

Homework # 5 Solution (Exercises 8.1, 3 & 5)

B-8-1. The closed-loop transfer function is

$$\frac{C(s)}{R(s)} = \frac{10}{s+11}$$

The steady-state outputs of the system when it is subjected to the given inputs are

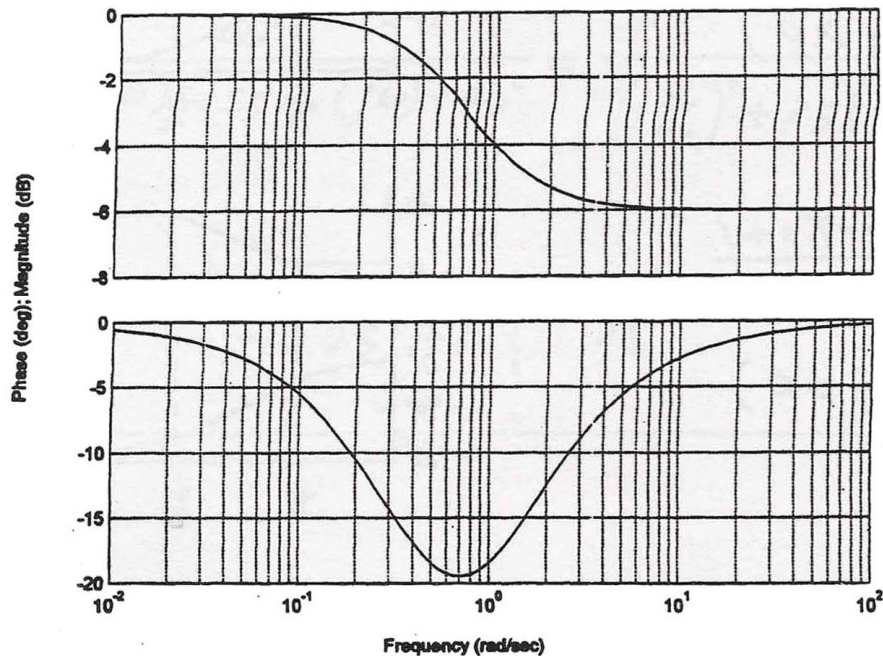
(a) $C_{ss}(t) = 0.905 \sin(t + 24.8^\circ)$

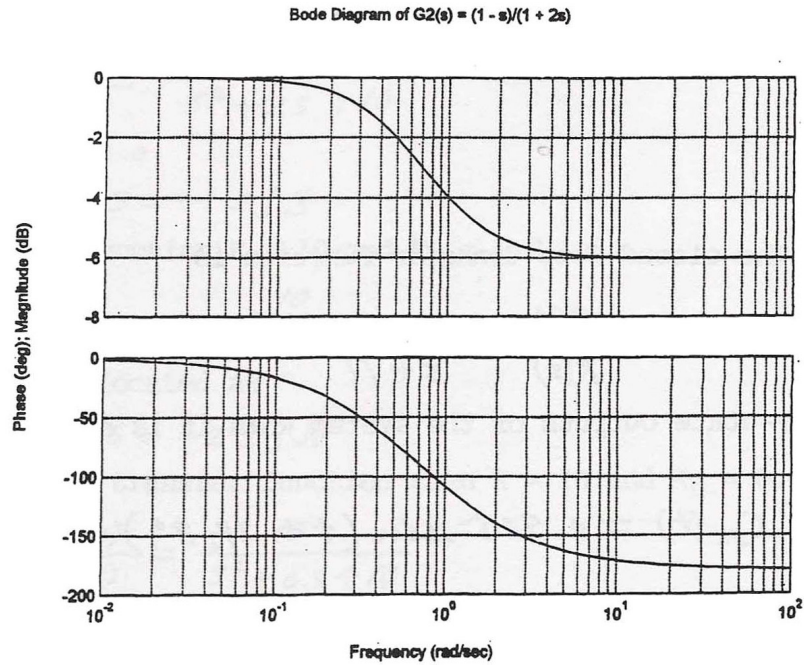
(b) $C_{ss}(t) = 1.79 \cos(2t - 55.3^\circ)$

(c) $C_{ss}(t) = 0.905 \sin(t + 24.8^\circ) - 1.79 \cos(2t - 55.3^\circ)$

8-3.

Bode Diagram of $G1(s) = (1+s)/(1+2s)$





B-8-5. The following MATLAB program produces the Bode diagram shown below.

```

% ***** Bode diagram *****

num = [0 10 4 10];
den = [1 0.8 9 0];
bode(num,den)
title('Bode Diagram of G(s) = 10(s^2+0.4s+1)/[s(s^2+0.8s+9)]')
    
```

