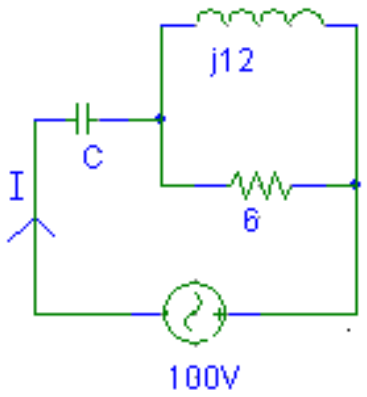
Lecture 32

Q1. The circuit shown in figure operates at a frequency of 50Hz. Determine the value of C such that the input voltage V and the input current I are in the same phase.



Solution:

Since V & I are in phase, circuit must be resistive in nature. Hence, total impedance is resistive which means its j-term is zero.

Total impedance = -jXC + (j12) || 6

= -jXC + 4.8 + j2.4

= 4.8 + j(2.4 – XC)

Equating j-term to zero,

XC = 2.4Ω

Hence, C = 1.326mF