

ECE470 Power Systems I Hints for HW # 3

Selected answers:

1. a) 22.4% b) 80.8% c) 122.9%
2. a) 13.86 k V (phase) d) 292.7 MW
3. Overexcited motor means it has a leading pf. Calculate the Q required to correct the overall pf in the same way as if you were sizing a capacitor bank. Then $S = 25 + jQ$ kVA.
4. Similar to the last problem. Calculate the plant P and Q. Calculate the motor P and hence its Q. Sum P & Q components.
5. Use X_{TOT} to get P_{max} and hence Δ . Ohm's Law gives the current. $\delta = 16.7^\circ$.
6. a) $\delta = 24^\circ$. c) 551.7 Nm
7. $E_f/\delta = 1.714/\underline{21.8^\circ}$