Tutorial on Ind. Motor DT021/3 4th Dec 2012

1. Draw typical T-N, N-T,T-S,S-T characteristics of an induction motor. [6]
2. Show the effect of variation of frequency on N-T characteristics of an induction motor.[2]
3. Show the effect of variation of stator voltage on S-T characteristics of an induction motor. [2]

4. An induction motor has the following parameters and rating:

   6kW, star connected, 4 pole, 1350RPM
   Rs = 0 Ohms, Rr' = 2 Ohms, Xs = Xr' = 3 Ohms, Xm = 240 Ohms

   Use appropriate parameters to answer the following

   a) calculate the ratio of starting torque to full load torque
   b) Calculate the speed of the motor at 45 Hz at rated torque (consider N-T characteristic of the motor up to pull out torque to be linear)
   c) What would be the speed of the motor at 75% of the rated torque at 45 Hz supply frequency?
   d) If the full load torque is adjusted to 1000 RPM (rated torque) what would be the modified synchronous speed in this case ?
   e) What would be the slip for case (d)? [4x5 = 20]