Assignment

Control System

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Q1) Draw the inverse polar plot for a feed back system with as open loop transfer function

$$G(s)H(s) = \frac{K}{s(1+Ts)}$$

Ans) $$\frac{1}{G(s)H(s)} = \frac{s(1+Ts)}{K}$$

Therefore, the sinosuidal TF is

$$\frac{1}{G(j\omega)H(j\omega)} = \frac{j\omega(1+Tj\omega)}{K} = \frac{-\omega^2 T + j\omega}{K}$$

At $\omega = -\infty$

$$\frac{1}{G(j\omega)H(j\omega)} = -\infty - j\infty$$

At $\omega = 0^-$ $\quad \frac{1}{G(j\omega)H(j\omega)} = -0 - j0$

At $\omega = 0^+$ $\quad \frac{1}{G(j\omega)H(j\omega)} = -0 + j0$

At $\omega = +\infty$ $\quad \frac{1}{G(j\omega)H(j\omega)} = -\infty + j\infty$