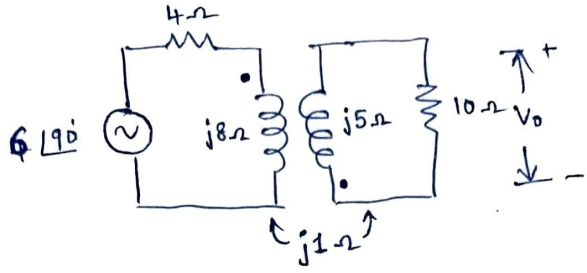
BASIC ELECTRICAL SCIENCES
Assignment-5.

① Determine the voltage V_o in the circuit. Fig1.



Ans: $V_o = 0.6\angle -90^\circ$ V

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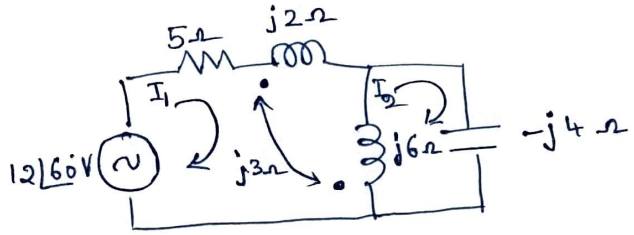
② For the circuit shown in Fig 2., determine the phasor currents I_1 & I_2.



Ans: $I_1 = 1.966\angle 25^\circ$ Amps; $I_2 = 2.949\angle 25^\circ$ Amps.

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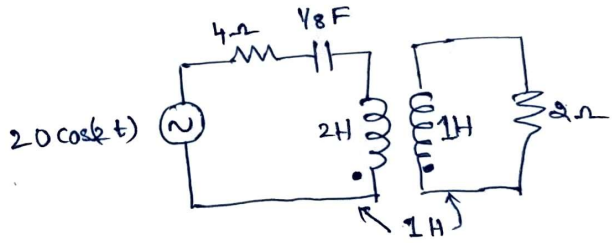
③ Determine the coupling coefficient and the energy stored in the coupled circuits at $t = 1.5$ sec

Ans: $i_1 = -3.916$ Amp.

$i_2 = -1.845$ Amp

$W = 24.29$ J



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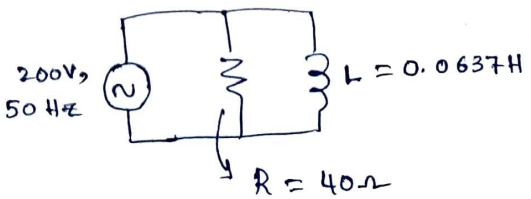
④ The following circuit shows a parallel R-L arrangement connected across 200V, 50 Hz Ac supply. Calculate

(a) Current drawn for the supply

(b) Apparent power drawn from source

(c) Real power drawn from source

(d) Reactive power drawn from source



Ans: (a) 11.18 A

(b) 2.236 kVA

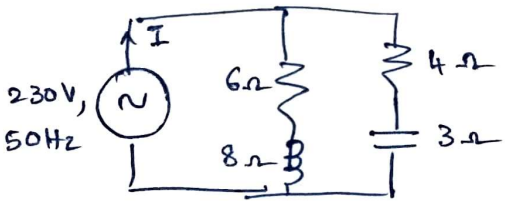
(c) 1 kW

(d) 2 kVAr

(5) For the circuit shown below, determine the total current and the power factor of the circuit.

Ans: $I = 51.43 \angle 10.3^\circ$

$\cos\phi = 0.98$ (lead)



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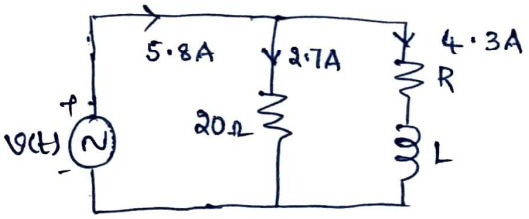
(6) For the below circuit, the inductive current is 4.3A and resistive current is 2.7A. The total current is 5.8A. Find

(a) Power absorbed by inductive branch

(b) Inductance 'L'

(c) Power factor of the source (ie cos. of angle between source Voltage & source current)



Ans: (a) 78.6 W (b) 37.6 mH (c) 0.716 (Lag)

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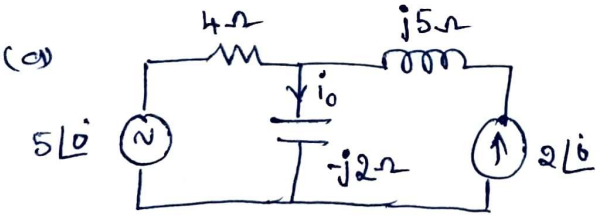
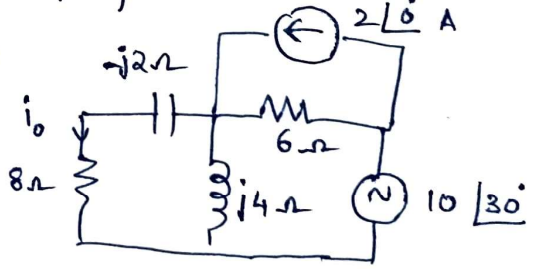
(7) Find the current i_o using superposition theorem

(a)



Ans: $2.9\angle 26.56^\circ$ A

(b)



Ans: $0.81\angle 39.38^\circ$ A

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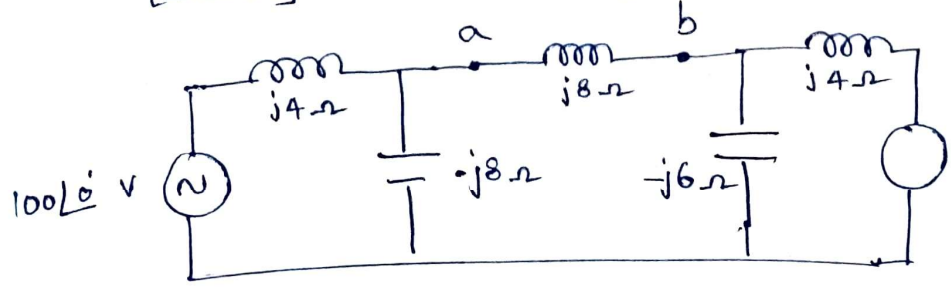
(8) In the network below, find the steady state current in the 8Ω inductor [across ab] using Thevenin's theorem.



Ans: $9.45\angle -169.1^\circ$ Amps

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