WORSHEET
Parallel P2

Student Name_____date_____MB#_____

Students should be able to Calculate, Measure and Compare fundamental characteristics of a parallel circuit.

- **Measure (A):** The student will use a Digital Multimeter (DMM), to measure the current (I), voltage (E), and resistance (R) for the P2 circuit on the Miniboard Parallel Trainer (simulator).
- **Calculate (B):** The student will use the principles of ohms law to calculate, current (I), voltage (E), and resistance (R) for the P2 Circuit using the measurements taken with the DMM on the Miniboard Parallel Trainer (simulator) Part A and calculated Part B to perform calculations
- **Compare (C):** The student will then compare the results of the measurements taken and those calculated using the DMM measurements to compare.

Part A Measure

Measuring Voltages:

Measure and record Battery Voltage   a_____

Measure and record Total Voltage Drop for series circuit P2   b _____

Measuring Resistance:

Measure and Record total resistance (Rt) for circuit P2   c_____

Measuring Amperage:

Measure and Record the amperage of circuit P2   d_____

Part B Calculate

Calculate Resistance Total for circuit P2   **E / I=R**

Using the value of the resistors according to color code bands, or the instructor might supply resistance values to the student. (measuring individual resistance values with a DMM are not possible in a Parallel circuit for this reason another method must be used to find individual resistance values) Using the formulas of ohms law to calculate total resistance in a parallel circuit. Calculate the total Resistance for circuit P2.

Calculate resistance total for Circuit P2 by using resistor values for all resistors.

R1 resistance (circle one color bands or   provided)   e_____

R2 resistance (circle one color bands or   provided)   f_____

R3 resistance (circle one color bands or   provided)   g_____

Calculate resistance total (Rt) using parallel formulas   h_____

Calculate Amperage   (E / R) = I

Current flow through any resistor is dependent on the resistance of the resistor. Therefore it must be calculated for each resistor by multiplying resistance of the individual resistor by the total amperage for the circuit (It). Then sum the amperage's for each resistor, to obtain total amperage for that circuit (It) for P1.

Calculate amperage for:

R1 amperage   (b / e)   i_____

R2 amperage   (b / f)   j_____

R3 amperage   (b / g)   k_____

P2 (It) amperage total   sum   l_____

Calculate P2 Total amperage   (b/c)   m_____

<u>Since the amperage has been calculated for R1, R2 and R3 resistance can be calculated for R1, R2 and R3 using the calculated amperage for each resistor and circuit voltage:</u>

Calculate the resistance for R1   (b / i)   n_____

Calculate the resistance for R2   (b / j)   o_____

Calculate the resistance for R3   (b / k)   p_____

Calculate Voltage   (R X I) = E

Calculate P2 total Voltage Drop   (c x d)   o_____

Part C Compare

Record measured and calculated results to complete the following table. Note: letters in each cell refer to your answers above. (Measured and calculated readings should be less than $+-$ 5%)

Voltages	Measured	Calculated	< 5% Difference Y / N
P2 Voltage Drop (Et)	b	p	
Resistance	**Measured** circle one	**Calculated**	
R1 resistance	e /Bands or Provided	n	
R2 resistance	f /Bands or Provided	o	
R3 resistance	g /Bands or Provided	p	
P2 resistance total (Rt)			
Amperage	**Measured**	**Calculated**	
R1 amperage	NA	i	NA
R2 amperage	NA	j	NA
R3 amperage	NA	k Amperage Sum	NA
P2 amperage total (It)	d	m l	