CMGT 235 – Electrical and Mechanical Systems
Homework #23 – Voltage Drop
Due: 11/16/2021
Points: 20

Name: Solution

NEC 2017 Edition, Chapter 9 Tables
Conductor Resistance
Table 8 Conductor Properties – for DC
Table 9 Alternating-Current Resistance – for AC

1. What is the voltage drop of two 12 AWG THHN conductors in a PVC Conduit that supply 16A, 120V AC load located 100 feet from the power supply? Use Uncoated Copper Wires.

   VD = 2 x R x L x I / 1000 = 2 x 2Ω X 100 ft x 16A / 1000 = 6.4 V

2. What is the percentage voltage loss for the circuit in problem 1?

   %VD = [1 – (120V – 6.4V)/120V] x 100 = 5.3%

3. What is the Effective Z at 0.85 PF for Uncoated AWG 10 Copper Wire in a steel conduit?

   NEC 2017 Chapter 9, Table 9
   1.1 Ω / 1000 ft

4. Calculate the length a 12V DC AWG 16 uncoated stranded copper wire that supplies 2.4 A can be if the voltage drop is limited to 5%.

   L = VD x 1000 / 2 x R x I = (12V x 0.05) x 1000 / 2 x 4.99 x 2.4 A = 25 ft