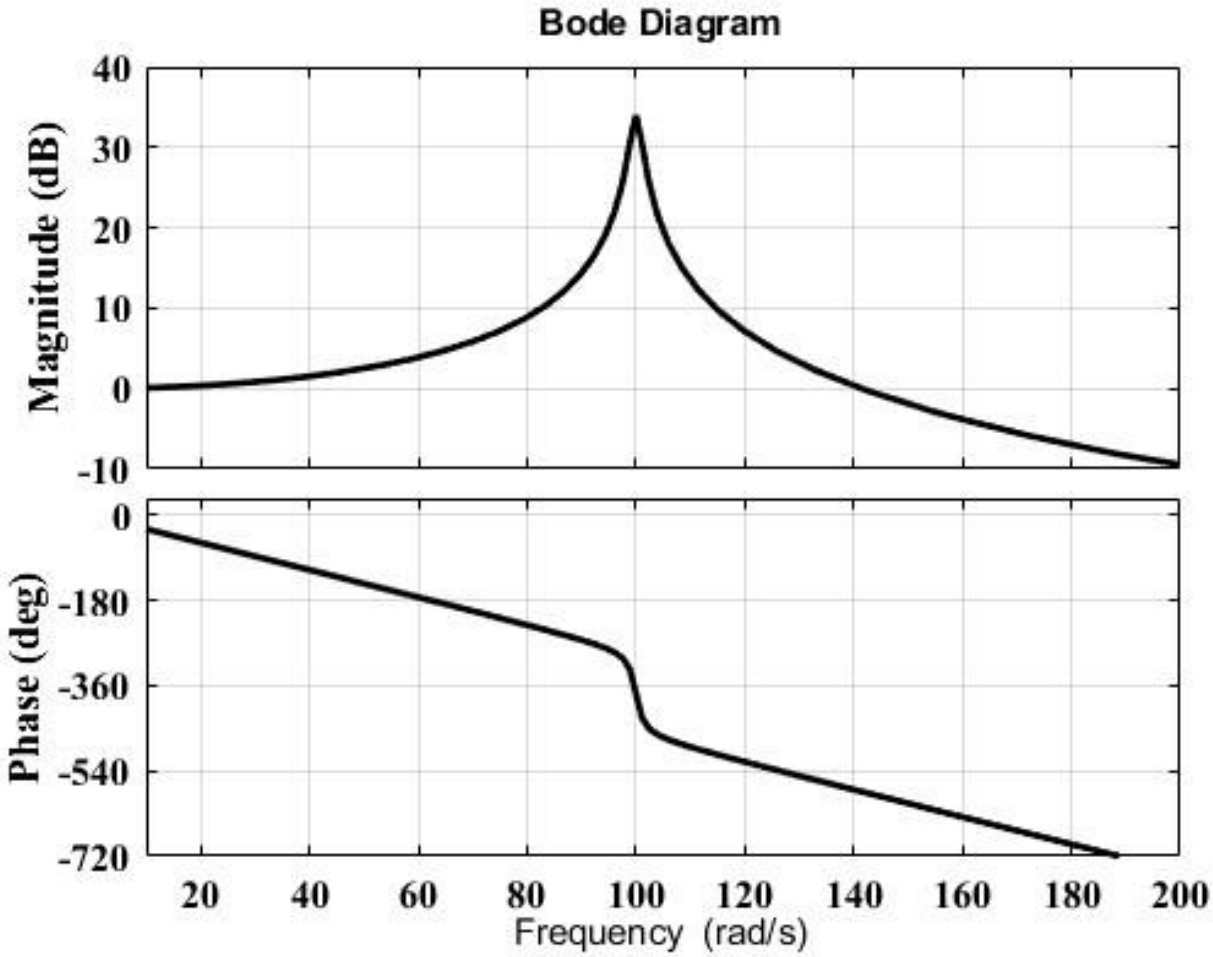
GATE IN 43

EE23BTECH11022 - G DILIP REDDY

Question:
The magnitude and phase plots shown in the figure match with the transfer- function



a) $\frac{10000}{s^2+2s+10000}$

b) $\frac{10000}{s^2+2s+10000}e^{-0.05s}$

c) $\frac{10000}{s^2+2s+10000}e^{-0.5\times10^{-12}s}$

d) $\frac{100}{s^2+2s+100}$

(GATE IN 2023)

