

國立臺北科技大學 109 學年度碩士班招生考試

系所組別：2132 電機工程系碩士班丙組

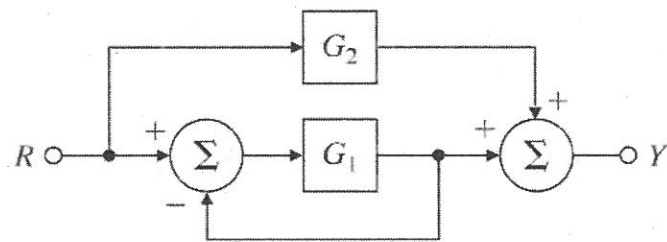
第一節 控制系統 試題 (選考)

第 1 頁 共 1 頁

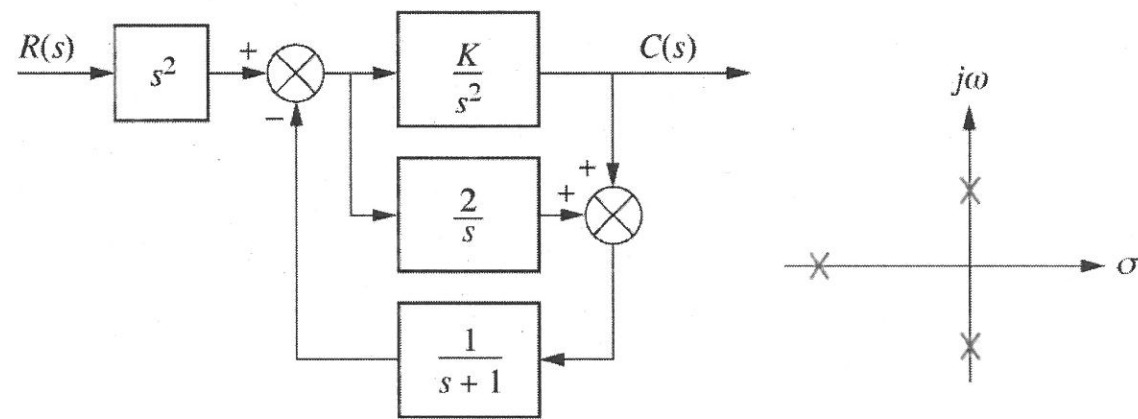
注意事項：

1. 本試題共 5 題，每題 20 分，共 100 分。
2. 不必抄題，作答時請將試題題號及答案依照順序寫在答案卷上。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

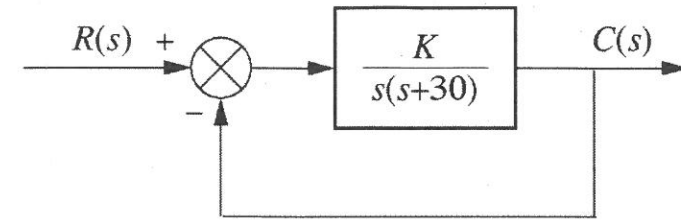
1. Find the transfer function $T(s) = Y(s)/R(s)$ for the following system (20%).



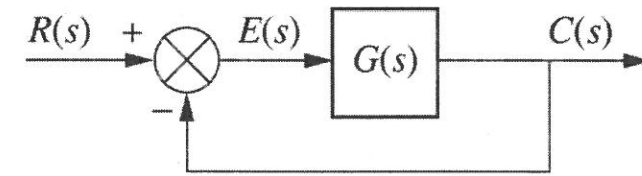
2. Design the K value in the following system that will place the closed-loop poles as shown (20%).



3. Design the K value that yields 20% overshoot for a step input in the following system (20%).



4. For a unity feedback system with the forward transfer function $G(s) = \frac{K(s+12)}{(s+14)(s+18)}$, design the K value to yield a 10% error in the steady state (20%).



5. For a unity feedback system with $G(s) = \frac{K}{s(s+5)(s+15)}$, design a PD controller to reduce the settling time by a factor of 4 while continuing to operate the system with 20% overshoot (20%).

