

國立臺北科技大學九十九學年度碩士班招生考試

系所組別：2112、2130 電機工程系碩士班甲、丙組

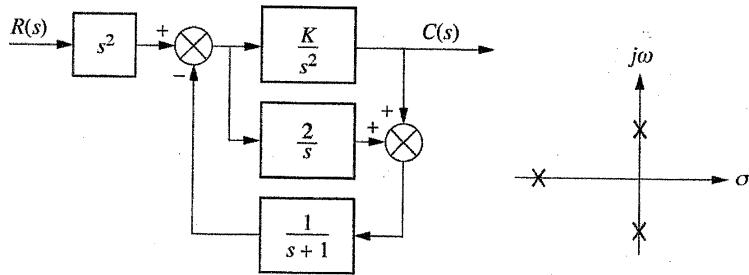
第一節 控制系統 試題 (甲組選考)

第一頁 共一頁

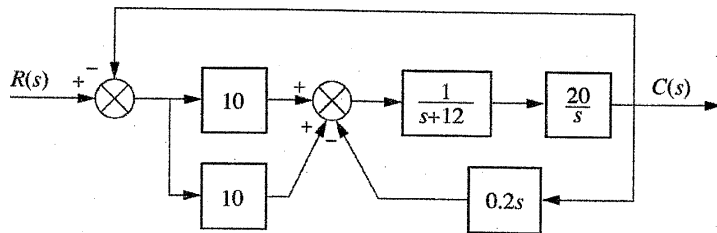
注意事項：

1. 本試題共 5 題，配分共 100 分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

1. (15%) Find the K value in the following system that will place the closed-loop poles as shown.

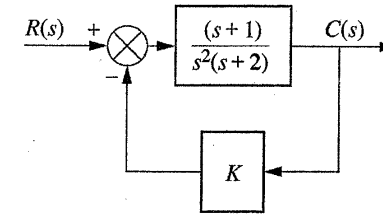


2. For the system in the figure,



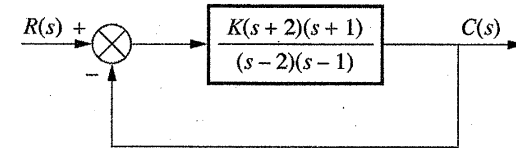
- (a) (10%) Find the transfer function $T(s) = C(s)/R(s)$.
- (b) Find the percent overshoot (5%), settling time (5%), and damped frequency of oscillation (5%).

3. For the system in the figure,



- (a) (5%) According to the steady-state error concept, find the system type.
- (b) (10%) Find the K value to yield 0.1% error in the steady state.
- (c) (5%) Use the Routh table to check the stability.

4. For the system in the figure,



- (a) (10%) Sketch the root locus.
- (b) (10%) Find the K value to yield a stable system with critically damped 2nd-order poles.
- (c) (5%) Find the K value to yield a stable system with a pair of 2nd-order poles that have a damping ratio of 0.707.

5. (15%) For the system in the figure, what relationship exists between b_1 and b_2 to make the system not completely controllable?

