KON317
OKS – II. KISA SINAV
ÇÖZÜMLERİ

a) $M_p = y_{maks} - y_{son} = 1{,}335 - 1 = 0{,}335$ } Verilen Eğriden

(y_{son} yada $C_{son} = 1$)

$T_s = 8$ [s]

$M_p = \underbrace{y_{son}}_{1} e^{-\pi\zeta/\sqrt{1-\zeta^2}}$ $\rightarrow$ $0{,}335 = e^{-\pi\zeta/\sqrt{1-\zeta^2}}$

$\Rightarrow \zeta = \dfrac{-\ln(0{,}335)}{\sqrt{\pi^2 + \ln^2(0{,}335)}}$

$\zeta = 0{,}3287$

$T_s = \dfrac{3}{\zeta\omega_n} \rightarrow \omega_n = \dfrac{3/T_s}{\zeta} = \dfrac{3/8}{0{,}3287} = \dfrac{0{,}375}{0{,}3287} = 1{,}1408$ [rad/s]

($2\zeta\omega_n = 2(3/8) = 0{,}75$) ($\omega_n^2 = 1{,}3015$)

$$T(s) = \frac{y(s)}{R(s)} = \frac{\omega_n^2}{s^2 + 2\zeta\omega_n s + \omega_n^2} = \frac{1{,}3015}{s^2 + 0{,}75\,s + 1{,}3015}$$

b) $$G_p(s) = \frac{\omega_n^2}{s(s + 2\zeta\omega_n)} = \frac{1{,}3015}{s(s + 0{,}75)}$$

(Ders Notlarına Bakınız.)

(yada $G_p(s) = \dfrac{T(s)}{1 - T(s)}$)