# TUTORIAL-6

EE 101: Basic Electronics

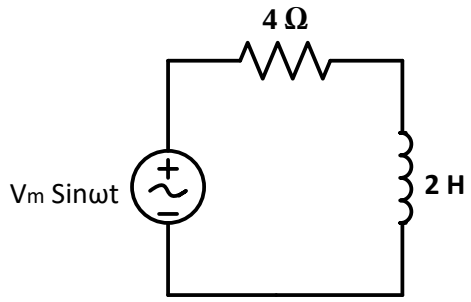
DEPARTMENT OF ELECTRONICS & ELECTRICAL ENGINEERING

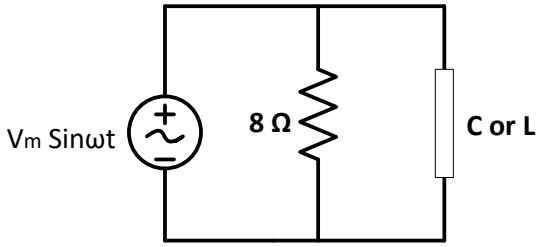
INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

*(First question is the **Pre-Tutorial Assignment problem** to be solved in the space provided.)*

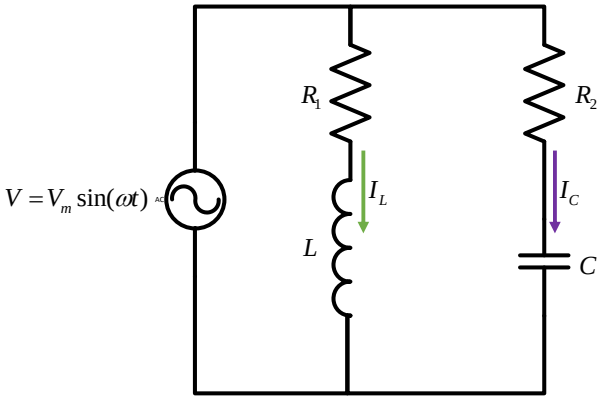
| Name: | Roll No. | Tutorial Group: |
|---|---|---|

**1.** Under what conditions the following ac circuits will be equivalent to each other?



**2.** Draw an approximate phasor diagram for the following circuit and derive the condition for the two branch currents $I_L$ and $I_C$ to be in quadrature.




**3.** Consider the following circuit which has a voltage source of $240\sqrt{2}\ \text{Cos}(100\pi t)$ V. Find its real power, reactive power and power factor. If a capacitor of C = 11.3 μF is connected in parallel with the voltage source, then find its power factor.

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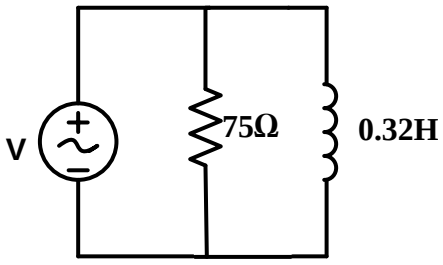
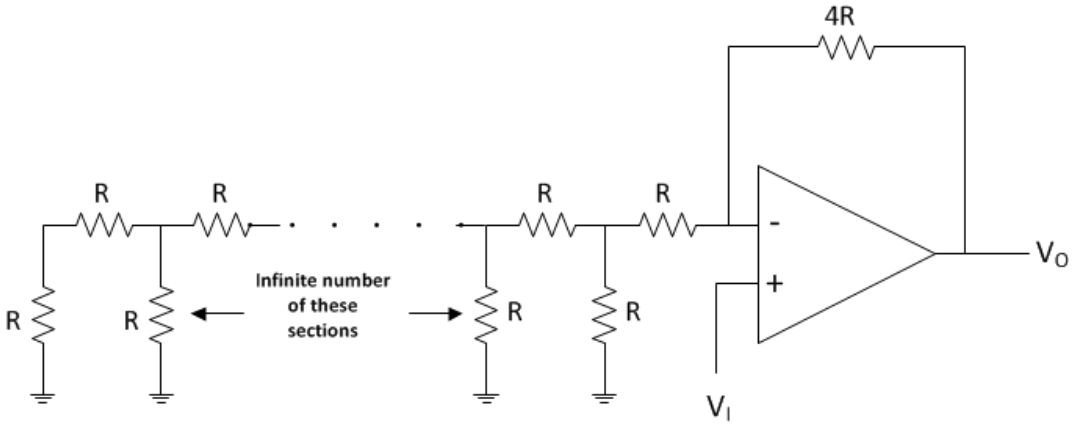


**4.** Find the gain $A_V = \dfrac{V_O}{V_I}$ of the circuit shown.




**5.** Find the output voltage $v_o$ of the circuit given below.