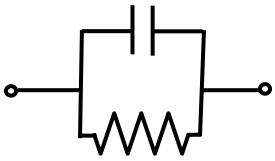
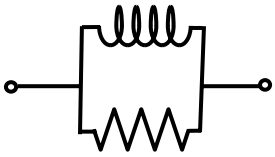
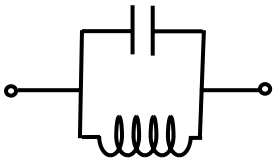
Reactance Quiz



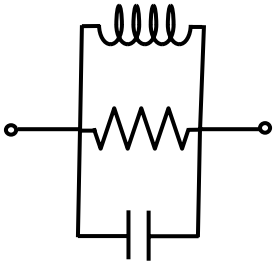
A & E



B & F



C & G



D & H

For each of the above configurations for both $\omega = 0$ and $\omega = \infty$, determine whether or not the resulting circuit appears as either a resistive circuit, a short circuit, or an open circuit. Check the appropriate blank(s).

For $\omega = 0$

Figure	Resistive Circuit	Short Circuit	Open Circuit
A.	_____	_____	_____
B.	_____	_____	_____
C.	_____	_____	_____
D.	_____	_____	_____

For $\omega = \infty$

Figure	Resistive Circuit	Short Circuit	Open Circuit
E.	_____	_____	_____
F.	_____	_____	_____
G.	_____	_____	_____
H.	_____	_____	_____

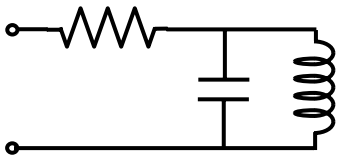
Complex Impedance Quiz

Devise formulas for each of the complex impedance configurations using R, X_C, and X_L.

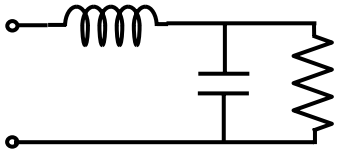
Hint: Impedances in series add, i.e., $Z = Z_1 + Z_2$

Two impedances in parallel equal the "*product over the sum*", i.e. $Z = \dfrac{Z_1 Z_2}{Z_1 + Z_2}$

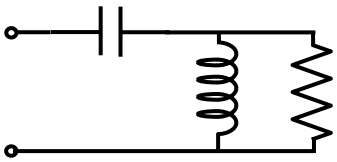
A.



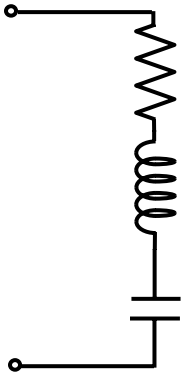
B.



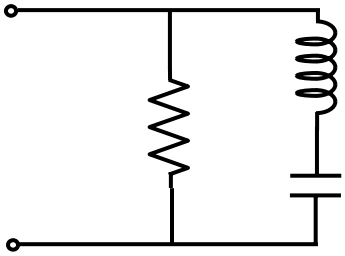
C.



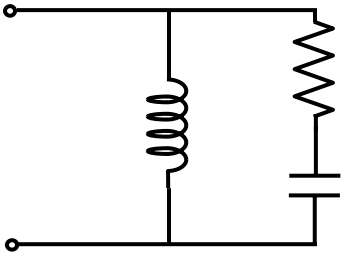
D.



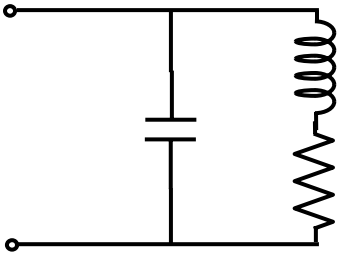
E.



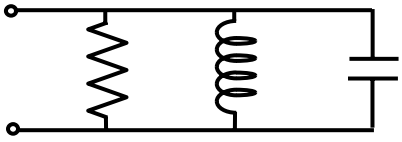
F.



G.



H.



Passive Filter Quick Recognition Quiz

For each of the four schematics, indicate whether or not the configuration represents a *Low Pass Filter* or a *High Pass Filter*.

Hint: Consider the reactance when $\omega = 0$.

$X_L = 0$	$V_L = 0$	$V_R = V_{in}$
$X_C >> 0$	$V_C = V_{in}$	$V_R = 0$

If $V_{out} = V_{in}$, then since $\omega = 0$, passes low frequencies, hence Low Pass Filter.

If $V_{out} = 0$, then since $\omega = 0$, blocks low frequencies, hence passes only high frequencies, i.e., High Pass Filter.

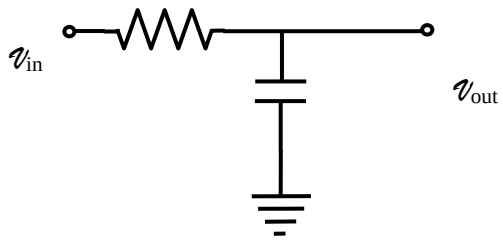
Similarly: Consider the reactance when $\omega >> 0$.

$X_L >> 0$	$V_L = V_{in}$	$V_R = 0$
$X_C = 0$	$V_C = 0$	$V_R = V_{in}$

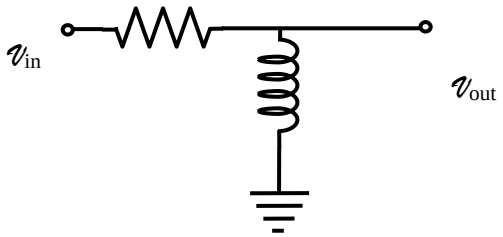
If $V_{out} = V_{in}$, then since $\omega >> 0$, passes high frequencies, hence High Pass Filter.

If $V_{out} = 0$, then since $\omega >> 0$, blocks high frequencies, hence passes only low frequencies, i.e., Low Pass Filter.

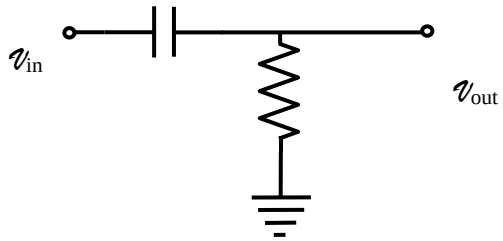
A.



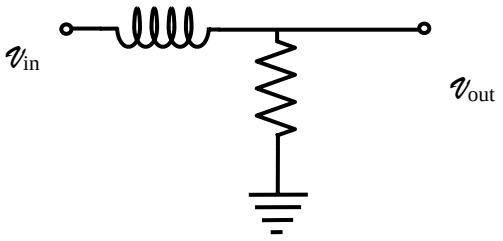
B.



C.



D.



A. _____

B. _____

C. _____

D. _____