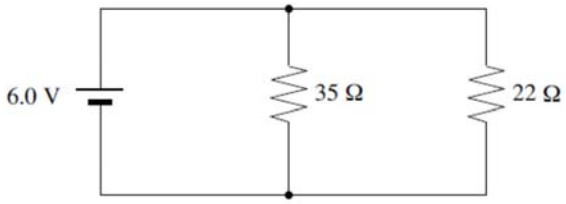
NAME: _____KEY_____

Circuits Review

1.) In an electric circuit, 6.25×10^{18} electrons flow past one point in $0.10\ s$. What is the current?

$6.25 \times 10^{18} \times 10 = 6.25 \times 10^{19}\ \frac{elctrons}{s}$ $1\ C = 6.24 \times 10^{18}\ \frac{electrons}{s}$ $I = \frac{6.25 \times 10^{11}}{6.24 \times 10^{18}}$ $I = 10.0\ A$

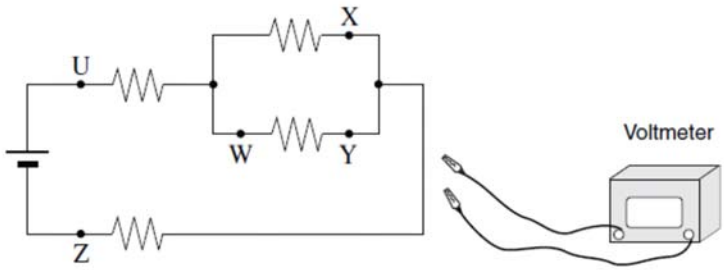
2.) What current would be drawn from the power supply in the circuit shown below?



$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$ $\frac{1}{R_p} = \frac{1}{35} + \frac{1}{22}$ $R_p = 13.51\ \Omega$

$V = IR$ $6.0 = I \times 13.51$ $I = 0.44\ A$

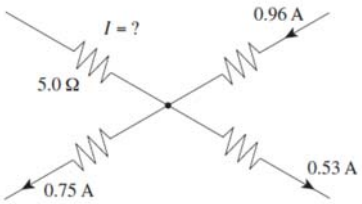
3.) A student needs to connect a voltmeter to measure the potential difference across the parallel resistors in the circuit shown right. Across which two connection points should the student connect the voltmeter? WX/WY



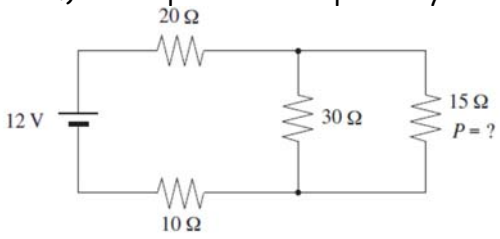
4.) A circuit junction is shown below. What is the current and its direction through the $5.0\ \Omega$ resistor? B

Kirchhoff's law says "current into ajunction equals current out of the junction"

	CURRENT	DIRECTION
A.	0.32 A	away from junction
B.	0.32 A	towards the junction
C.	2.24 A	away from junction
D.	2.24 A	towards the junction



5.) What power is dissipated by the $15\ \Omega$ resistor in the circuit shown?



$P = I^2R$ $P = (0.20)^2(15)$ $R = 0.60\ \Omega$

6.) A student is instructed to determine the amount of charge flowing past a point in a circuit of unknown resistance during an experiment. What equipment will permit the student to do this?

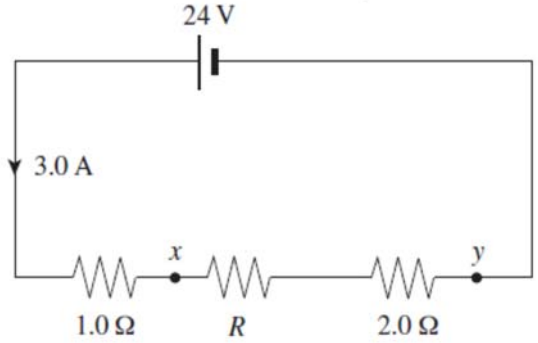
a.) voltmeter

b.) ammeter, voltmeter

c.) ammeter, stopwatch

d.) voltmeter, stopwatch

7.) A series circuit consists of a battery and three resistors arranged as shown in the diagram below. What is the potential difference V_{xy}?



$V_t = V_1 + V_2$ $V_t = 6 + 15$ $\underline{V_t = 21\ V}$

8.) A $12\ V$ battery is connected to a $20.\ \Omega$ resistor. How much charge flows through the battery in $3.5\ s$?

$V = IR$ $12 = I \times 20.$ $I = 0.60\ A$

$I = \frac{Q}{t}$ $0.60 = \frac{Q}{3.5}$ $\underline{Q = 2.1\ C}$

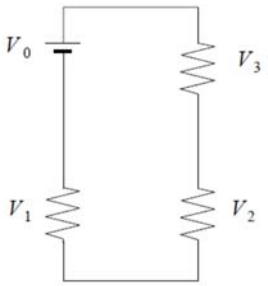
9.) Which of the following relationships correctly applies to the circuit shown? A

A. $V_0 = V_1 + V_2 + V_3$

B. $V_0 + V_1 = V_2 + V_3$

C. $V_0 = V_1 = V_2 = V_3$

D. $\frac{1}{V_0} = \frac{1}{V_1} + \frac{1}{V_2} + \frac{1}{V_3}$

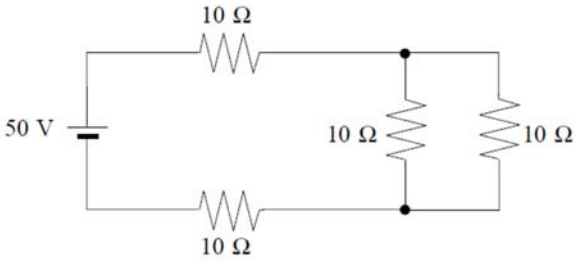


10.) In the following circuit, what current is drawn from the battery?

$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$ $\frac{1}{R_p} = \frac{1}{10} + \frac{1}{10}$ $R_p = 5.0\ \Omega$

$R_s = R_1 + R_2 + R_3$ $R_s = 10 + 5 + 10$ $R_p = 25\ \Omega$

$V = IR$ $50 = I \times 25.$ $\underline{I = 2.0\ A}$



11.) A $75\ W$ bulb is connected across a $120\ V$ source. While the bulb is lighted, what is the effective resistance of the bulb?

a.) $0.62\ \Omega$

b.) $1.6\ \Omega$ $P = \frac{V^2}{R}$ $75 = \frac{120^2}{R}.$ $\underline{I = 192\ \Omega}$

c.) $47\ \Omega$

d.) $\underline{190\ \Omega}$

Answers: 1.) $10.0\ A$, 2.) $0.44A$, 3.) W&X or W&Y, 4.) B, 5.) $0.6\ W$, 7.) $21\ V$, 8.) $2.1\ C$, 9.) A, 10.) $2.0\ A$, 11.) D