

Sultan Qaboos University
College of Engineering
Electrical and Electronics Engineering Department

Quiz #2 With Typical Answer

Course Code : Electric Circuits II
Course Code : ELEC3122
Semester : Summer 2000

Instructor : Dr. Adel Gastli
Date : Sat. 31-06-2000
Time : 20 min

Student name:

Marks

Student ID No.:

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Questions

Determine the Thevenin equivalent circuit for the network external to the 4kΩ inductive reactance of Fig. 1.

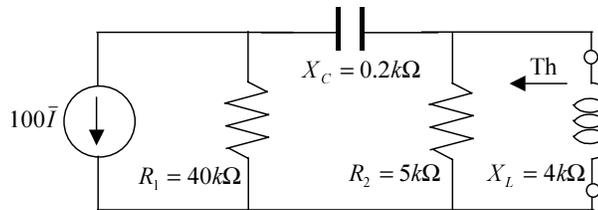
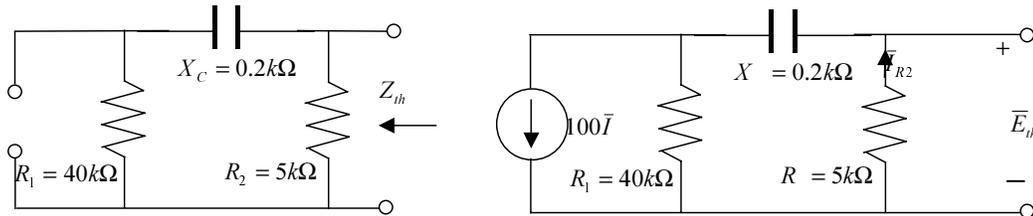


Fig. 1

Answers



$$\begin{aligned}
 Z_{th} &= \frac{(Z_1 + Z_2)Z_3}{Z_1 + Z_2 + Z_3} = \frac{(R_1 - jX_C)R_2}{R_1 + R_2 - jX_C} \\
 &= \frac{(40 - j0.2) \times 5 \times 10^3}{(45 - j0.2) \times 10^3} \\
 &= \frac{200[-0.286]}{45[-0.25]} \times 10^3 \\
 &= 4444[-0.536](\Omega)
 \end{aligned}$$

$$\bar{E}_{th} = -\bar{I}_{R_2} R_2 = -\frac{R_1 \times 100\bar{I}}{R_1 + R_2 - jX_C} \times R_2 = \frac{40 \times 10^3 \times 10^2 \times 5 \times 10^3}{45 \times 10^3 [-0.25]} \bar{I} = -444.44 \times 10^3 \bar{I} [-0.25] \text{ (V)}$$