ECE 320 / ECE 329 NAME _____

Quiz 3 8 February 2012

Transformers

1. (5 points) A small power system is configured as shown in Figure 1. The line reactance is j0.35 Ohms. Both ideal transformers have a 5:1 turns ratio. For an output of 1.0MVA, 480V AC rms, 0.94 power factor at full load, find the voltage regulation.

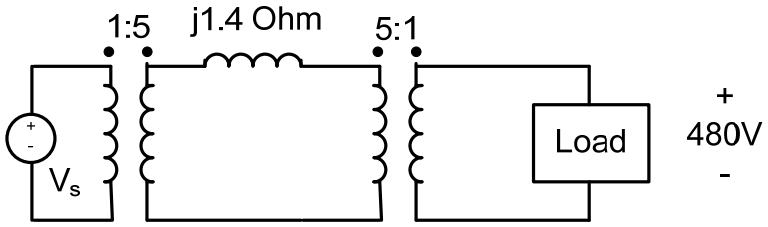

Figure 1. Small Electric Power System.

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Transformers

2. (5 points) A 50kVA, 4160V:480V transformer has the following parameters for its Steinmetz equivalent circuit:

R_{eq} = 13.8 Ohms	Series winding resistance referred to the high voltage side
X_{eq} = 41.5 Ohms	Series leakage reactance referred to the high voltage side
X_M = 92 Ohms	Magnetizing reactance referred to the low voltage side
R_C = 460 Ohms	Core loss resistance referred to the low voltage side

a. (1 points) Draw an appropriate equivalent circuit for this transformer. Label each circuit element.

b. (4 points) When a short circuit test is conducted according to the method prescribed in the textbook, what would you expect the voltage measurement to be?

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