WORKSHEET
Parallel P4
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 Circuit on the P4 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 P4 Circuit using the measurements taken with the DMM on the Miniboard Parallel Trainer (simulator) Part A.
- **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 circuit P4   b _____

Measuring Resistance:

Measure and Record total resistance (Rt) for circuit P4   c_____

Measuring Amperage for circuit P4:

Measure and Record the Total Amperage for circuit P4   d _____

Part B Calculate

Calculate Resistance Total for circuit P4 (E / I)=R
Using the value of the resistors according to color code bands or 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 P4.
Calculate resistance total for Circuit P4 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_____

Calculate Resistance Total (Rt) using resistor values   g_____

Calculate Amperage   (E / R) = I

Current flow through any resistor is dependent on the resistance of the resistor. Therefor 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 P4.

Calculate amperage for:

R1 amperage   (b / e)   h_____

R2 amperage   (b / f)   i_____

P4 (It) amperage total   sum   j_____

Calculate P4 Total Amperage   (b/c)   k_____

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

Calculate the resistance for R1   (b / h)   l_____

Calculate the resistance for R2   (b / i)   m_____

Calculate Voltage   (R X I)

Calculate P4 Total Voltage Drop   (c x d)   n_____

Part C Compare

(measured and calculatedreadings should be within the tolerance 5%)_____

Voltages	Measured		Calculated	< 5% Difference Y / N
P4 Voltage Drop (Et)	b		n	
Resistance	**Measured** circle one		**Calculated**	
R1 resistance	e /Bands or Provided		k	
R2 resistance	f /Bands or Provided		m	
P4 resistance total (Rt)	c		g	
Amperage	**Measured**		**Calculated**	
R1 amperage	NA		h	NA
R2 amperage	NA		i	Amperage Sum	NA
P4 amperage total (It)	d		k	j