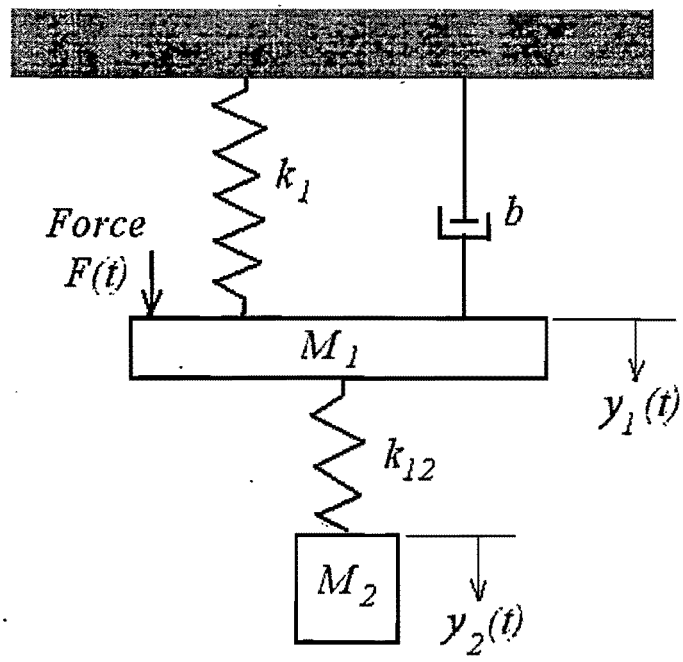
國立雲林科技大學
100學年度碩士班暨碩士在職專班招生考試試題

系所：機械系
科目：自動控制(1)

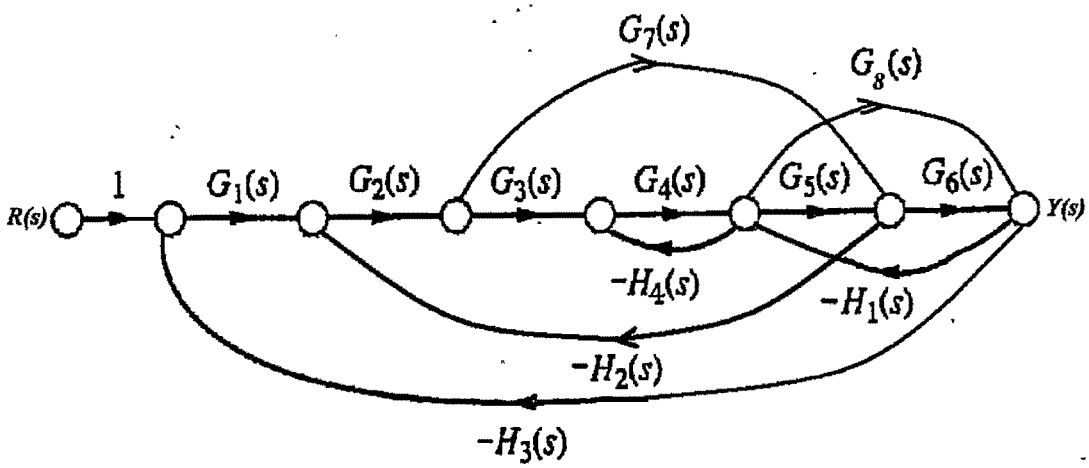
1. For the mechanical system shown below.

(a) Obtain the differential equations describing the system. (10%)

(b) Using Cramer's rule to solve the transfer function $G(s)=Y_1(s)/F(s)$. (15%)



2. For the signal-flow-graph shown below, find the transfer function $T(s)=Y(s)/R(s)$. (25%)



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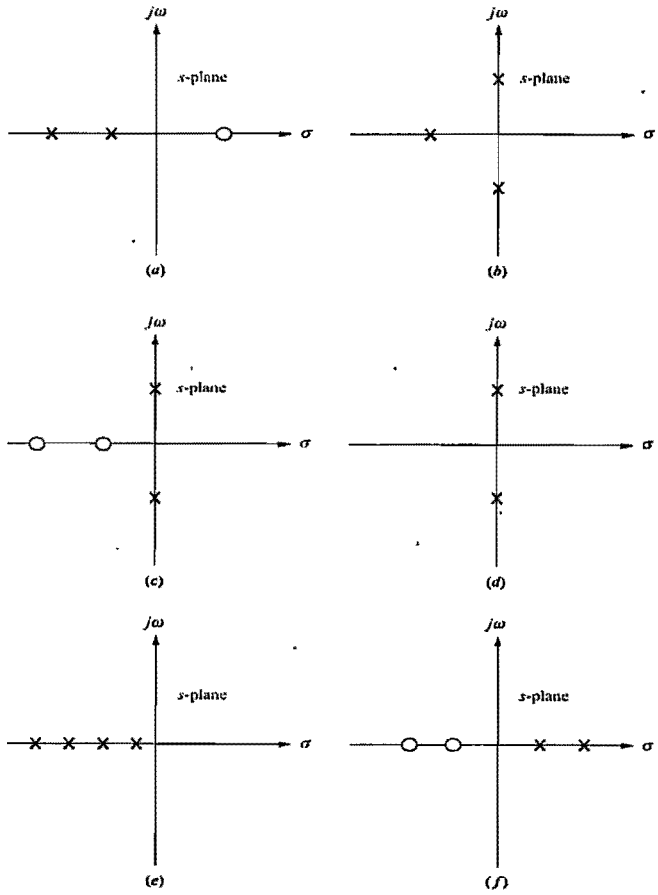
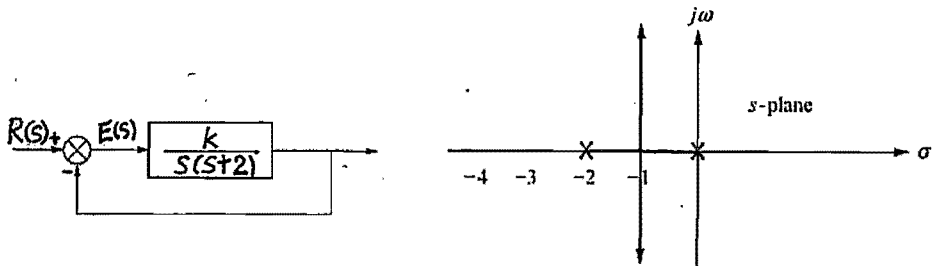
3. Sketch the general shape of the root locus for each of the plots shown below.(20%)



4. 系統及其根軌跡如下圖



a. 希望系統的 closed-loop poles $S=-1\pm j\sqrt{3}$ 求系統之 k=? e_{ss}=? (10%) $(R(s)=\frac{1}{s^2})$

b. 試設計補償器 $G_c(s)$，使補償後系統的穩態誤差 e_{ss} 降低 10 倍，並儘量維持系統的暫態反應。試求系統補償後的 closed-loop poles S=？系統補償後的 k=? (20%)