**Table W-1:** Measured Resistances in Ohms

|  |  |  |
| --- | --- | --- |
| **R1** | **R2** | **R3** |
| 487 | 996 | 12,900 |

**Table W-2:** Equivalent Resistance of Series and Parallel Networks (Ohms)

|  |  |  |
| --- | --- | --- |
| **Resistors** | **Series Configuration** | **Parallel Configuration** |
|  | **Measured** | **Calculated** | **Measured** | **Calculated** |
| **R1 + R2** | 1,478 | 1,483 | 332 | 327 |
| **R1 + R3** | 13,400 | 13,387 | 463 | 469 |
| **R2 + R3** | 13,800 | 13,896 | 921 | 925 |
| **R1 + R2 + R3** | 14,400 | 14,383 | 323 | 319 |

**Sample hand calculations:** for one example of each case below show: 1) the input values, 2) the formulas used, and 3) the calculation with answer (use back of page if more room is needed).

1. Network equivalent resistance for two resistors in series

R1 + R2 in series 1) input values R1 = 487 Ω, R2 = 996 Ω

2) formula used: Re = R1 + R2
 3) Calculation: Re = 487 + 996 = 1483 Ω

1. Network equivalent resistance for two resistors in parallel

R1 + R2 in series

1) input values R1 = 487 Ω, R2 = 996 Ω

2) formula used: $R\_{equivalent }=\left(\frac{1}{^{1}/\_{R\_{1}} + ^{1}/\_{R\_{2}}}\right)$
 3) Calculation: $R\_{equivalent }=\left(\frac{1}{^{1}/\_{487} + ^{1}/\_{996}}\right)= 327 Ω$

1. Network equivalent resistance for three resistors in parallel.

R1 + R2 + R3 in series

1) input values R1 = 487 Ω, R2 = 996 Ω, R3 = 12,900 Ω

2) formula used: $R\_{e }=\left(\frac{1}{^{1}/\_{R\_{1}} + ^{1}/\_{R\_{2}}+ ^{1}/\_{R\_{3}}}\right)$
 3) Calculation: $R\_{e}=\left(\frac{1}{^{1}/\_{487} + ^{1}/\_{996} + ^{1}/\_{12,900}}\right) =319 Ω $

Attach a copy of MATLAB Command line calculations needed to complete the above three cases. (i.e. use the same values as in 1 – 3 above, copy the command window with the inputs and calculations into Word, print out and attach to this worksheet). Turn in before leaving.

**Setup resistance variables**

>> R1 = 487;

>> R2 = 996;

>> R3 = 12900;

**Series Equivalent Resistance for R1 & R2**

**Note:** The bolded titles are not required or expected on this first turn in.

>> R2s = R1 + R2

R2s =

 1483

**Parallel Equivalent Resistance for R1 & R2**

>> R2p = 1/(1/R1 + 1/R2)

R2p =

 327.0748

**Parallel Equivalent Resistance for R1, R2 & R3**

>> R3p = 1/ (1/R1 + 1/R2 + 1/R3)

R3p =

 318.9870