Two balanced, in-parallel connected, three-phase loads are fed by a three-phase line with an impedance of (2+j4) Ω per phase. The first load is Δ-connected with an impedance of (60 ? j45) Ω per phase, and the second load is Y-connected with an impedance of (30 + j40) Ω per phase. The line is energized at the sending end from a 60-Hz, three-phase balanced voltage source with line-to-line voltage of $120\sqrt{3}\,V$ rms. The phase voltage and the per-phase current delivered by the source are given as: $\overline{V}_1 = 120\,V \; and \; I = 5\angle 0^\circ$ correspondingly. Calculate the total three-phase real and reactive power absorbed by each load, and the total three-phase real and reactive power absorbed by the line.

a.
$\overline{S}_1 = 450\,W + j600\,VAR,\ \overline{S}_2 = 1200\,W - j900\,VAR,\ \overline{S}_{Line} = 150\,W + j300\,VAR,$

b.
$\overline{S}_1 = 450\,W + j600\,VAR,\ \overline{S}_2 = 1800\,W - j900\,VAR,\ \overline{S}_{Line} = 150\,W + j800\,VAR,$

c.
$\overline{S}_1 = 450\,W + j600\,VAR,\ \overline{S}_2 = 1200\,W - j900\,VAR,\ \overline{S}_{Line} = 180\,W + j500\,VAR,$

d.
$\overline{S}_1 = 150\,W + j400\,VAR,\ \overline{S}_2 = 1200\,W - j900\,VAR,\ \overline{S}_{Line} = 150\,W - j300\,VAR,$