Solution: Drawing bode plots for four options.
From the graphs , the answer is b

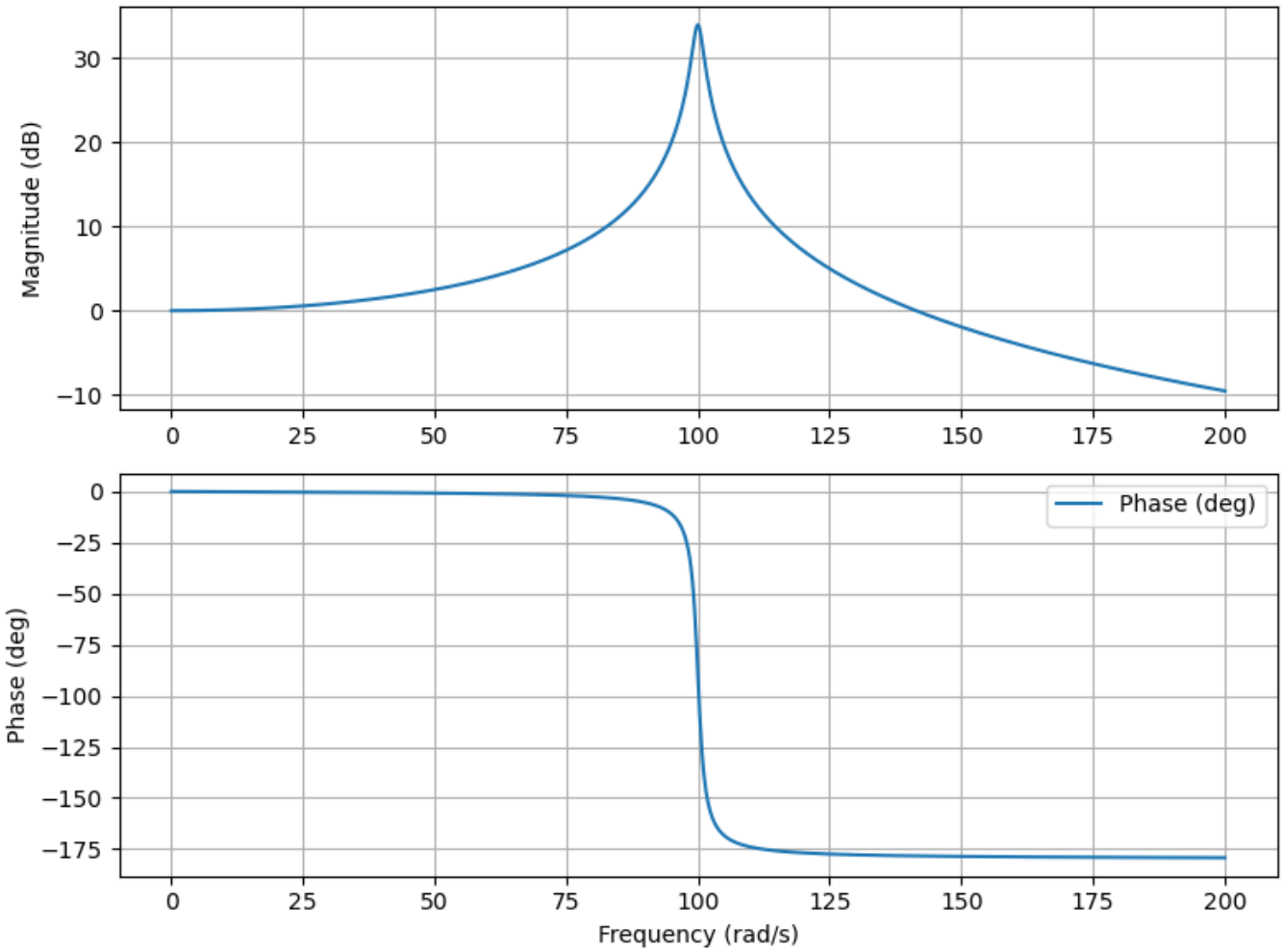


