

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

ELECTRICAL ENGINEERING DEPARTMENT

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EE-306

Key Solution

Quiz 1b Ser. #: I.D.: Name:

Q.1 Three identical impedances of $3 - j4$ Ohm are delta-connected and supplied from a three-phase source of 208-V line-line. The phase and line currents absorbed by the load are

- a. $I_{ph} = 41.6 \angle -53.13^\circ$ A ; $I_{Line} = 72.05 \angle -83.13^\circ$ A
- b. $I_{ph} = 24.02 \angle -53.13^\circ$ A ; $I_{Line} = 24.02 \angle -23.13^\circ$ A
- c. $I_{ph} = 24.06 \angle +53.13^\circ$ A ; $I_{Line} = 41.6 \angle +23.13^\circ$ A
- d. $I_{ph} = 41.6 \angle +53.13^\circ$ A ; $I_{Line} = 72.05 \angle +23.13^\circ$ A

Q.2 A three-phase substation bus supplies two wye-connected loads that are connected in parallel. Load 1 draws 50 kW at 0.5 leading power factor, and load 2 draws 36 kVA at 0.866 lagging power factor. The line-to-line voltage at the loads is 460 V.

Total real and reactive power supplied by the substation bus is

- a. $P = 86.0$ kW ; $Q = 68.6$ kVAR (inductive)
- b. $P = 86.0$ kW ; $Q = 13.17$ kVAR (capacitive)
- c. $P = 81.18$ kW ; $Q = 78.9$ kVAR (inductive)
- d. $P = 81.18$ kW ; $Q = 68.6$ kVAR (capacitive)