3*d*
B) 9*d*
C) *d*/3
D) *d*/9
E) *d*/81

4. The equivalent resistance between points 1 and 2 of the circuit shown is:



A) 4 Ω
B) 4.5 Ω
C) 6 Ω
D) 3 Ω
E) 2.5 Ω

5. The current in the 5.0-Ω resistor in the circuit shown is:



A) 0.42 A
B) 0.67 A
C) 1.5 A
D) 2.4 A
E) 3.0 A

6. A 2-Ω resistor and a 4-Ω resistor are connected in parallel to a 6-V battery. The rate of thermal energy dissipated by the 2-Ω resistor is:
A) 8 W
B) 6 W
C) 9 W
D) 18 W
E) none of these

Answer Key --

1. A
2. A
3. A
4. E
5. C
6. D