GATE 23 EE Q38

EE23BTECH11204 - Ashley Ann Benoy*

Question: Consider a lead compensator of the form

$$K(s) = \frac{1 + \frac{s}{a}}{1 + \frac{s}{\beta a}}, \quad \beta > 1, \quad a > 0$$

The frequency at which this compensator produces maximum phase lead is 4 rad/s. At this frequency, the gain amplification provided by the controller, assuming an asymptotic Bode-magnitude plot of $K(s)$, is 6 dB. The values of a and β, respectively, are

(A) $1, 16$ (B) $2, 4$ (C) $3, 5$ (D) $2.66, 2.25$