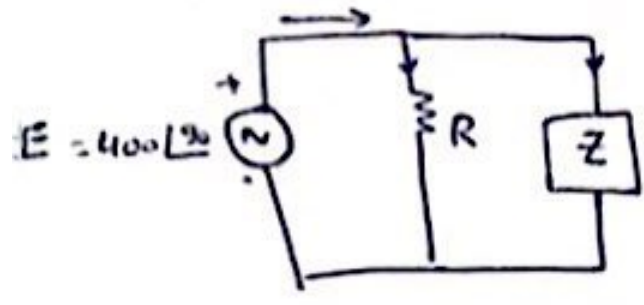


$P_T = 2000 \text{ Watts}$

الحل كأنه توالي
ثم منقلوبه

Find Z , S_T



Answer: $P_T = 2000 \text{ w}$

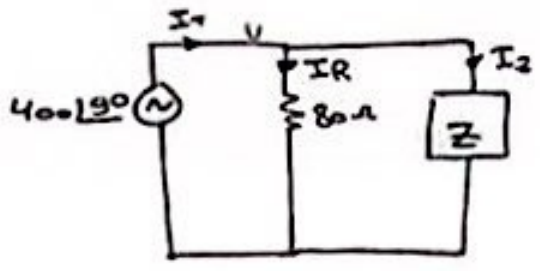
$P_{\text{avery}} = V \cdot I \cdot \cos \theta_z$
 $2000 = 400 \cdot I \cdot \cos \theta_z$

$I = \frac{P}{V \cos \theta_z} = \frac{2000}{400 \cos \theta_z}$

$\theta_z = \theta_v - \theta_i$
 $\theta_z = 90 - 90 = 0$
 $\theta_z = 0$

$P = \frac{V^2}{R} \therefore R = \frac{V^2}{P}$

$R = \frac{400^2}{2000}$ $R = 80 \Omega$



$I_R = \frac{400 \angle 90^\circ}{80 \angle 0}$

$I_R = 5A \angle 90^\circ$

$I_T = \frac{E}{Z_T} = \frac{400 \angle 90^\circ}{?}$

$\theta_{I_R} = \theta_E$

$I_T = 10A \angle 90^\circ$

$I_2 = I_T - I_1 = 10A \angle 90^\circ - 5A \angle 90^\circ$

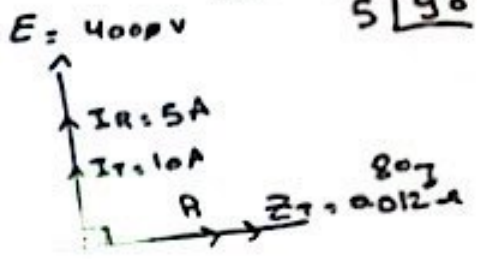
$I_2 = 5A \angle 90^\circ$

لأن I_T يتجزى بين I_1 - I_2 بالتساوي

$Z = \frac{400 \angle 90^\circ}{5 \angle 90^\circ} = \boxed{80 \angle 0}$

كارزيبا

$\frac{1}{Z} = \frac{1}{80} = \boxed{0.0125}$

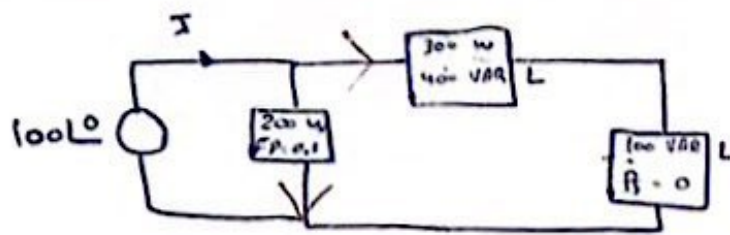


$\theta_z = \theta_v - \theta_i$
 $90 - 90 = 0$

$S_T = R // Z$

$= 0.119$

Q3 Find the Voltages Z_1, Z_2, Z_3
(all elements series.)



