Key Solution

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

A 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 current in phase a are $I_{a1} = 600 \angle -90°$ A, $I_{a2} = 250 \angle 90°$ A, and $I_{a0} = 350 \angle 90°$ A. Find the current into the ground and the current in each phase of the generator.

Solution:

$$I_a = -j600 + j250 + j350 = 0$$

$$I_{b1} = 600 \angle 150° = -519.6 + j300$$

$$I_{b2} = 250 \angle 210° = -216.5 - j125$$

$$I_{b0} = 350 \angle 90° = \underline{\quad 0 \quad + j350}$$

$$I_b = -736.1 + j525 = \underline{\underline{904.1 \angle 144.5° A}}$$

$$I_{c1} = 600 \angle 30° = 519.6 + j300$$

$$I_{c2} = 250 \angle 330° = 216.5 - j125$$

$$I_{c0} = 350 \angle 90° = \underline{\quad 0 \quad + j350}$$

$$I_c = 736.1 + j525 = \underline{\underline{904.1 \angle 35.5° A}}$$

$$I_n = I_b + I_c = j1050 \text{ A}$$

$$\text{or } I_n = 3 I_{a0} = 3 \times j350 = \underline{\underline{j1050 \text{ A}}}$$