KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

ELECTRICAL ENGINEERING DEPARTMENT

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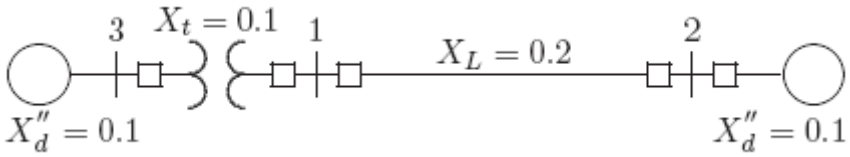
EE-463 - 161

Key Solutions

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

Problem # 1

The one-line diagram of a simple power system is shown below. All impedances are expressed in per unit on a common MVA base. The generators are operating on no load at their rated voltage with their emfs in phase. A three-phase fault occurs at bus 1. Assume pre-fault bus voltages as 1.0 |_0° per-unit. In order to limit the faulted current to –j5 pu, the impedance form bus one to the ground must be



a. 0.08 ∠90°

b. 0.08 ∠−90°

c. 0.0 ∠0° (i.e., solidly grounded)

d. Cannot be found unless the connection types (wye/delta) are provided for all components.

Problem # 2

A solidly wye-connected generator has its terminal "a" open and the other two terminals are connected to each other with a short circuit to ground. The typical values for the symmetrical components of phase "a" current are I_{a1} = 600 ∠ -90° A, I_{a2} = 250 ∠ 90° A, and I_{a0} = 350 ∠ 90° A. The current that flow in the generator's neutral is.

a. 904.1 ∠144.5°

b. 904.1 ∠35. 5°

c. 1050 ∠90°

d. 0.0 ∠0°