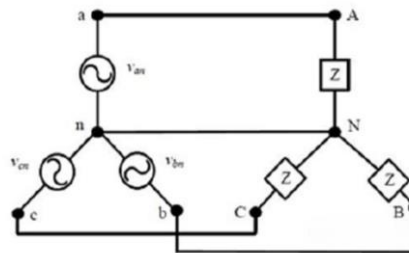


EE 1100 Basic Electrical Engineering
March – June 2023
Tutorial 6

Three Phase AC Circuits

1. A 415 V, 3 phase AC motor has a power output of 10 kW. It operates at a power factor of 0.75 lagging and with an efficiency of 80 %. Assume the motor is delta connected. Find a) input power b) line current and c) phase current.
2. For a balanced 3 phase ac system with load connected in star, $Z_L = 15 + jX \Omega$. Load power dissipated is measured to be 4.5 kW. Given $V_L = 415$ V. Find X.
3. For the balanced Y-Y connected 3-Phase circuit shown in the figure below, the line-line voltage is 208 V rms and the total power absorbed by the load is 432 W at a power factor of 0.6 leading.



Find the value of the load impedance Z

4. A balanced three-phase three-wire system is terminated with two delta connected loads in parallel. Load 1 draws 40 kVA at a lagging PF of 0.8, while load 2 absorbs 24 kW at a leading PF of 0.9. Assume no line resistance, and let $V_{ab} = 440 \angle 30^\circ$ V.

Find (a) the total power drawn by the loads; (b) the phase current I_{AB1} for the lagging load; (c) I_{AB2} ; (d) I_{aA} .

For the reference I_{AB} is phase current and I_{aA} is line current given in below figure,

