NETWORK ANALYSIS AND SYNTHESIS

Unit – V
(a) Network Synthesis

- Positive real function; definition and properties,
- Properties of LC, RC and RL driving point functions,
- Synthesis of LC, RC and RL driving point admittance functions
- Foster and Cauer first and second forms.

Properties of L-C immitance

- Impedence or admittance is the ratio of odd to even or even to odd polynomials.
- The poles and zeros are simple and lie on the jw axis.
- The poles and zeros interlace on the jw axis.
- The highest powers of numerator and denominator must differ by unity; the lowest powers also differ by unity.
- There must be either a zero or a pole at the origin and infinity.

Properties of R-C impedences

- Poles and zeros lie on the negative real axis, and they alternate.
- The singularity nearest to (or at) the origin must be a pole whereas the singularity nearest to (or at) $\sigma=-\infty$ must be zero.
- The residues of the poles must be real and positive.

Properties of R-L impedences

- Poles and zeros of an R-L impedance or R-C admittance are located on the negative real axis, and they alternate.
- The singularity nearest to (or at) the origin is zero. The singuarity nearest to (or at) $s = -\infty$ must be a pole.
- The residues of the poles must be real and negative.

Synthesis of certain R-L-C functions

- When, positive real function is given, and it is found that the function is not synthesizable by using two kinds of elements only, R-L-C driving-point functions can be synthesized.
- A continued fraction expansion or a partial fraction expansion be tried first.

THANKS….

Queries Please…