**EEE 322 PRACTICE QUESTIONS**

1. Determine the source current and the input impedance for the magnetically-coupled coils below:

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1. For the second-order passive lowpass filter circuit below, given *R*1 = 2 Ω, *R*2 = 5 Ω, *C*1 = 0.1 F, and *C*2 = 0.2 F, obtain the transfer function $H\left(s\right)=V\_{out}/V\_{in}$



1. Determine the mesh currents i1, i2, and i3 in the circuitbelow:



1. Two coils L1, L2, connected in series-aiding fashion have a total inductance of 250 mH. When connected in a series-opposing configuration, the coils have a total inductance of 150 mH. If the inductance of one coil (L1) is three times the other,
2. Find L1, L2 and *M.*
3. What is the coupling coefficient?
4. Design a series RLC circuit with B = 20 rad/s and $ω\_{o}$=1krad/s. Find the quality factor of the circuit for R = 10 Ω.
5. For the circuit below, obtain the transfer function$ V\_{O}(ω)/V\_{i}(ω)$. What type of filter is represented by the circuit; determine the corner frequency? Take *R*1 = 100 Ω = *R*2, *L* = 2 mH.



1. A parallel RLC circuit has R = 5k Ω, L = 8 mH, and C = 60 µF. Determine:
2. the resonant frequency
3. the bandwidth
4. the quality factor
5. In an electronic device, a series circuit is employed that has a resistance of 100 Ω, a capacitive reactance of 5 k Ω, and an inductive reactance of 300 Ω when used at 2 MHz. Find:
6. the resonant frequency and,
7. the bandwidth of the circuit.
8. Find the voltage $v\_{o}$across the 4-Ω resistor in the circuit below:



1. A series RLC circuit has resistance, R = 12 Ω and inductance, L = 60 mH, calculate:
2. the value of C that will produce a quality factor of 50
3. ω1, ω2, and B
4. the average power dissipated at ω = ω0, ω1, and ω2. Take Vm = 60V
5. A radio receiver has an output resistance of 300 Ω. When connected directly to an antenna system with a characteristic impedance of 75 Ω, an impedance mismatch occurs. By inserting an impedance-matching transformer ahead of the receiver, maximum power can be realized. Calculate the required turns ratio.
6. Design a series RLC circuit with B = 20 rad/s and $ω\_{o}$=1krad/s. Find the quality factor of the circuit for R = 10 Ω.
7. For the circuit below, obtain the transfer function$ V\_{O}(ω)/V\_{i}(ω)$. What type of filter is represented by the circuit; determine the corner frequency? Take *R*1 = 100 Ω = *R*2, *L* = 2 mH.



1. A parallel RLC circuit has R = 5k Ω, L = 8 mH, and C = 60 µF. Determine:
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6. the resonant frequency and,
7. the bandwidth of the circuit.
8. Obtain the mesh-current equations for the circuit below:



1. Find the voltage, Vo across the output resistor in the circuit below:

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