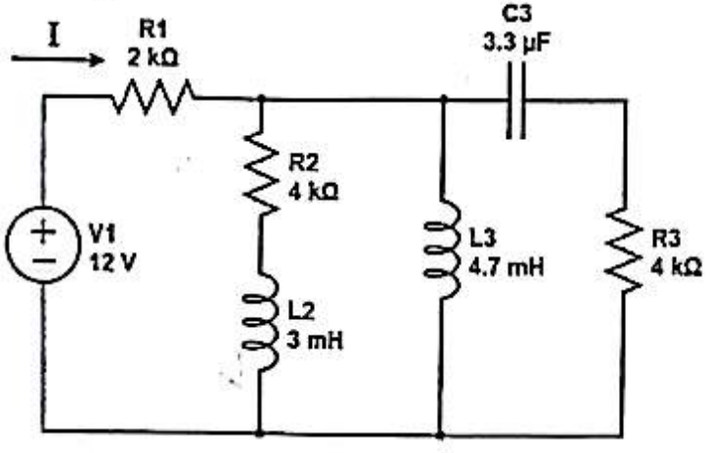
Quiz – 01

Electrical Circuits II [0713-121]

Full Marks: 15 **Time: 15 Minutes**

ID:	Section:

Q1. Calculate I of the following circuit. (10)



Q2. In a series RLC circuit, the source voltage is given by $v(t) = 20\cos(\omega t)$, where $\omega = 10^3$ rad/s, the resistance $R = 400\ \Omega$, the capacitance $C = 200\ \mu F$. If the current flowing through the circuit is given by $i(t) = 35.58\cos(\omega t - 44.64^\circ)$ mA, find the value of the inductance (L). (05)

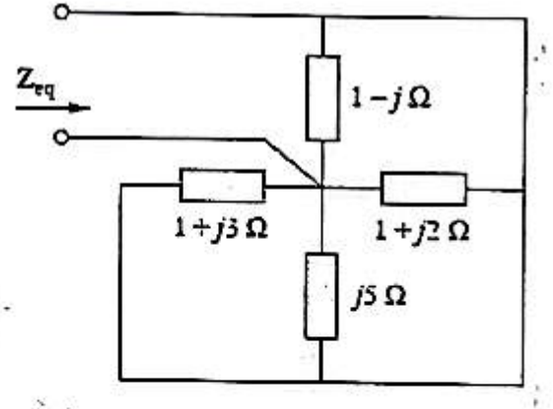
Quiz – 01

Electrical Circuits II [0713-121]

Full Marks: 15 Time: 15 Minutes

ID:	Section:

Q1. Find the equivalent impedance of the following circuit. (10)



Q2. In a series circuit containing a 100 Ω resistor and an unknown capacitor, the voltage across the resistor and the capacitor are equal in magnitude. If the frequency is 60 Hz, calculate the capacitance C. (05)

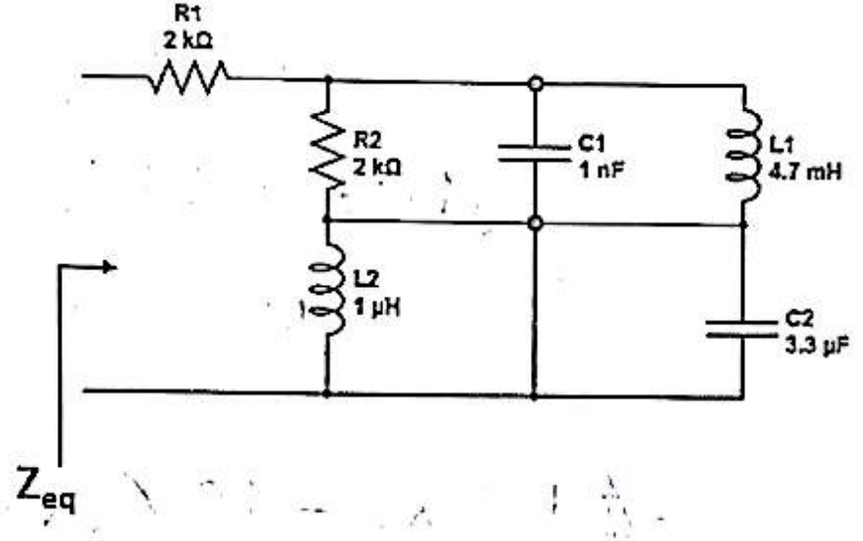
Quiz – 01

Electrical Circuits II [0713-121]

Full Marks: 15 Time: 15 Minutes

ID:	Section:

Q1. Determine the equivalent impedance of the following circuit, when $\omega = 10^3$ rad/s. (10)



Q2. A branch has $\mathbf{Z_1} = 10 + j10\ \Omega$. If you want to add a parallel capacitor $\mathbf{X_c}$ such that the total impedance is purely real, what must be the value of $\mathbf{X_c}$? (05)

Quiz – 03

Electrical Circuits II [0713-121]

Full Marks: 15 Time: 20 Minutes

ID:	Section:

Q1. The circuit diagram in Fig. 1 represents a balanced 3-phase Y-Y system. Find the **line current,** and the **average power delivered to the load.** (07)
[Here, $Z_{Load} = 9 + j12\ \Omega$, and $Z_{line} = 1 + j2\ \Omega$]