Fig. 1: Bode plot of a $\frac{10000}{s^2+2s+10000}$

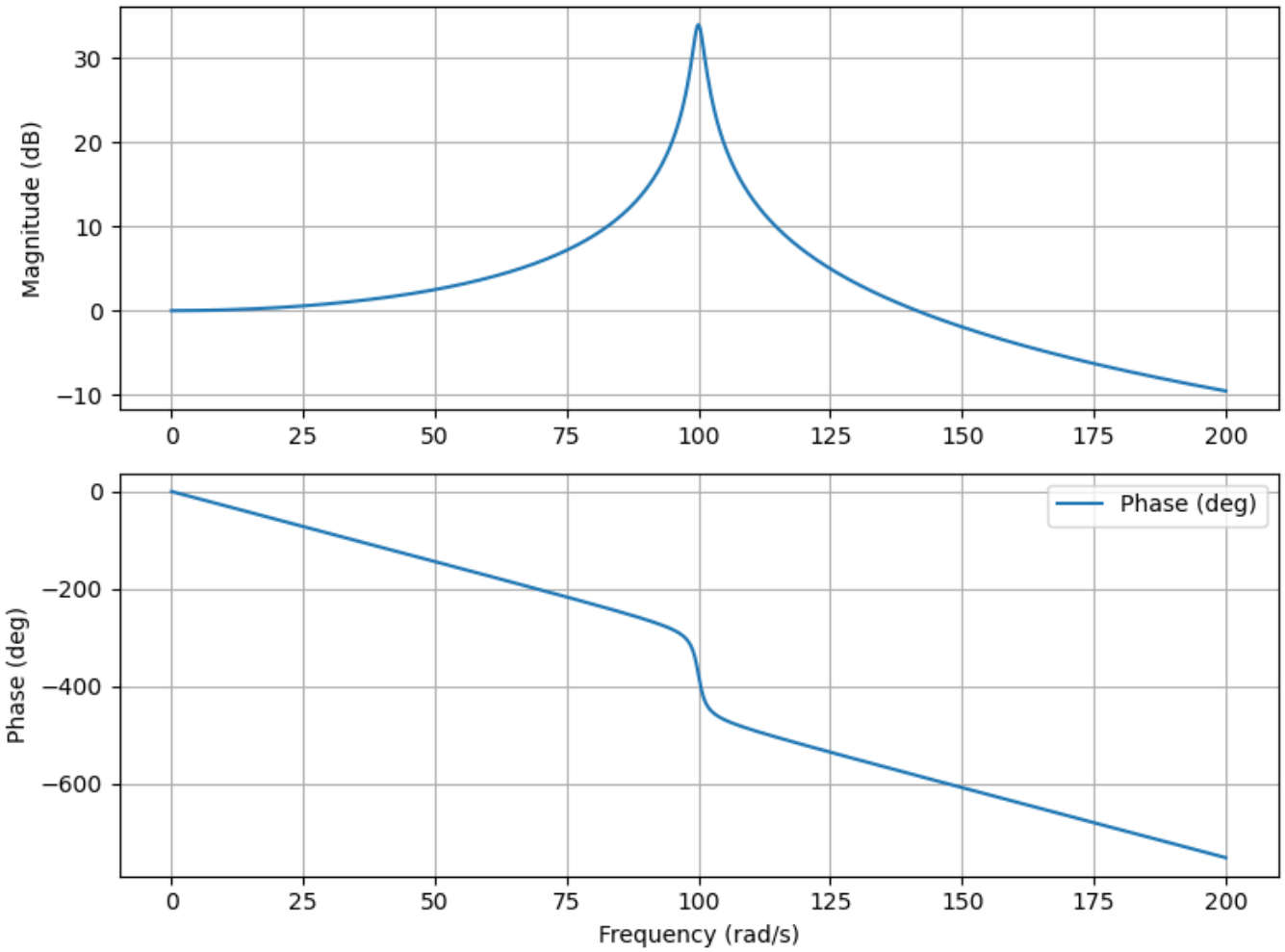


Fig. 2: Bode plot of b $\frac{10000e^{-0.05s}}{s^2+2s+10000}$

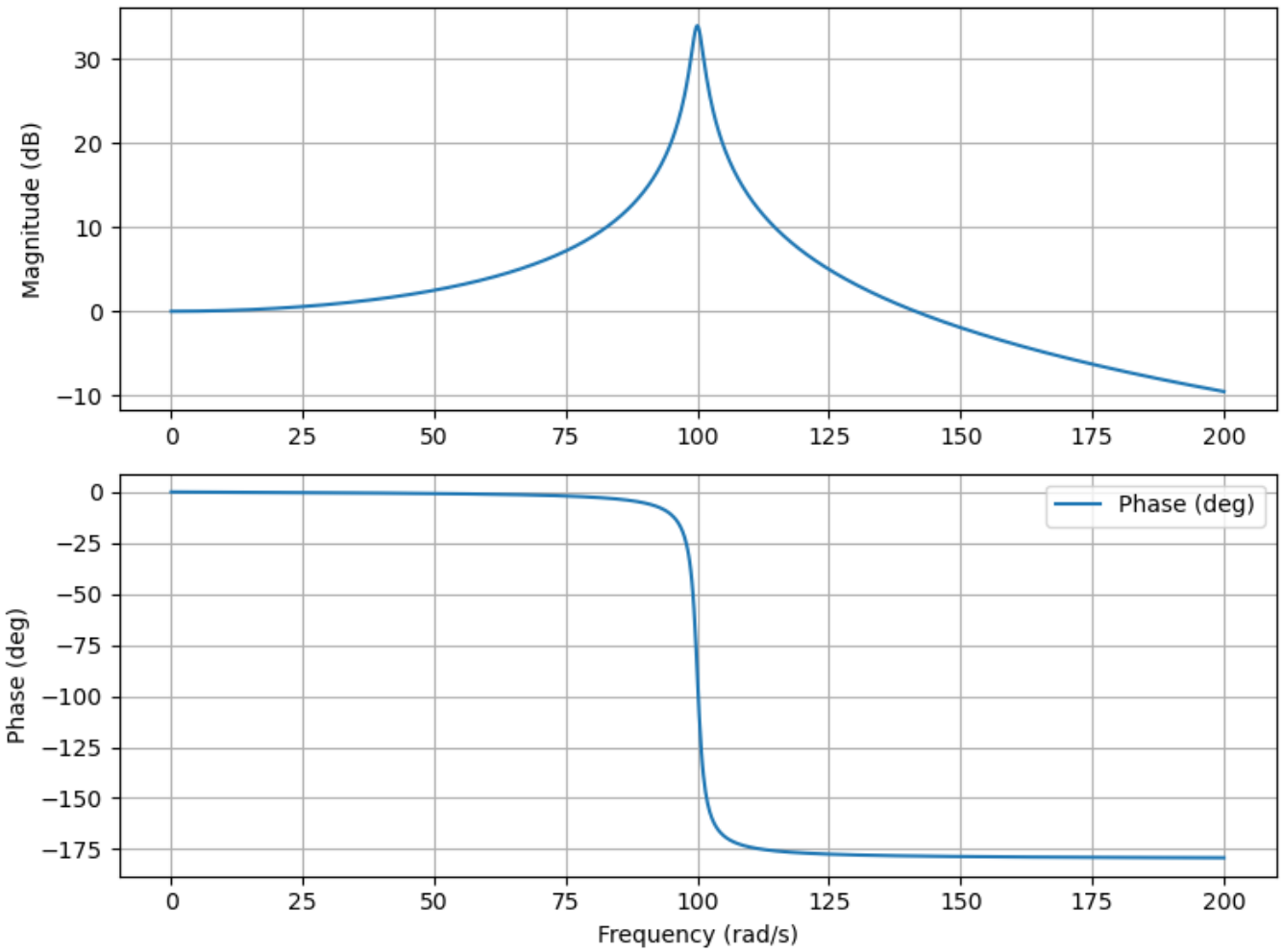


Fig. 3: Bode plot of c $\frac{10000e^{0.5\