WORKSHEET
Parallel P3

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 P3 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 P3 Circuit using the measurements taken with the DMM on the Miniboard Parallel Trainer (simulator) Part A above.
- **Compare (C):** The student will then compare the results of the measurements taken and those calculated.

Part A Measure

Measuring Voltages:

Measure and record Battery Voltage a_____

Measure and record Total Voltage Drop for Parallel circuit P3 b _____

Measuring Resistance:

Measure and Record total resistance (Rt) of circuit P3 c_____

Measuring Amperage:

Measure and Record the total amperage of circuit P3 d_____

Part B Calculate

Calculate Resistance Total for circuit P3 (E / I)

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 P3 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_____

R4 resistance (circle one color bands or provided) h_____

Calculate P3 resistance total (Rt) using parallel formulas i_____

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 P3.

Calculate amperage for:

R1 amperage (b / e) j_____

R2 amperage (b / f) k_____

R3 amperage (b / f) l_____

R4 amperage (b / f) m_____

P3Amperage Sum Total sum n_____

Calculate P3 total amperage (b/c) o_____

Since the amperage has been calculated for R1, R2, R3 and 3R4 resistance can be calculated for R1, R2,R3 and R4 :

Calculate the resistance for R1 (b / h) p_____

Calculate the resistance for R2 (b / I) q_____

Calculate the resistance for R3 (b / I) r_____

Calculate the resistance for R4 (b / I) s_____

Calculate Voltage (R X I)

Calculate P3 total Voltage Drop (c x d) t_____

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**
P3 Voltage Drop (Et)	b		t		
Resistance	**Measured**	**circle one**	**Calculated**		
R1 resistance	e	/Bands or Provided	p		
R2 resistance	f	/Bands or Provided	q		
R3 resistance	g	/Bands or Provided	r		
R4 resistance	h	/Bands or Provided	s		
P3 resistance total (Rt)	c		i		
Amperage	**Measured**		**Calculated**		
R1 amperage	NA		j		NA
R2 amperage	NA		k		NA
R3 amperage	NA		l		NA
R4 amperage	NA		m	Amperage Sum	NA
P3 amperage total (It)	d		o	n	