

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

ELECTRICAL ENGINEERING DEPARTMENT

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EE-306

Key Solution

Quiz 3 Sec.: 5 I.D.: Ser#: Name:

Q1. For a non-ideal transformer connected to a resistive load, which sentence is absolutely correct? (3 points)

- a. The secondary-current lags the primary-voltage.
- b. The secondary-current is in-phase with the primary-voltage.
- c. The secondary-current leads the primary-voltage.

Q2. In the approximate equivalent-circuit without magnetization-branch referred to the primary side, the voltage/current equations below are absolutely correct? (4 points)

- a. $V_p = V_s + Z_{eqp} * I_s$ and $I_p = I_s$
- b. $V_p = V_s + Z_{eqp} * aI_s$ and $I_p = aI_s$
- c. $V_p = aV_s + Z_{eqp} * I_s / a$ and $I_p = I_s / a$
- d. $V_p/a = V_s + Z_{eqp} * I_s$ and $I_p/a = I_s$

Q3. The transformer's efficiency can be calculated from any equivalent circuit referred to the primary side as (3 points)

$$\eta = \frac{P_{out}}{P_{in}} = \frac{|V_s||I_s|\cos(\theta_s)}{|V_s||I_s|\cos(\theta_s) + P_{core} + P_{cu}} \times 100\%$$

- a. True.
- b. False.