KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

ELECTRICAL ENGINEERING DEPARTMENT

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EE-360

Key Solution

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

A three-phase transformer bank is formed by interconnecting three single-phase transformers. The three-phase bank is designed to be rated at 300 MVA and 230/34.5 kV. Find the voltage, current, and kVA ratings of each single-phase transformer, both high-voltage and low-voltage windings, if the transformer bank is connected:

a) delta – delta

b) wye – delta

c) wye – wye

d) delta – wye

$$S = 300\ MVA$$

$$V_{2L} = 34.5\ kV$$

$$I_{2L} = \frac{300{,}000}{\sqrt{3}(34.5)} = 5\ kA$$

$$V_{1L} = 230\ kV$$

$$I_{1L} = \frac{300{,}000}{\sqrt{3}(230)} = 753\ A$$

Connection	V_{1p}	I_{1p}	MVA_1	V_{2p}	I_{2p}	MVA_2
$\Delta-\Delta$	230 kV	435 A	100	34.5 kV	2.9 kA	100
$Y-\Delta$	133 kV	753 A	100	34.5 kV	2.9 kA	100
$Y-Y$	133 kV	753 A	100	20 kV	5 kA	100
$\Delta-Y$	230 kV	435 A	100	20 kV	5 kA	100