3

R	L	C
$S = P$	$S = jQ_c$	$S = -jQ_c$
$P = 0$	$P = 0$	$P = 0$
$Q = 0$	$Q = 0$	$Q = 0$

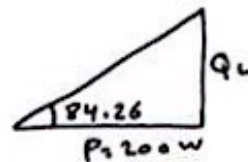
Answer:

Load 1 $P = 200 \text{ W}$

Z_1

$P_f = 0.1$

$\cos^{-1}(0.1) = 84.26$



$Z_1 = R = \dots$

$\tan(84.26) = \frac{Q_L}{200} \therefore Q_L = 1989.68 \text{ [VAR]}$

Z_2

Load 2

$P = 300 \text{ W}$

$Q_L = 400 \text{ VAR}$

Z_3

Load 3

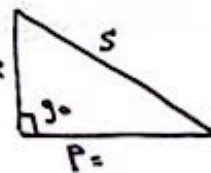
$Q_L = 100 \text{ VAR}$

$P_f = 0$

$\cos^{-1}(0) = 90^\circ$

$P = 0 \text{ W}$

$Q_L = 100 \text{ VAR}$

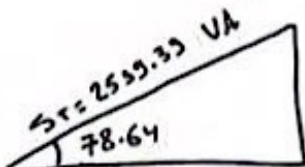
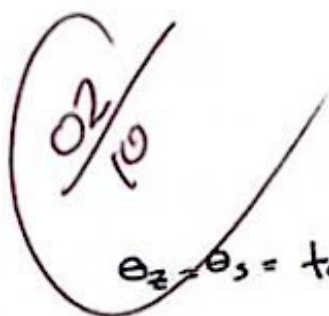


$P_T = P_1 + P_2 + P_3 = 200 + 300 + 0 = 500 \text{ [W]}$

$Q_T = Q_1 + Q_2 + Q_3 = 1989.68 + 400 + 100 = 2489.68 \text{ [VAR]}$

$S_T = \sqrt{P_T^2 + Q_T^2} = \sqrt{(500)^2 + (2489.68)^2}$ $S_T = 2539.39 \text{ VA}$

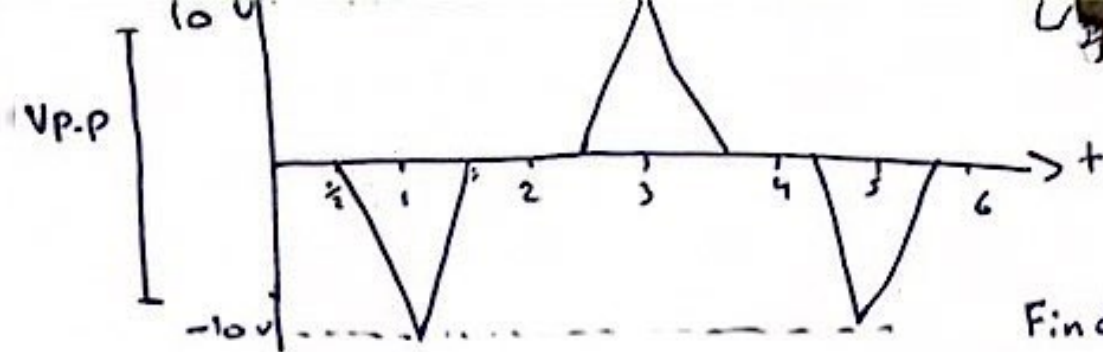
at power triangle



$\theta_z = \theta_s = \tan^{-1} \left[\frac{2489.68}{500} \right]$

$\theta_z = 78.64^\circ$

$\therefore S = I^* \cdot V \therefore I^* = \frac{S}{V} = \frac{2539.39 \angle 78.64^\circ}{100 \angle 0^\circ} = I = 25.39 \text{ A} \angle 78.64^\circ$
 $I = 25.39 \text{ A} \angle -78.64^\circ$



Find \therefore T, F

Answer

$$\therefore T = 2 \text{ ms} \quad F = \frac{1}{T} = \frac{1}{2 \times 10^{-3}} = 500 \text{ Hz}$$

avg
Rms

$$\text{avg} = \frac{(0.5 \times 1 \text{ ms} \times (-10)) + (0.5 \times 3 \text{ ms} \times 10) + (0.5 \times 5 \text{ ms} \times (-10))}{2}$$

$$\text{avg} = -0.015 \text{ V}$$

$$\text{Rms} = \sqrt{\frac{\int_{0.5}^{1.5} (10)^2 \cdot t \cdot dt + \int_{2.5}^{3.5} (10)^2 \cdot t \cdot dt + \int_{4.5}^{5.5} (-10)^2 \cdot t \cdot dt}{2}}$$

$$\text{Rms} = 12.24 \text{ V}$$