

**The University of Jordan
School of Engineering
Electrical Engineering Department**

**EE 374
Electrical Engineering and Machines Lab**

EXPERIMENT 5 REPORT

INDUCTIVE REACTANCE

Section #:_____

Group #:_____

Student Name

ID

1._____	_____
2._____	_____
3._____	_____
4._____	_____

PROCEDURE A - AC-EXCITED SERIES RL CIRCUIT

1. Can we just subtract the magnitudes of $|V_s| - |V_L|$ to obtain the magnitude $|V_R|$? Why or why not?

2. What is the relationship between the periods T of the two signals V_s and V_R ?

Table 1

AC Source Frequency (Hz)	Period T (ms)	V_L (V)	$\angle V_L$ with V_s (Lead = positive)	V_R (V)	$\angle V_R$ with V_s (Lag = negative)	I (mA)	$\angle I$ (degree)
5200							
12000							
22000							
35000							

Table 2

AC Source Frequency (Hz)	X_L (k Ω)	$ Z $ (k Ω)	$\angle Z$ (degrees)
5200			
12000			
22000			
35000			

Table 3

AC Source Frequency (Hz)	$ S $ (mVA)	$\angle S$ (degrees)	P (mW)	Q (mVAR)	PF value	PF lead or lag
5200						
12000						
22000						
35000						

3. Plot the following versus source frequency using the values in Table 1, 2 and 3:

(1) X_L and $|Z|$ on the same plot.

(2) $\angle Z$.

(3) V_L and V_R on the same plot.

(4) P and Q on the same plot

4. From Table 3, at what frequency the real power P and the magnitude of the reactive power $|Q|$ is maximum?

PROCEDURE B - AC-EXCITED PARALLEL RL CIRCUIT

Table 4

AC Source Frequency (Hz)	$V_{R'}$ (mV)	$\angle V_{R'}$ with V_s (Lag= negative)	$V_R = V_L$ (V)	$\angle V_R$ with V_s (degrees)
250				
450				
1000				
1600				

Table 5

AC Source Frequency (Hz)	I (mA)	$\angle I$ with V_s (Lag= negative)	I_R (mA)	$\angle I_R$ with V_s (degrees)	I_L (mA)	$\angle I_L$ with V_s (degrees)
250						
450						
1000						
1600						

1. Can we just subtract the magnitudes of $|I| - |I_R|$ to obtain the magnitude $|I_L|$? Why?

Table 6

AC Source Frequency (Hz)	B_L (mS)	$ Y $ (mS)	$\angle Y$ (degrees)
250			
450			
1000			
1600			

2. Plot the following figures versus source frequency using the values in Table 5, 6 and 7:

- (1) B_L and $|Y|$ on the same plot.
- (2) $\angle Y$ versus source frequency.
- (3) I_L and I_R on the same plot.

END