

# KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

## ELECTRICAL ENGINEERING DEPARTMENT

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EE-306

### Key Solution

Quiz 3      Sec.: 4      I.D.:      Ser#:      Name:

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

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

Q2. The equation below can be used for calculating the primary voltage of non-ideal transformers when using (3 points)

$$V_p = a*(V_s + Z_{eqs} * I_s)$$

- a. the approximate equivalent-circuit with magnetization-branch referred to the primary side only.
- b. the approximate equivalent-circuit with magnetization-branch referred to the secondary side only.
- c. the approximate equivalent-circuit without magnetization-branch referred to the primary side only.
- d. any approximate equivalent-circuit (i.e., with or without) magnetization-branch referred to the secondary side.

Q3. The voltage regulation  $VR$  of a transformer, when calculated using the approximate equivalent-circuit with magnetization-branch referred to the primary side, is (4 points)

- a.  $VR = |(V_p - V_{s,rated}/a)| / |(V_{s,rated}/a)| * 100$
- b.  $VR = |(V_p/a - VI_{s,rated})| / |(V_{s,rated})| * 100$
- c.  $VR = |(Z_{eqp} * I_{s,rated})| / |(V_{s,rated})| * 100$
- d.  $VR = |(aV_p - V_{s,rated})| / |(V_{s,rated})| * 100$