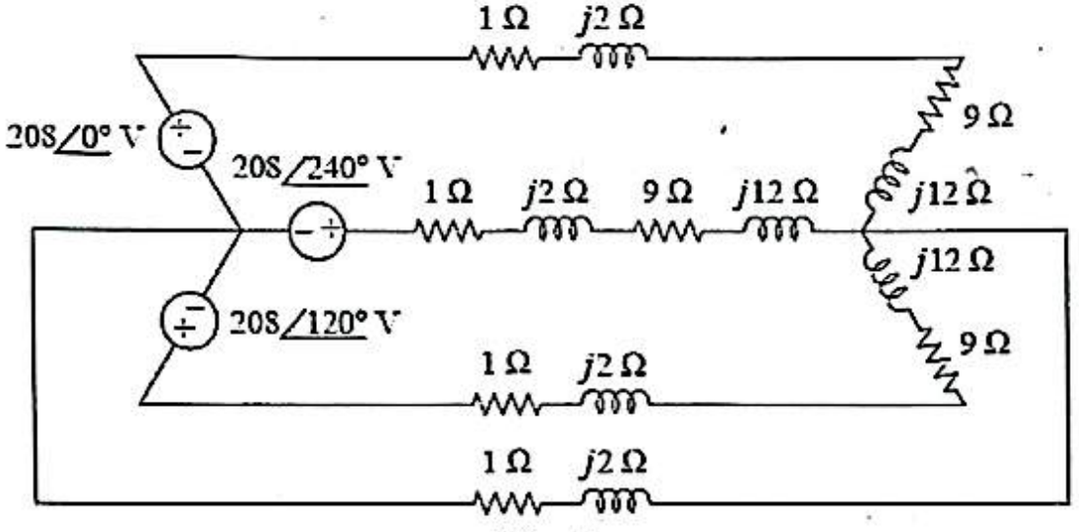


Fig. 1

Q2. Two balanced loads are connected in parallel to a 13.8 kV (rms) line. Load 1 draws 500 kW at 0.7 lagging pf. Load 2 draws 300 kVAR at 0.9 lagging pf. Determine the **total complex power** and the **overall power factor.** (08)

Quiz – 04

Electrical Circuits II [0713-121]

Full Marks: 15 **Time: 20 Minutes**

ID:	Section:

Q1. (08)

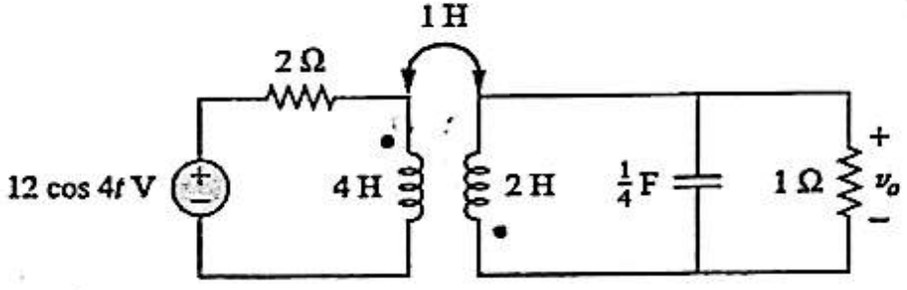


Fig. 1

(a) Find the coupling coefficient.
(b) Calculate v_0.
(c) Determine the energy stored in the coupled inductors at $t = 2$ s.

Q2. Design a bandstop filter that will reject a 200 Hz sinusoid while passing other frequencies. The required bandwidth is 100 Hz, and the only available resistor has a value of 150 Ω. (07)

Quiz – 04

Electrical Circuits II [0713-121]

Full Marks: 15 **Time: 20 Minutes**

ID:	Section:

Q1. (08)

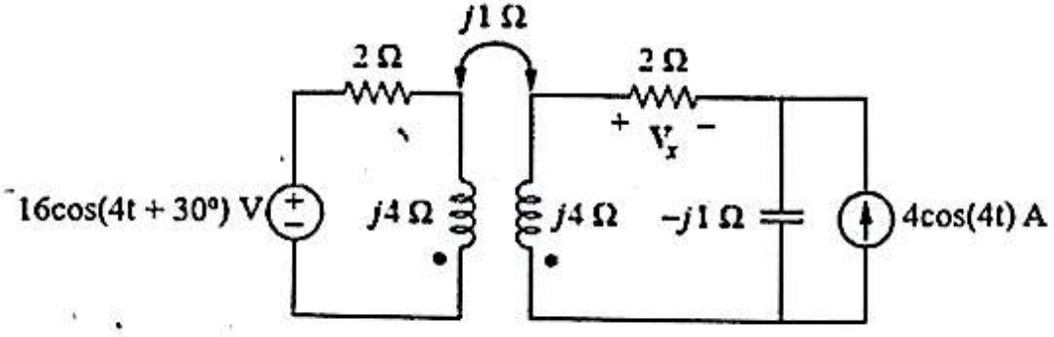


Fig. 1

(a) Find the coupling coefficient.
(b) Calculate $\mathbf{V}_x$.
(c) Determine the energy stored in the coupled inductors at $t = 2$ s.

Q2. Design a bandpass filter with two half-power frequencies given by $\omega_1 = 20.1$ kHz, and $\omega_2 = 20.3$ kHz respectively. The only available resistor has a value of 20 kΩ. Determine the value of L, C. (07)