KEY

Circuits Worksheet

Multiple Choice

____ 1. The following three appliances are connected in series to a 120 V house circuit: a toaster, 1200 W; a coffee pot, 750 W; and a microwave, 6.0×10^2 W. If all were operated at the same time, what total current would they draw?
a. 3 A
b. 5 A
c. 10 A
d. 21 A

____ 2. Three resistors connected in series carry currents labeled I_1, I_2, and I_3, respectively. Which of the following expresses the total current, I_t, in the system made up of the three resistors in series?
a. $I_t = I_1 + I_2 + I_3$
b. $I_t = (1I_1 + 1/I_2 + 1/I_3)$
c. $I_t = I_1 = I_2 = I_3$
d. $I_t = (1I_1 + 1/I_2 + 1/I_3)^{-1}$

____ 3. Three resistors connected in parallel have voltages labeled ΔV_1, ΔV_2, and ΔV_3. Which of the following expresses the total voltage across the three resistors?
a. $\Delta V_t = \Delta V_1 + \Delta V_2 + \Delta V_3$
b. $\Delta V_t = (1/\Delta V_1 + 1/\Delta V_2 + 1/\Delta V_3)$
c. $\Delta V_t = \Delta V_1 = \Delta V_2 = \Delta V_3$
d. $\Delta V_t = (1/\Delta V_1 + 1/\Delta V_2 + 1/\Delta V_3)^{-1}$

____ 4. Three resistors with values of R_1, R_2, and R_3 are connected in series. Which of the following expresses the total resistance, R_t, of the three resistors?
a. $R_t = R_1 + R_2 + R_3$
b. $R_t = (1/R_1 + 1/R_2 + 1/R_3)$
c. $R_t = R_1 = R_2 = R_3$
d. $R_t = (1/R_1 + 1/R_2 + 1/R_3)^{-1}$

____ 5. Three resistors with values of 3.0 Ω, 6.0 Ω, and 12 Ω are connected in series. What is the equivalent resistance of this combination?
a. 0.58 Ω
b. 1.7 Ω
c. 7.0 Ω
d. 21 Ω

____ 6. Three resistors with values of 4.0 Ω, 6.0 Ω, and 10.0 Ω are connected in parallel. What is their equivalent resistance?
a. 20.0 Ω
b. 7.3 Ω
c. 6.0 Ω
d. 1.9 Ω

____ 7. Two resistors with values of 6.0 Ω and 12 Ω are connected in parallel. This combination is connected in series with a 4.0 Ω resistor. What is the overall resistance of this combination?
a. 0.50 Ω
b. 2.0 Ω
c. 8.0 Ω
d. 22 Ω

____ 8. Three resistors with values of 18 Ω, 26 Ω, 9 Ω, respectively, are connected in series. What is their equivalent resistance?
a. 9.2 Ω
b. 53 Ω
c. 60 Ω
d. 13 Ω

____ 9. Three resistors with values of 15 Ω, 41 Ω, 58 Ω, respectively, are connected in parallel. What is the overall resistance of this combination?
a. 9.2 Ω
b. 53 Ω
c. 60 Ω
d. 13 Ω

____ 10. Two resistors with values of 6.0 Ω and 12 Ω are connected in parallel. This combination is connected in series with a 2.0 Ω resistor and a 24 V battery. What is the current in the 2.0 Ω resistor?
a. 2.0 A
b. 4.0 A
c. 6.0 A
d. 12 A