

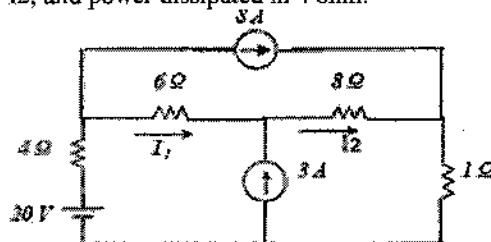


- 1- All the questions according to ILOs: a1, a3, a4, a8, a14, a17, b.15, c19.
- 2- Number of pages :2 No. of questions : 4
- 3- The weight of each problem is indicated.
- 4- This a closed book exam.
- 5- Clear, systematic answers and solutions are required in general, marks will not be assigned for answers and solutions that require unreasonable (in the opinion of the instructor) effort to decipher.
- 6- Ask for clarification if any question statement is not clear to you.
- 7- Attempts in all questions.
- 8- The exam will be marked out of 45.

Q1

Use the mesh current method to find I_1 , I_2 , and power dissipated in 4 ohm.

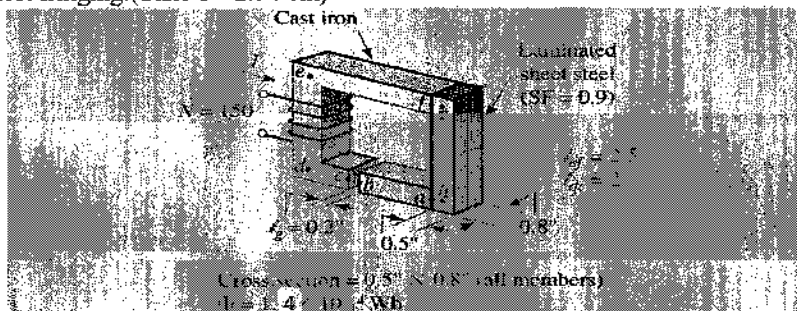
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Q2

The laminated sheet steel section in the figure has a stacking factor 0.92. Compute the current required to establish a flux $\phi = 1.4 \times 10^{-4}$ Wb. Neglect fringing. (Take $\mu = 2.54$ cm)

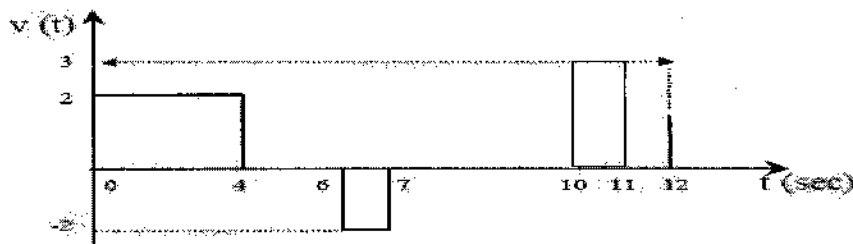
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Q3

Find the effective value of the waveform shown in the following figure and the power dissipation through 5 Ω resistance.

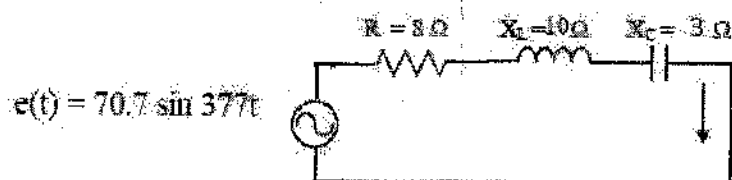
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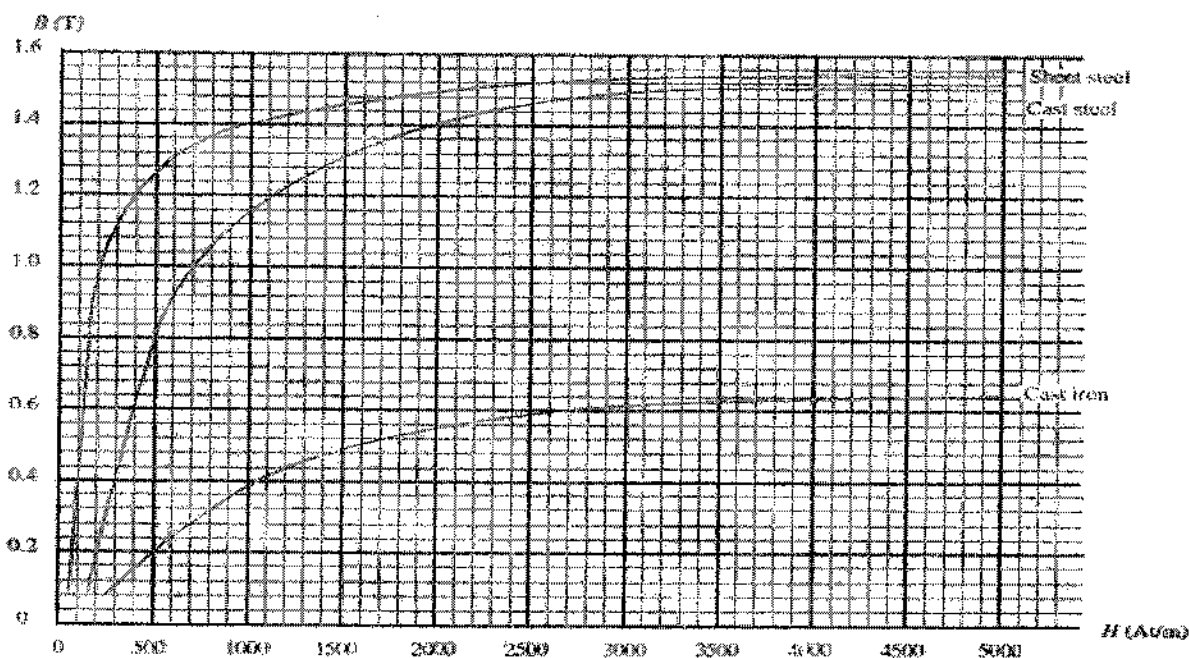
Q4

For the circuit shown below:

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- Find the total impedance Z in polar form.
- Draw the impedance diagram.
- Find the value of C in μF and the value of L in henry.
- Find the current I and the voltages V_R , V_L and V_C in polar form.
- Draw the phasor diagram of voltages V_R , V_L and V_C and the current I .
- Verify Kirchhoff's voltage law around the closed loop.
- Find the average power delivered to the circuit.
- Find the power factor of the circuit and indicate whether it is leading or lagging.
- Find the sinusoidal expressions for the voltages and current.
- Plot the waveforms for the voltages and current on the same set of axes.
- Find the capacitance needed to correct power factor to 0.98 and where its position.



End of Exam Questions (Electric Part)

Good Luck

Dr. Fathalla selim and committee