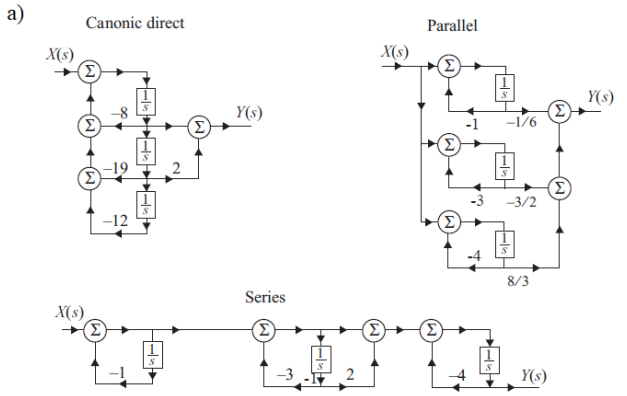
ENGR 3323: Signals and Systems

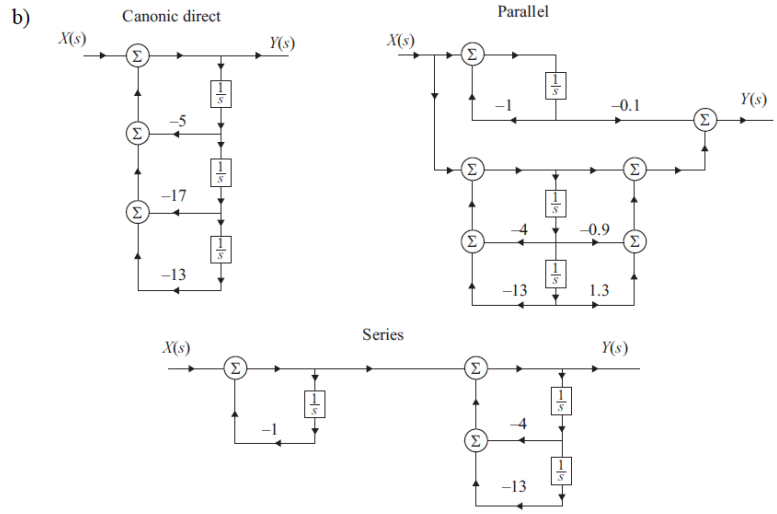
HW 7_Ch4 Answer Keys

Q1)

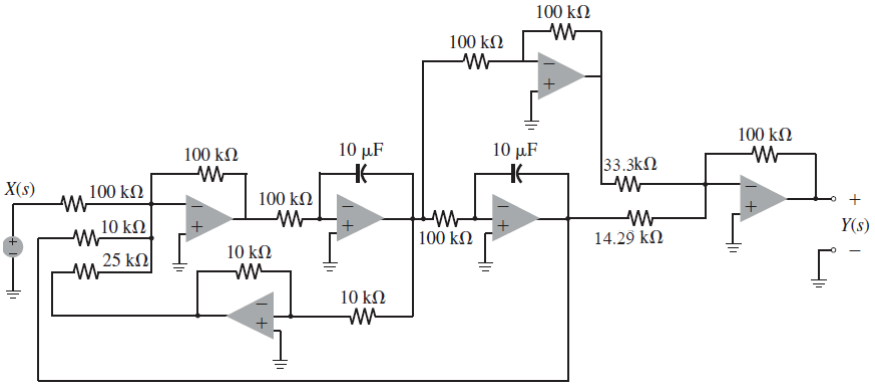
a)



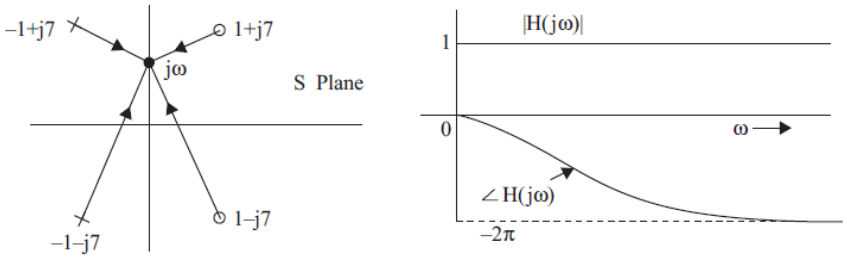
b)



Q2)



Q3)

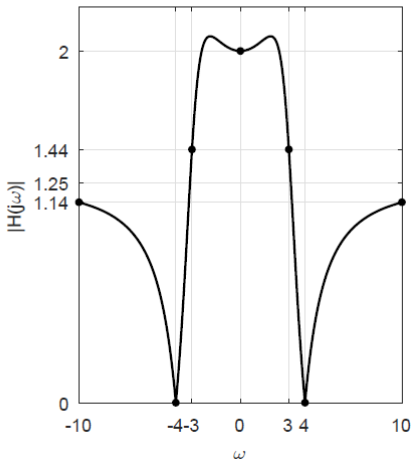


Q4)

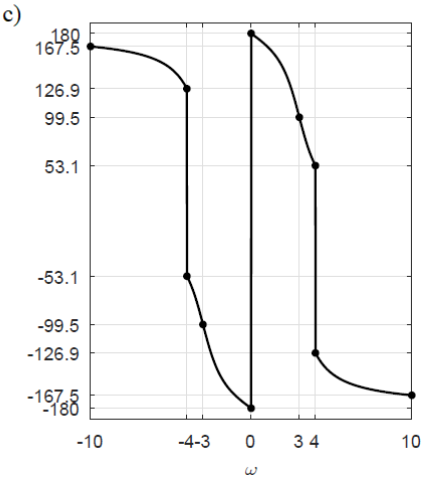
a) $k = -\frac{5}{4}$, $b_1 = 0$, $b_2 = 16$, $a_1 = 2$, and $a_2 = 10$

d) $y(t) = 6 + 1.44\cos(3t + 159.5°)$

b)



c)



Q5) The smaller the a, the gain will be higher at the vicinity of ω = 10.

$$H(s) = \frac{s}{(s + a + j10)(s + a - j10)} = \frac{s}{s^2 + 2as + (100 + a^2)}$$

Q6)

$$H_c(s) = \frac{e^{-sT}(1 + ae^{-s\tau})}{1 + ae^{-s\tau}} = e^{-sT}$$