

**AE-237 Week-2: Series Parallel Lab, part-2** (Show work on this or reverse side)

**NAME** \_\_\_\_\_ **DATE:** \_\_\_\_\_

- Follow instructions on Series-Parallel Lab Setup Sheet
- Once the three LEDs are lit, measure the voltage drop across each one:  
 $V_{\text{redLED}} =$  \_\_\_\_\_  $V_{\text{greenLED}} =$  \_\_\_\_\_  $V_{\text{yellow LED}} =$  \_\_\_\_\_
- Remove the LEDs and replace them with jumpers.
- Confirm that each  $V_{\text{resistor}}$  is the same as the power source:  $V_{\text{load}} =$  \_\_\_\_\_ volts.

**NOTE:** The three circuit 'branches' are in parallel. If some branches contain two series resistors, label as R-#a, R-#b, etc. Measure and notate **ALL** voltages.

- Draw the schematic. Label each component from L-to-R (B1, R1, R2, R3.)

6. Read the resistor color code and translate in the table below

Resistor	1 <sup>st</sup> Band	2 <sup>nd</sup> Band	multiplier	%	calculated	measured
R-1						
R-2						
R-3a						
R-3b						

7. **Calculate** the three branch currents:  $I_1$  \_\_\_\_\_ +  $I_2$  \_\_\_\_\_ +  $I_3$  \_\_\_\_\_ =  $I_{\text{total}}$  \_\_\_\_\_  
 volts across each resistor / calculated resistance

8. **Measure** the three branch currents:  $I_1$  \_\_\_\_\_ +  $I_2$  \_\_\_\_\_ +  $I_3$  \_\_\_\_\_ =  $I_{\text{total}}$  \_\_\_\_\_

9. Measure the total current:  $I_{\text{meas}} =$  \_\_\_\_\_ (current is a series measurement)

10. Resistor Power dissipation:

$R_1 =$  \_\_\_\_\_  $R_2 =$  \_\_\_\_\_  $R_{3a} =$  \_\_\_\_\_  $R_{3b} =$  \_\_\_\_\_

11. Calculate Equivalent 'Network' Resistance: ( $1/R_{\text{total}} = 1/R_1 + 1/R_2 + 1/R_3 + \text{etc}$ )

$1/R_{\text{total}} =$  \_\_\_\_\_  $R_{\text{total}} =$  \_\_\_\_\_

12. Is the total resistance less than the smallest value resistor? \_\_\_\_\_

13. Calculate Total Current (using Equivalent Resistance,  $R_{\text{eq}}$ )  $I_{\text{calc}}$  \_\_\_\_\_

14. Does Total Current  $I_{\text{meas}} = I_{\text{calc}}$  (using  $R_{\text{eq}}$ )? \_\_\_\_\_

15. If 7, 8 9 & 13 do not agree, find your mistake(s).