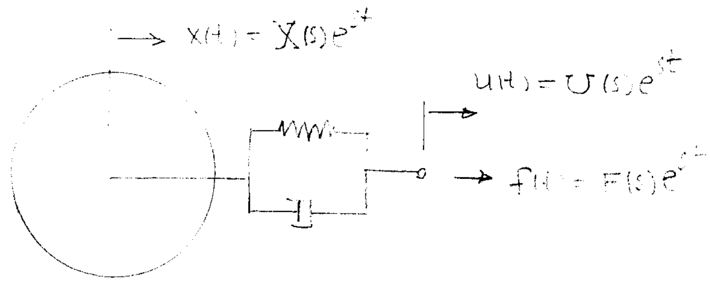

$$H(s) = \frac{X(s)}{U(s)} = \frac{cs + k}{\frac{3}{2}ms^2 + cs + k}$$

<u>Driving point impedance</u>

$$Z(s) \equiv \frac{sU(s)}{F(s)}$$

$$k(u - x) \leftarrow \quad \cdot \rightarrow f(t)$$
$$c(\dot{u} - \dot{x}) \leftarrow$$

Equilibrium requires

$$f(t) = k(u - x) + c(\dot{u} - \dot{x})$$

OR

$$F(s) = (k + cs)\left[U(s) - X(s)\right]$$

Hence

$$\frac{F(s)}{sU(s)} = \frac{k + cs}{s}\left[1 - \frac{X(s)}{U(s)}\right]$$

$$= \frac{k + cs}{s}\left[1 - \frac{cs + k}{\frac{3}{2}ms^2 + cs + k}\right]$$

$$= \frac{k + cs}{s}\left[\frac{\frac{3}{2}ms^2}{\frac{3}{2}ms^2 + cs + k}\right]$$

$$Z(s) = \frac{sU(s)}{F(s)} = \frac{\frac{3}{2}ms^2 + cs + k}{\frac{3}{2}ms(k + cs)}$$