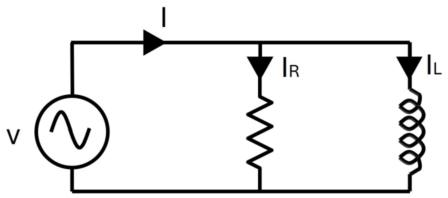
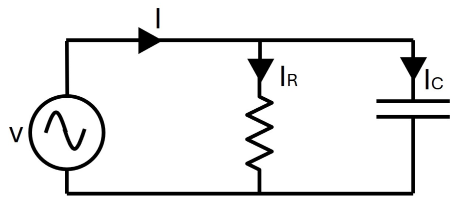
In this topic, we have listed some of the AC Parallel circuit formulas.

For RL and RC Parallel Circuit:

RL Parallel Circuit



RC Parallel Circuit



For RL Parallel and RC Parallel Circuit

$I= \sqrt{I_{R}^{2}+I_{L}^{2}}$

$I= \sqrt{I_{R}^{2}+I_{C}^{2}}$

I= Total line current
I_R= Current flow through the resistance
I_L= Current flow through the inductance
I_C= Current flow through the capacitance

For RL:
$\frac{1}{Z}=\sqrt{\frac{1}{R^2}+\frac{1}{X_L^2}}$
For RC :
$\frac{1}{Z}=\sqrt{\frac{1}{R^2}+\frac{1}{X_C^2}}$

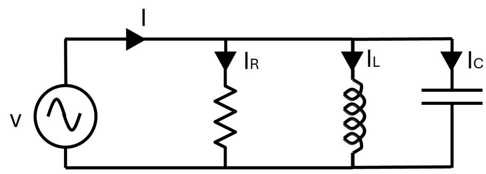
Z= Impedance
R= Resistance
X_L= Inductive Reactance
X_C= Capacitive Reactance

For RL:
$\tan{\phi}=\frac{V_L}{V_R}\ =\frac{X_L}{R}$
For RC:
$\tan{\phi}=\frac{V_C}{V_R}\ =\frac{X_C}{R}$

Circuit current I lags behind the applied voltage V by $\phi^{\circ }$

For parallel RLC Circuit:

RLC Parallel Circuit



For RLC Parallel:
$I= \sqrt{I_R^2 + (I_L – I_C)^2}$

I= Total line current
I_R= Current flow through the resistance
I_L= Current flow through the inductance
I_C= Current flow through the capacitance

For RLC Parallel:

$Y = \sqrt{G^2 + (B_L - B_C)^2}$

$= \sqrt{G^2 + B^2}$

Where,

$Y = \frac{1}{Z}$

$G = \frac{1}{R}$

$B_L = \frac{1}{\omega L}$

$B_C = \omega C$

Y =Admittance
G=Conductance
B_L=Inductive Susceptance
B_C= Capacitive Susceptance
B= Net Susceptance= $B_L - B_C$

$\cos \phi = \frac{G}{Y}$

$\tan \phi = \frac{B}{G}$

Y =Admittance
G=Conductance
B= Net Susceptance= $B_L - B_C$

For RLC Parallel Resonance:

$f_r = \frac{1}{2\pi\sqrt{LC}}$

$\omega_r = \frac{1}{\sqrt{LC}}$

f_r = Resonance frequency
L= Inductance
C= Capacitance