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17/ENG04/005

ELECTRICAL/ELCTRONICS ENGINEERING

ELECTRICAL CIRUIT THEORY II

### **ASSIGNMENT ANSWER**

Parallel Resonance Circuit:

Parallel Resonance occurs when the supply frequency creates zero phase difference between the supply voltage and current producing a resistive circuit.

Parallel resonance circuit and series resonance circuit are alike in many ways. They are both 3-element networks that contain two reactive components making them a second- order circuit, both are influenced by variations in the supply frequency and both have a frequency point where their two reactive components cancel each other out influencing the characteristics of the circuit. Both circuits have a resonant frequency point.

The difference between the circuits is that, Parallel resonance circuit is influenced by the currents flowing through each parallel branch within the parallel LC tank circuit is a combination of L and C that is used in filter networks to either select or reject AC frequencies.

Series Resonance Circuit:

Series resonance occurs in a series circuit when the supply frequency causes the voltage across L and C to be equal and opposite in phase.

In a series RLC circuit there becomes a frequency point were the inductive reactance of the inductor becomes equal in value to the capacitive reactance of the capacitor. Mathematically speaking,  $X_L = X_C$ . The point at which this occurs is known as the Resonant Frequency point, (fr) of the circuit, and as we analyse a series RLC circuit this resonance

frequency produces a Series Resonance.

Series Resonance circuits are one of the most important circuits used in electrical and electronics circuits. They could be found in forms like AC mains filters, noise filters, and also in radio and television tuning circuits producing a very selective tuning circuit for the receiving of the different frequency channels.