

**Midterm I    EEE 117    Date 02/24/2022 (1:30 - 3:00 p.m.)**

**SOLUTION MUST BE HAND WRITTEN AND SUBMIT IT BEFORE 3:00 P.M.**

**Q-1** Use phasor method to add the following sinusoidal: **(20 points)**

$$V_1 = 25 \sin (4000t + 45^\circ)$$

$$V_2 = 72 \sin (4000t + 27^\circ)$$

$$V_3 = 150 \cos (4000t - 87^\circ)$$

$$V_4 = 10 \cos (4000t - 143^\circ)$$

**Q-2** A  $90 \, \Omega$  resistor, a  $32 \, \text{mH}$  inductor, and a  $5 \, \mu\text{F}$  capacitor are connected in series across the terminals of a sinusoidal voltage source. The steady-state expression for the source voltage is  $750 \cos (5000t + 30^\circ) \, \text{V}$ . **(Note: 750 is Max<sup>m</sup> Value)**

Calculate the steady-state current  $i(t)$  by the phasor method. **(20 points)**

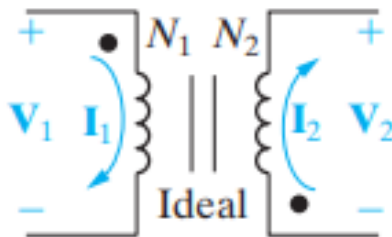
**Q-3** For the following ideal transformer, Find  $V_2$  and  $I_2$ : **(20 points)**

if  $N_1 = 5$

$N_2 = 25$

$V_1 = 3 \, \text{V}$

$I_1 = 1.5 \, \text{A}$



**Q-4** Analyze the circuit and find: **(40 points)**

- Currents and voltages for each branch.
- Complex power "**S2**" in branch 2.
- Active (P), Reactive (Q) and Apparent (S) powers in branch 2.

$$\dot{i}_g = 100 \cos 10000t \, \text{mA}$$

**(100 is Max<sup>m</sup> Value)**

