Name: _____

ES34 Homework #1 - Conductor Ampacity and NEC

Problem

1. Consider an array of 20 BP3220 modules, two parallel strings of 10 series-connected modules. Use the attached NEC tables and cut sheets answer the following questions. (show your work for partial credit)

   a) What is the maximum source circuit current for each string in the array?

   b) What is the maximum source circuit current for the PV output circuit (after the source cicuit combiner box)?

   c) What is the required over current device rating for the PV output circuit?

   d) What is the required PV output circuit conductor ampacity?

   e) Based on the circuit requirements, select an acceptable conductor for the PV output circuit. Assume 90C rated insulation and THWN-2 conductors.

   f) If the PV output conductors are in conduit with an ambient temperature of 137F and there are a total of 4 current carrying conductors in the conduit, what is the de-rated ampacity of the conductor?

   g) What is the conductor that you would recommend to satify all NEC ampacity requirements?

2. Consider an array of 20 BP3220 modules, four parallel strings of 5 series-connected modules. Use the attached NEC tables and cut sheets answer the following questions. (show your work for partial credit)

   a) What is the maximum source circuit current for each string in the array?

   b) What is the maximum source circuit current for the PV output circuit (after the source cicuit combiner box)?

   c) What is the required over current device rating for the PV output circuit?

   d) What is the required PV output circuit conductor ampacity?

   e) Based on the circuit requirements, select an acceptable conductor for the PV output circuit. Assume 90C rated insulation and USE-2 conductors.

   f) If the PV output conductors are in free air and operating at an ambient temperature of 155F, what is the de-rated ampacity of the conductor?

   g) The over current device has a terminal rating of 60C and the device is operating at an ambient temperature of 40C. What is the conductor that you would recommend to satify all NEC ampacity requirements?