Name (printed): ✳ SOLUTIONS ✳ **Program:** _____

All 5 questions are equally weighted, no partial credit. Circle the correct answer for each question.

1. An ideal transformer has 200 primary turns and 20 secondary turns. What is the secondary voltage if the primary voltage is 120 V?
   a. 1.2 V
   b. 12 V
   c. 120 V
   d. 1200 V
   e. 12,000 V

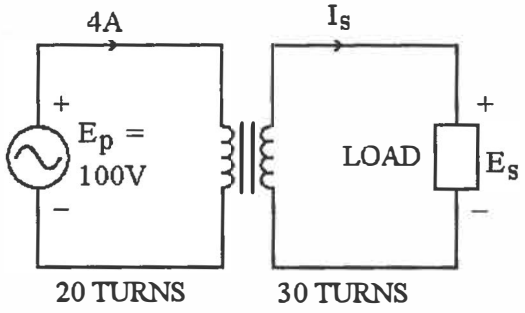
120V ⫴ $\frac{120V}{10} = 12V$

200 : 20

10 : 1

$N_P : N_S$

2. Which of the following terms describes the impedance appearing at the primary of a transformer due to a load connected to the secondary?
   a. Load impedance
   b. Mutual impedance
   c. Reflected impedance
   d. Resonant impedance



$a = \frac{N_P}{N_S} = \frac{20}{30}$

Figure 21.3

Note: Voltages and Currents shown are in RMS

3. **See Figure 21.3.** What is the transformation ratio "a" for this transformer?
   a. 0.667
   b. 1.5
   c. 20
   d. 30

4. **See Figure 21.3.** What is the voltage magnitude, E_S across the load?
   a. 66.7 V
   b. 100 V
   c. 120 V
   d. 150 V

$E_S = \frac{E_P}{a} = 150V$

5. **See Figure 21.3.** If this transformer is ideal, how much power is transferred to the load?
   a. 0 W
   b. 266.7 W
   c. 400 W
   d. 600 W

$P_{primary} = (100V_{RMS})(4A_{RMS}) = 400W$

$\therefore P_{load} = P_P = 400W$