

Prelab 7 - Synchronous Generator

Read and study the Sections 5.1 - 5.8 of Electric Machinery Fundamentals (by Stephen Chapman), which is posted in the class web page, and solve the following problem.

A 100-kVA 208-V, 60-Hz, Y-connected synchronous generator with a rated field current of 2A was tested, and the following data were taken:

1. $V_{T,OC}$ at the rated I_F was measured to be 220 V.
2. $I_{L,SC}$ at the rated I_F was found to be 100 A.
3. When a dc voltage of 12 V was applied to two terminals, a current of 30 A was measured.

Find the values of (a) armature (stator) resistance and (b) synchronous reactance that would be used in the generator model at the rated condition.