times10^{-12}s}}{s^2+2s+10000}$

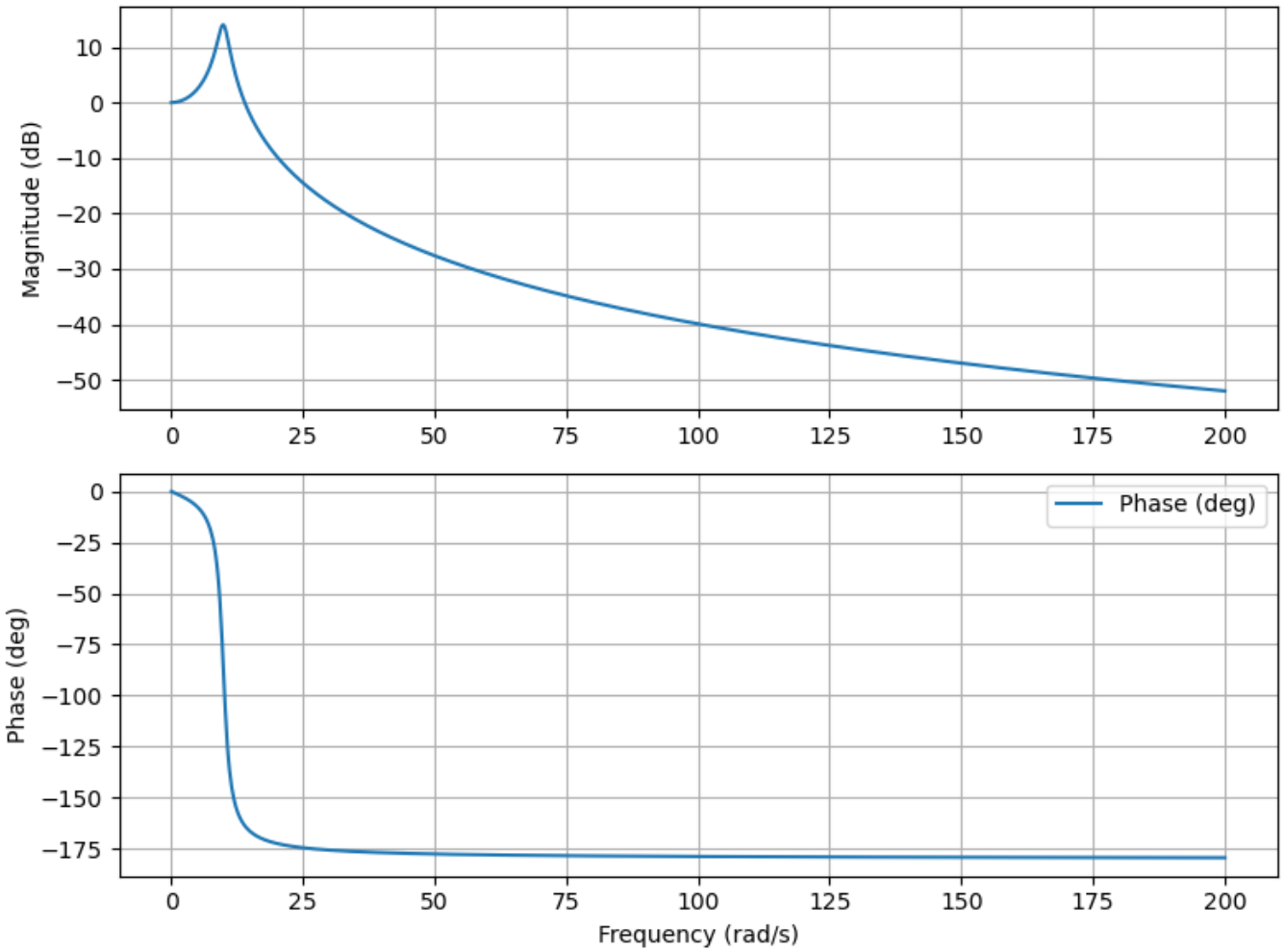


Fig. 4: Bode plot of d $\frac{100}{s^2+2s+100}$