



American International University- Bangladesh (AIUB)
Faculty of Engineering

Course Name:	Introduction to Electrical Circuits	Course Code:	COE 2101
Semester:	Fall 2021-22	Total Marks:	5
Faculty:	Prof. Dr. Mohammad Abdul Mannan	Term	Final

Assignment 03 [Final-TERM] [5 Marks]

Submission Date: November 25, 2021 [Thursday]

General Instruction:

1. Solve the problem to A4-size white paper by your handwritten.
2. Write your **Name, Student ID, Section, Page Number** and value of m_5 on the top of first page.
3. In top of other pages write the **Page Number**.
4. Take picture of your solution for each page individually.
5. **Insert the picture in a word file.**
6. Make word file into PDF format file.
7. Save PDF file using middle five digits of your ID number such as:

$m_1m_2m_3m_4m_5_A03F_IECK_M.pdf$
such as: 45328_A03F_IECK_M.pdf

8. Submit it in VUES.
9. **For each day delay 1 marks will be reduced.**
10. **Picture format file submission will not be considered**

Problem 01: For the **Figure 1:** having $e(t) = 70.8\sin(314t + 60^\circ)$ V, $R = 44 \Omega$, $X_L = 20 \Omega$ and $X_C = 10 \Omega$. [2]

(i) Calculate the admittance and the impedance and write it in both Cartesian and Polar form.

(ii) Draw the admittance diagram.

(iii) Draw the impedance diagram.

(iv) Find the value of C in microfarads and L in henries.

(v) Find the voltage E and the currents I_s , I_R , I_L , and I_C in phasor form.

(vi) Draw the phasor diagram of the currents I_s , I_R , I_L , and I_C and the voltage E .

(vii) Verify Kirchhoff's current law.

(viii) Find the average power, the reactive power and the apparent power to the circuit.

(ix) Draw the power triangle.

(x) Find the power factor of the circuit and indicate whether it is leading or lagging.

(xi) Find the sinusoidal expressions for the currents I_s , I_R , I_L , and I_C .

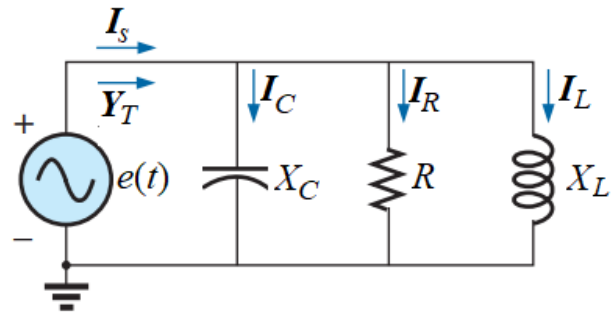


Figure 1

Problem 02: For the **Figure 2:**

(a) (i) Determine the Thévenin's equivalent impedance (Z_{Th}), the Thévenin's equivalent voltage (E_{Th}) and (ii) Draw the Thévenin's equivalent circuit.

(b) (i) Determine the Norton's equivalent impedance (Z_N), the Norton's equivalent voltage (I_N) and (ii) Draw the Norton's equivalent circuit.

(c) Find the load impedance Z_L for maximum power to the load, and find the maximum power to the load.

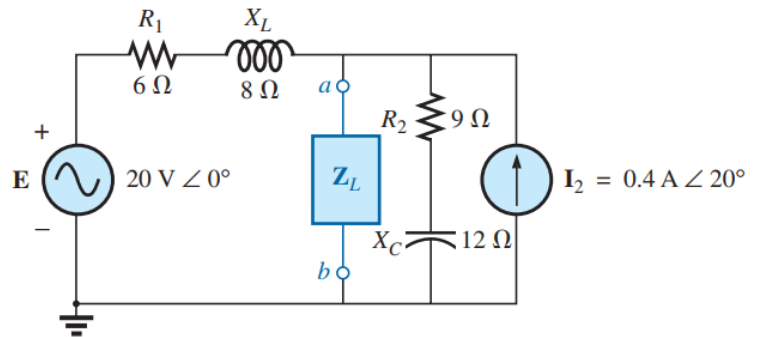


Figure 2