MODELLING OF MACHINES

Tutorial Sheet 2 -

Modelling of Slip-Ring Machines using Generalised Machine Theory

1) Starting from the kron equivalent, derive the voltage and torque equations for a 3 phase induction motor, and deduce an equivalent circuit corresponding to steady state operation.

2) A three phase, 2 pole star connected induction motor has a stator leakage impedance of $(0.5+j1.4)\ \Omega$ per phase, and the rotor leakage impedance referred to the stator is $(0.6+j0.5)\Omega$ per phase. Neglecting the magnetizing current, estimate the line current and torque if the machine runs with a slip of 5% when connected to a 400V three phase supply.

3) How could the magnetizing reactance of the machine of question 2 be measured in practice.?