

AP Physics B Electrical Circuits Test Review

Name _____

TEST TOPICS

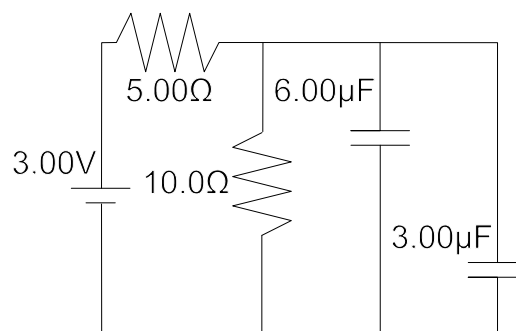
- Ammeter and Voltmeter Function and Hook-Up
- Ohm's Law
- Short Circuits and Overloads
- Fuses and Circuit Breakers
- Power in Circuits (Calculations, Consequences)
- Resistivity and Superconductivity
- Resistors and Rheostats
- Series Circuit Properties and Predictions
- Parallel Circuit Properties and Predictions
- Series, Parallel, and Complex Circuit Analysis
- Dry Cell Combinations
- Capacitors (Properties, Function, Combinations, Circuit Analysis)

ANSWERS FOR PROBLEMS ONE AND TWO

- 1. a) 2.00 V
- b) 12.0 μC
- c) 9.00 μF
- 2. a) 3.00 Ω
- b) 5.00 Ω
- c) 3.00 V
- d) 9.00 V

ADDITIONAL CIRCUIT ANALYSIS PRACTICE:

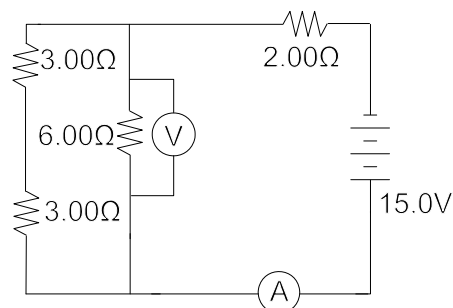
1. Use the diagram at right to answer the following questions.
- a) What is the voltage across the capacitors after they are fully charged?



- b) What is the charge on the 6.00 μF capacitor?
- c) What is the total capacitance of the circuit?

2. Use the diagram at right to answer the following questions.

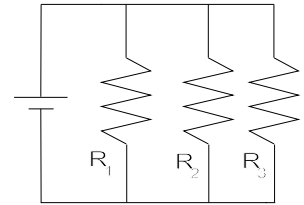
- a) What is the effective resistance of the parallel part of the circuit?



- b) What is the total resistance of the entire circuit?
- c) What is the reading on the ammeter?
- d) What is reading on the voltmeter?

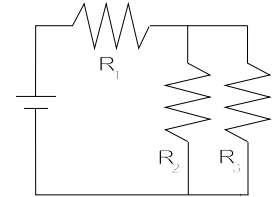
3. Fill out the table for the circuit diagramed at right.

Circuit Position	Voltage (V)	Current (A)	Resistance (Ω)
1			20.0
2		0.300	40.0
3			40.0
Total			



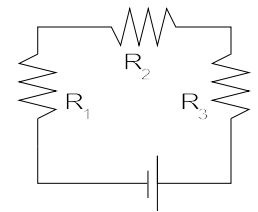
4. Fill out the table for the circuit diagramed at right.

Circuit Position	Voltage (V)	Current (A)	Resistance (Ω)
1		0.200	30.0
2			20.0
3	3.00		
Total			



5. Fill out the table for the circuit diagramed at right.

Circuit Position	Voltage (V)	Current (A)	Resistance (Ω)
1			15.0
2	2.00		
3			30.0
Total			95.0



6. Three resistors are connected in parallel across 20.0 V. The resistors draw a total of 5.00 A. Two of the resistors have values of 24.0 Ω and 12.0 Ω . What is the value of the third resistor?

7. A transistor radio operates by means of a 9.00 V battery that supplies it with 0.0500 A of current.

a) What is the power of the radio in watts?

b) The battery cost is unfortunately \$9.00 per kilowatt•hour. The same radio, by means of a converter, is plugged into a household circuit by a homeowner who pays 5.00¢ per kilowatt•hour. Compute the cost of operating the radio for 300 hours on battery power, and then compute the cost using house current.

6. 8.00 Ω 7. a) 0.450 W b) \$1.22 and 0.675¢

Position	V (V)	I (A)	R (Ω)	NUMBER 3 - PARALLEL			NUMBER 4 - COMPLEX			NUMBER 5 - SERIES		
1	12.0	0.600	20.0	6.00	0.200	30.0	0.600	3.80	0.0400	15.0		
2	12.0	0.300	40.0	3.00	0.150	20.0	2.00		0.0400	50.0		
3	12.0	0.300	40.0	3.00	0.0500	60.0	1.20		0.0400	30.0		
Total	12.0	1.20	10.0	9.00	0.200	45.0	3.80		0.0400	95.0		

ANSWERS: