UNIT-4

(Lecture-2)

Transfer Functions

Transfer Functions

The transfer formation is used to describe networks which have at least two ports. In general, the transfer function relates the transform of a quantity at one port to the transform of another quantity at another port. Thus transfer functions have the following possible forms

I. The ratio of one voltage to another current or one current to another voltage; Z(s) or Y(s)
II. The ratio of one voltage to another voltage, or the voltage transfer function; G(s)
III. The ratio of one current to another current or the current transfer function; α(s)

Transfer Functions

In terms of the two port network , the output quantities are $V_2(s)$ and $I_2(s)$ and the input quantities are $V_1(s)$ and $I_1(s)$. Using these quantities there are only four basic transfer function for the two port networks and these are given as

1. Transfer impedance function; $Z_{21}(s) = \frac{V_2(s)}{I_1(s)}$
2. Transfer admittance function; $Y_{21}(s) = \frac{I_2(s)}{V_1(s)}$
3. Voltage transfer function; $G_{21}(s) = \frac{V_2(s)}{V_1(s)}$
4. Current transfer function; $\alpha_{21}(s) = \frac{I_2(s)}{I_1(s)}$

Transfer Functions

The ratio of an input quantity to an output quantity is termed as the 'Inverse transfer function' i.e.,

1. The inverse transfer impedance function; $Z_{12}(s) = \frac{V_1(s)}{I_2(s)}$
2. The inverse transfer admittance function; $Y_{12}(s) = \frac{I_1(s)}{V_2(s)}$
3. The inverse voltage transfer function; $G_{12}(s) = \frac{V_1(s)}{V_2(s)}$
4. The inverse current transfer function; $\alpha_{12}(s) = \frac{I_1(s)}{I_2(s)}$