**DAILY ASSESSMENT FORMAT**

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| **Date:** | **05-6-2020** | **Name:** | **Archana H N** |
| **Course:** | **Network analysis** | **USN:** | **4AL18EC007** |
| **Topic:** | **1.Online open source circuit simulation**  **Series RLC, parallel RLC, RL AND RC series circuits frequency response** | **Semester & Section:** | **4th sem**  **A section** |
| **Github Repository:** | **Archana-course** |  |  |

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| **FORENOON SESSION DETAILS** |
| **Image of session** |
| **Report – Report can be typed or hand written for up to two pages.**  **Series Resonance Summary**  **You may have noticed that during the analysis of series resonance circuits in this tutorial, we looked at bandwidth, upper and lower frequencies, -3dB points and quality or Q-factor. All these are terms used in designing and building of Band Pass Filters (BPF) and indeed, resonance circuits are used in 3-element mains filter designs to pass all frequencies within the “passband” range while rejecting all others.**  **However, the main aim of this tutorial is to analyse and understand the concept of how Series Resonance occurs in passive RLC series circuits. Their use in RLC filter networks and designs is outside the scope of this particular tutorial, and so will not be looked at here, sorry.**  **For resonance to occur in any circuit it must have at least one inductor and one capacitor.**  **Resonance is the result of oscillations in a circuit as stored energy is passed from the inductor to the capacitor.**  **Resonance occurs when XL = XC and the imaginary part of the transfer function is zero.**  **At resonance the impedance of the circuit is equal to the resistance value as Z = R.**  **At low frequencies the series circuit is capacitive as: XC > XL, this gives the circuit a leading power factor.**  **At high frequencies the series circuit is inductive as: XL > XC, this gives the circuit a lagging power factor.**  **The high value of current at resonance produces very high values of voltage across the inductor and capacitor.**  **Series resonance circuits are useful for constructing highly frequency selective filters. However, its high current and very high component voltage values can cause damage to the circuit.**  **The most prominent feature of the frequency response of a resonant circuit is a sharp resonant peak in its amplitude characteristics.**  **Because impedance is minimum and current is maximum, series resonance circuits are also called Acceptor Circuits.**  **Parallel RLC Circuit Summary**  **In a parallel RLC circuit containing a resistor, an inductor and a capacitor the circuit current IS is the phasor sum made up of three components, IR, IL and IC with the supply voltage common to all three. Since the supply voltage is common to all three components it is used as the horizontal reference when constructing a current triangle.**  **Parallel RLC networks can be analysed using vector diagrams just the same as with series RLC circuits. However, the analysis of parallel RLC circuits is a little more mathematically difficult than for series RLC circuits when it contains two or more current branches. So an AC parallel circuit can be easily analysed using the reciprocal of impedance called Admittance.**  **Admittance is the reciprocal of impedance given the symbol, Y. Like impedance, it is a complex quantity consisting of a real part and an imaginary part. The real part is the reciprocal of resistance and is called Conductance, symbol Y while the imaginary part is the reciprocal of reactance and is called Susceptance, symbol B and expressed in complex form as: Y = G + jB with the duality between the two complex impedance’s being defined as:**  **Series Circuit Parallel Circuit**  **Voltage, (V) Current, (I)**  **Resistance, (R) Conductance, (G)**  **Reactance, (X) Susceptance, (B)**  **Impedance, (Z) Admittance, (Y)**  **As susceptance is the reciprocal of reactance, in an inductive circuit, inductive susceptance, BL will be negative in value and in a capacitive circuit, capacitive susceptance, BC will be positive in value. The exact opposite to XL and XC respectively.**  **We have seen so far that series and parallel RLC circuits contain both capacitive reactance and inductive reactance within the same circuit. If we vary the frequency across these circuits there must become a point where the capacitive reactance value equals that of the inductive reactance and therefore, XC = XL.**  **The frequency point at which this occurs is called resonance and in the next tutorial we will look at series resonance and how its presence alters the characteristics of the circuit.**  **RL-RC circuit**  **In this experiment, we have demonstrated the time dependent response (exponential turning on and off) in RC or RL circuits, and how changing the resistance affects the time constant. We also demonstrated the oscillatory response in an LC circuit.**  **RC, RL and LC circuits are essential building blocks in many circuit applications. For example, RC and RL circuits are commonly used as filters (taking advantage of the fact that capacitors tend to pass high frequency signals but block low frequency signals, while the opposite is true for inductors). They are also useful for electrical signal processing, for example, taking the derivative or integral of an electrical signal. The LC circuit is a simple example of an electrical "oscillator" or resonance circuit and is a common component in circuits used for amplifiers, radio tuning, etc.** |

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| **Date:** | **05-6-2020** | **Name:** | **Archana H N** |
| **Course:** | **Python** | **USN:** | **4al18ec007** |
| **Topic:** | **1.Application 10: Project Exercise on Building a Geocoder Web Service** | **Semester & Section:** | **4th sem A section** |
| **AFTERNOON SESSION DETAILS** | | | |
| **Image of session** | | | |
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