

## EE2029 week 5 quiz on Generator modelling

Solve this questions and upload your workings to Luminus folder

1. A 500 kVA, 11kV three-phase wye-connected synchronous generator has a synchronous reactance of  $6\ \Omega$  and a negligible armature resistance. At a certain field current, the generator delivers rated load at 0.8 leading power factor at 11kV. For the same excitation, what is the armature current and power factor when the input torque is reduced such that the real power output is one third of the previous case?
  
2. Two three-phase generators (G1 and G2) supply power together to a three-phase load connected to the common bus. Generator G1 is a 75kVA, 6.6kV, 50 Hz three-phase wye-connected synchronous generator. It has a resistance of  $0.2\ \Omega$ , a synchronous reactance of  $6\ \Omega$  per phase and supplies 50kW at 0.8 lagging power factor. Generator G2 is a 100kVA, 6.6kV, 50 Hz three-phase wye-connected synchronous generator. G2 has negligible resistance and a synchronous reactance of  $8\ \Omega$  per phase. The three-phase load draws a total of 80kW at 6.6kV with a leading power factor of 0.9.
  - a) Determine the real power and the reactive power supplied by the generator G2.
  - b) Determine the per-phase excitation voltage of generator G2.