1. In the 60Hz circuit shown in Figure 1, \( V_S = 240.0 \, \text{V} \angle 30^\circ \) and \( I_S = 35 \, \text{A} \angle 15^\circ \).

\[
R_1 = 2.5 \, \Omega \\
L_1 = 0.015 \, \text{H}
\]

a) Determine the phasor currents, \( I_1 \) and \( I_2 \), and the impedance \( Z_2 \).

b) Calculate the apparent power delivered by the source and the apparent powers consumed by the resistor, the inductor and the impedance \( Z_2 \). Show that the conservation of power principle holds true for this circuit.

2. A three phase wye-connected balanced load is supplied by a balanced three-phase delta connected source with ‘abc’ sequence. The following source voltage and load impedance are given:

\[
V_{ab} = 11.6 \, \text{kV} \angle 0^\circ \\
Z_{bn} = 250 + j300 \, \Omega
\]

a) Find the phase currents \( I_{an} \), \( I_{bn} \), and \( I_{cn} \), and the neutral current \( I_n \).

b) Draw separate phasor diagrams for the line voltages, phase voltages, and the line currents of part a).