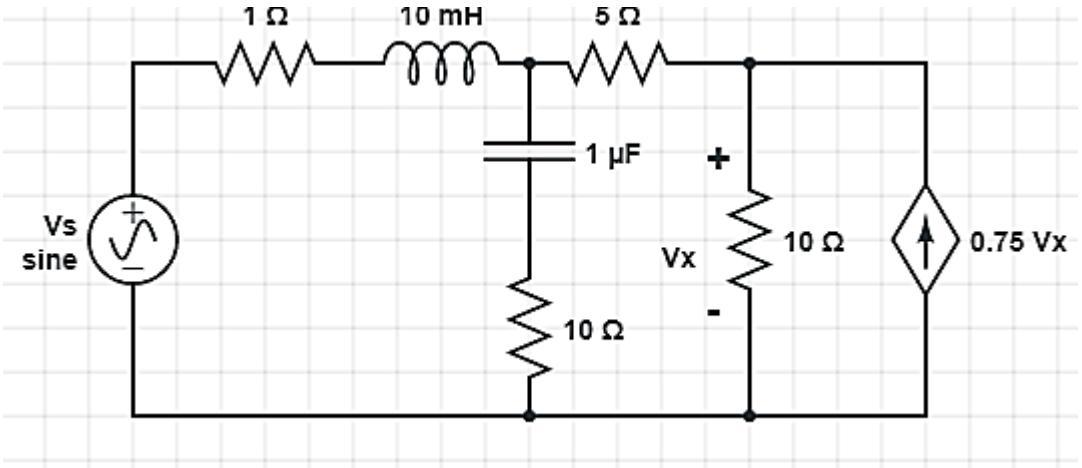
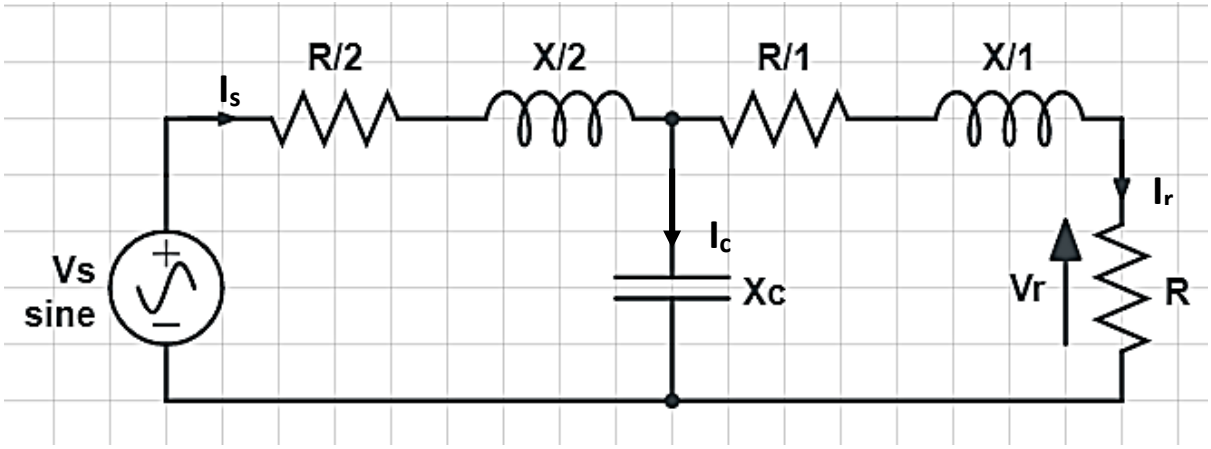
**EE 1100 Basic Electrical Engineering**
**March – June 2023**
**Tutorial 5**
**Single Phase AC Circuits**

1. Determine the current passing through the 1 Ω resistor using nodal analysis. Where the supply voltage $V_s$ = 110+j0 V.

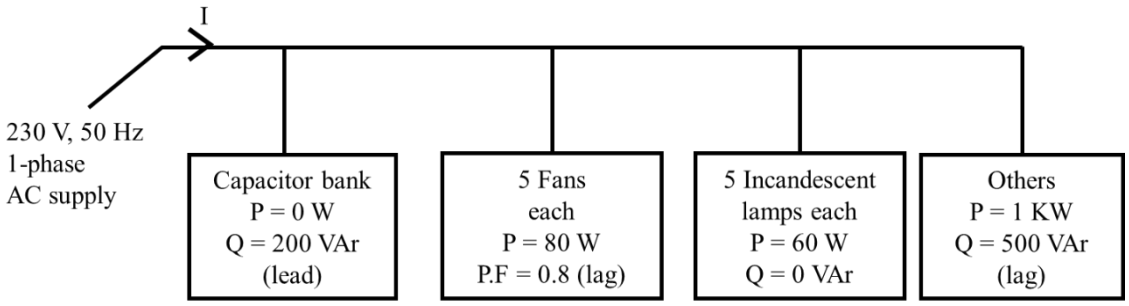



2. Draw the phasor diagram keeping $V_r$ as reference, for the circuit shown below.




3. An iron core inductive coil of resistance and inductance of 10 Ω and 100 mH is connected to 100 V, 60 Hz, 1-phase AC supply.
   a. Determine the total impedance, current passing through the inductor, power factor, and active power consumed by it.
   b. If the inductive coil is changed to air core whose inductance of the coil is 10 mH and power consumed by it is 250 W. determine its resistance, power factor and current passing through it.
   c. An iron inductive coil has a resistance 5 Ω and the power factor of the coil 0.8 lag. Determine the current, power and inductance of the coil.

4. The following fig.1 shows the electrical appliances used in a house. Determine
   a. Total active power, reactive power and apparent power
   b. Current drawn (I) from the power supply
   c. Power factor, and draw the power triangle.




5. Find the value of value of the capacitance needed to correct the load pf to unity in the above given question.